IN TWO MINDS ABOUT SCREENING:

AN INVESTIGATION OF CERVICAL CANCER PREVENTION AMONG IRISH WOMEN

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LIST OF ACRONYMS AND ABBREVIATIONS

AFI	age at first intercourse
ANOVA	Analysis of Variance
ASC-H	atypical squamous cells - cannot exclude high-grade
ASC-US	atypical squamous cells of undetermined significance
AV	attitude video group
CIN	cervical intraepithelial neoplasia
CINAHL	Cumulative Index of Nursing and Allied Health Literature
CINV	chemotherapy-induced nausea and vomiting
CIS	carcinoma in situ
CRD	Centre for Reviews and Dissemination
CSO	Central Statistics Office
CVR	covariance ratio
EU	European Union
EVT	expectancy-value theories
FRE	Flesch Reading Ease
FOBt	faecal occult blood test
GHM	general health motivation
GL	Flesch-Kincaid Grade Level
GP	general practioner
HAPA	Health Action Process Approach
HBM	Health Belief Model
HIQA	Health Information Quality Authority
HLoC	Health Locus of Control
HPV	human papillomavirus
HSE	Health Service Executive
HSIL	high-grade squamous intraepithelial lesions
IARC	International Agency for Research on Cancer
ICBT	intra-cavity Brachytherapy
ICSP	Irish Cervical Screening Programme
IFPA	Irish Family Planning Association
IUD	intra-uterine device
IV	information video group
K-S test	Kolmogorov-Smirnov test of normality
LLETZ	large loop excision of the transformation zone
LoC	Locus of Control
LSIL	low-grade squamous intraepithelial lesion
NACCCMA	Neoadjuvant Chemotherapy of Cervical Cancer Meta-analysis Collaboration
NAD	no abnormalities detected
NCRI	National Cancer Registry Ireland
NCSP	National Cervical Screening Programme
NCSS	National Cancer Screening Service

NICE	National Institute of Health and Clinical Excellence
NT	no-treatment group
OECD	Organisation for Economic Co-operation and Development
OQAQ	Overview Quality Assessment Questionnaire
Pap test	Papanicolaou's smear test
PBC	perceived behavioural control
PMT	Protection Motivation Theory
PPV	Positive Predictive Value
QUROM	Quality of Reporting of Meta-Analyses
R	reading group
SCT	Social Cognitive Theory
SES	socio-economic status
SIL	squamous intraepithelial lesion
STI	sexually transmitted illness
THB	theories of health behaviour
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
WHO	World Health Organisation

Declaration

I confirm that this thesis is my own work and has not been submitted for another degree, either at University College Cork or elsewhere.

Signed

Marie Kotzur

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Abstract

Cervical cancer is a debilitating disease. It is the second most common female cancer worldwide. However, pre-cancerous cell changes can be identified and treated to prevent the development of cervical cancer. Cervical screening programmes can reduce the incidence of cervical cancer by up to 80 percent if the invited women participate. In 2008 the Republic of Ireland introduced the National Cervical Screening Programme (NCSP) which uses Papanicolaous' (Pap) smear test to diagnose pre-cancerous cell changes. This research seeks to identify the predictors of cervical screening attendance in Ireland following the introduction of the NCSP.

Previous Irish research focused on the predictors of screening participation prior to the nationwide rollout of the NCSP. Important associations with screening attendance were subjective norms, anticipated regret, higher socio-economic status and education. Greater perceived screening barriers and lacking knowledge about the purpose of cervical screening were associated with screening avoidance. These findings support a variety of expectancy-value theories of health behaviour and behaviour change. They also suggest, however, that expectancy-value theories could benefit from the inclusion of affective predictors of behaviour, like anticipated regret. Such additions are common in the use of these theories, as is the omission of selected constructs. This practice impedes comparisons of such theories to select the most suitable theory to examine NCSP participation. Furthermore, researchers are beginning to explain cancer screening participation using dual-process models, which combine rational decision-making from expectancy-value theories with automatic cognitive processes.

To identify the most important predictors to investigate among Irish women, the first study in this project is a systematic review of reviews of associations with cervical screening behaviours. The findings suggest that predictors of screening participation comprise of environmental influences, like access issues, and psychological influences, like knowledge of screening or social interactions. This review identifies a gap in the evidence synthesis of associations with personal characteristics and health beliefs. The

second study uses focus group interviews (N = 13) to describe women's experiences of the NCSP. Thematic analysis confirms the validity of many screening predictors identified by the systematic review and expectancy-value theories, like social influence or screening attitude. Nevertheless, the findings further indicate that women might form their screening attitude independently of their knowledge of cervical screening. The third study in this project examines these potential predictors of cervical screening participation in a survey of 252 Irish women. Overall the regression analyses suggest that reduced screening barriers might encourage first-time participation, while regular attendance requires greater endorsement of the benefits of cervical screening and stronger subjective norm and intention. Positive screening attitude appears to be the most crucial predictor of strong intention. Notably, knowledge of cervical screening fails to predict screening participation and is not associated with screening intention. The final study of this project pilots an experiment (N = 92) comparing the utility of screening attitude in strengthening intention to the utility of information provision. The pilot finds no significant differences between conditions in intention or attitude, but content analysis of the participants' comments suggests that a full trial would be worthwhile, given purposive sampling and a sample retention strategy.

These findings agree with previous Irish research on the importance of screening intention, although its association with attitude appears to be much stronger in the present research. Especially experiential attitude, rather than screening knowledge, emerged as a significant predictor lending support to the utility of dual-process models. Previous Irish research has pointed to the influence of anticipated regret. In combination, these findings indicate that future screening promotion should consider interventions based on patients' experiences of screening.

Chapter 1

Introduction

> The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition.
>
> (WHO, 2005)

This is the second of the nine principles that introduce the constitution of the WHO (2005). Preceded only by the WHO's well-publicised definition of health as social, physical and psychological well-being, the second principle acknowledges each person's expectation to be well. The second principle also shows that people are assumed to assign primary importance to their health and many people engage in activities to preserve it. Others, however, risk their health, thereby calling its fundamental value into question. My research springs from my fascination with how people understand health and illness. This research focuses on the participation in organised screening to prevent the development of cervical cancer.

Organised cervical screening was introduced in Ireland in 2008. A pilot programme, the Irish Cervical Screening Programme (ICSP), had been active in the Mid-Western Health Board from 2000 until 2008 (The National Cancer Screening Service (NCSS), 2009), when the National Cervical Screening Programme (NCSP) was rolled out across the Republic. Nevertheless, the NCSP is a young programme compared to those in other countries. Finland, for example, introduced cervical screening programmes in the 1960s, while Denmark and the UK established organised cervical screening in the 1980s (Anttila, Ronco, & Working Group on the Registration and Monitoring of Cervical Cancer Screening Programmes, 2009; Arbyn, Rebolj, et al., 2009; *Scottish Cervical Screening Programme Statistics 2014-15*, 2015; Walsh, Silles, & O'Neill, 2010). My project seeks to answer two research questions:

1. What predicts the uptake of cervical screening following the introduction of the NCSP in Ireland?
2. How can we use theories of health behaviour and behaviour change to explain and increase participation in the NCSP?

The beginning of this project coincided with the start of the final year of the first three-year screening period of the NCSP in Ireland. The 12 months between 1st September 2010 and 31st August 2011 comprised the NCSP's final opportunity to meet their intermediate 60 percent screening target (NCSP, 2011, 2012).

A limited number of studies have been conducted prior to the roll out of the NCSP, but behavioural scientists have not at all investigated the cervical screening behaviours of Irish women following the nationwide introduction of the NCSP. While participation rates in the ICSP appear to have been very low at 17 percent (Walsh et al., 2010; Walsh, O'Reilly, & Tracey, 2003), the NCSP (n. d.-b) achieved 77 percent coverage in August 2014, suggesting that the screening programme has become well-established within its first six years. Yet, researchers from the UK argue that strategies to improve uptake are still a priority and vital for the success of the screening programmes (Weller & Campbell, 2009; Weller, Patnick, McIntosh, & Dietrich, 2009). Weller and Campbell caution that high screening rates can decline unexpectedly from one screening period to the following, and provide as an example a recent decrease in cervical screening attendance among younger women in the UK (Weller & Campbell, 2009; Weller et al., 2009). Theories of health behaviour and behaviour change can help identify the reasons for lower than target screening participation and suggest useful strategies to increase attendance (Shekelle et al., 1999; Weller et al., 2009).

Theories of health behaviour and behaviour change explain why people engage in health protective behaviours and what encourages health protective behaviours. These theories disagree, however, about the relative importance of different behavioural influences, such as social pressure and support, perceptions of risk, cost-benefit beliefs, or attitude. Some theories also consider readiness to change (Rosenstock, 1966), while others do not (Ajzen, 1985). Based on social-cognitive approaches to psychology, these theories pay little attention to the role of affect in decision-making (Ajzen & Sheikh, 2013; Sandberg & Conner, 2008). Emerging dual-process approaches, however, acknowledge that affect-governed intuitive reasoning also influences behaviours. This research also investigates how different theories of health behaviour and behaviour

change connect with each other and how they might be used best to explain cervical screening behaviours in Ireland.

Furthermore, reproductive health care, including cervical cancer prevention, occurs in Ireland in a special context of guilt surrounding sexuality (Balfe & Brugha, 2011; Inglis, 2005; Kuhling & Keohane, 2007). According to Inglis and MacKeogh (2012) modern Irish society pressures women to meet a double standard of the established view of women as chaste and innocent (Inglis, 2002, 2005) with that of the modern sexually independent women. Concurrently, Irish media portrays sexually independent women as immoral or transgressive. Therefore, research is required to examine cervical screening behaviours in this particular context.

Consequently, I approached my research questions from the bottom up: I began by summarising the considerable international evidence on the determinants of screening participation and investigated their relevance to an Irish sample in interview and cross-sectional research. Based on this research I designed an intervention to encourage cervical screening attendance. A realist approach to research lends itself well to this combination of fixed and flexible research designs (Robson, 2002). My project, therefore, relies on fieldwork rather than strictly controlled laboratory research. Realism takes into account that explanations of social phenomena depend on context (Robson, 2002). Weller and colleagues (2009) point out that screening attendance is subject to complex factors, such that strategies to improve uptake need to be broad and multi-faceted. The variety of screening predictors identified just by previous Irish research further points to the importance of context. Moreover, any strategy to promote screening participation will need to be considered in its context if it is to be a useful public health intervention.

Background

In Ireland increasing life expectancy (Department of Health, n.d.) suggests that people's health is protected and death is increasingly delayed. Nevertheless, the nature of health protection is changing (Holman & Lorig, 2004), and the WHO's (2005) understanding of health shows that the reduction of mortality rates is no longer sufficient. In 2008 four and five times as many Irish people died from cancer and cardiovascular diseases, respectively, as from communicable diseases (WHO, 2016). Non-communicable diseases caused far more deaths that infectious diseases (WHO, 2016). This development has led to a shift in responsibility for health protection from

treatment by medical professionals to lifestyle changes made by people themselves (Holman & Lorig, 2004). There is currently no medical treatment to eradicate cancer or cardiovascular disease and illness prevention is the best protection (Holman & Lorig, 2004). Preventive behaviour requires mundane and continuous action, such as sufficient exercise, eating fruits and vegetables in favour of meat, salt or sugar, foregoing tobacco and alcoholic drinks, and also attending for health checks and disease screening (Yach, Hawkes, Gould, & Hofman, 2004). People's level of success in engaging in these behaviours varies however, while their desire for health and well-being is assumed to be uniform.

Cervical screening is the only cancer screening method with a primary aim of preventing the development of cancer. Other screening programmes, such as for breast or bowel cancer can find cancers at an earlier developmental stage when they are more treatable, but cervical screening can find pre-cancerous cell changes and, thus, can spare women from undergoing or worrying about major surgery, chemo- or radiotherapy (Wardle, Robb, Vernon, & Waller, 2015). In the protection of women's health from cancer, cervical screening is therefore important; and behavioural researchers have investigated the determinants of cervical screening participation (Cooke & French, 2008; Everett et al., 2011; Newmann & Garner, 2005; Yabroff et al., 2005).

The recency of organised cervical screening might explain why, despite considerable international research effort to understand cervical screening behaviours (Everett et al., 2011; Jepson et al., 2000; Weller et al., 2009), Irish evidence on this topic is limited to a handful of studies. These studies comprise a qualitative evaluation of the ICSP (Bowe, 2004), focus group discussions of cervical screening (O'Connor et al., 2014), cross-sectional examinations of participants of the ICSP (Walsh, 2005, 2006; Walsh et al., 2003), an intervention to increase attendance (Walsh, 2003, 2005; Walsh et al., 2003), as well as a cross-border comparison of cervical screening behaviour in the Republic and Northern Ireland (Walsh et al., 2010).

Cross-sectional research found that only 17 percent of women who had received a cervical screening invitation from the ICSP attended for screening (Walsh et al., 2010; Walsh, 2003, 2005, 2006; Walsh et al., 2003). This proportion rose to 28 percent among women who also participated in Walsh and colleagues' (2003) survey. In Northern Ireland (Walsh et al., 2010) attendance was significantly higher (30%) than in the Republic, where screening attendance was significantly more common among women of higher socio-economic status and education, among married women and those in good

health. No such differences were found among Northern Irish women. Women younger than 30 years were less likely to participate in both countries, though Northern Irish women aged 50 to 59 years were even less likely to be screened compared to women aged 20 to 29 years. The authors suggest that these differences might have arisen from different levels of acceptance of the new programme, and that greater acceptance was likely associated with higher socio-economic status. They therefore anticipated that these differences would decrease with the increasing establishment of the NCSP (Walsh et al., 2010).

Furthermore, Walsh's (Walsh, 2005; Walsh et al., 2003) survey found that screening attendance was associated with greater perceived risk, better perceived behavioural control and stronger screening intentions. Intention, in turn, was predicted by the Theory of Planned Behaviour (TPB) variables: attitude, subjective norms, and especially perceived behavioural control (Fishbein & Ajzen, 2010). Adding anticipated regret to this regression model significantly increased the explanatory ability of the model. O'Connor and collaborators' (2014) findings elaborate on the significance of subjective norms. Their focus groups reported that they felt encouraged to attend screening, if their GPs prompted them or promoted cervical screening. Although GP attitude to screening was evidently an important influence, O'Connor and colleagues further report that a close relationship with their GP affected screening behaviour differentially: women who felt able to discuss any topic with their GPs, felt confident in being screened by their GPs, whereas other participants felt their close relationship with their GP would cause embarrassment during cervical screening.

Overall, screening participants held a generally positive attitude towards cervical screening (Bowe, 2004; Walsh, 2006) and valued it as a way of taking responsibility for their health as well as for the reassurance it provided (O'Connor et al., 2014; Walsh, 2006). They appreciated that ICSP participation was free of charge (Bowe, 2004) and some women saw cervical screening as saving their lives, which outweighed any anticipated discomfort (O'Connor et al., 2014). Several studies (Bowe, 2004; Walsh, 2006; Walsh et al., 2003) also identified barriers to screening attendance, however, such as time constraints, lacking transport or meeting an unsatisfactory or male provider and lacking access to an alternative. The turn-around time targeted by the ICSP was six weeks, but some women thought two to three weeks would be more acceptable (Bowe, 2004). The NCSP currently manages to inform 89 percent of patients of their screening result within four weeks of their test (NCSP, n. d.-b). Walsh (Walsh, 2006; Walsh et al.,

2003) and Bowe also identified psychological barriers to cervical screening, such as fear, anxiety before the screening procedure and anticipating discomfort during screening. International research has identified similar barriers to cervical screening (Bukowska-Durawa & Luszczynska, 2014). The relevance of the barrier construct, however, suggests that the Health Belief Model (Rosenstock, 1966) can also explain Irish cervical screening behaviour.

In addition, many women appear to lack information about cervical screening. Walsh's participants reported that they felt insufficiently informed (Walsh, 2006; Walsh et al., 2003). Those who had attended cervical screening were significantly more knowledgeable about the purpose of cervical screening than non-attenders. The most popular sources of screening information were GP surgeries, the media and friends (Walsh, 2006). Focus group participants whose GPs were not part of the ICSP distrusted their GPs' expertise and knowledge of cervical screening, however (O'Connor et al., 2014). In accordance with Walsh's findings, Bowe's (2004) participants desired more information, such as how to access alternative providers and information about cancer risk. Yet, they also felt that the existing screening information leaflet was too long and not encouraging to read. They suggested that screening information should convey greater urgency for screening participation. Only one-third of the participants, however, remembered reading the leaflet. In combination with Walsh and colleagues' (2003) conclusions, these findings suggest that women engage insufficiently with the screening information provided, which thus fails to encourage screening attendance. Their conclusion matches systematic review findings that question the effectiveness of education campaigns to increase screening attendance (Corcoran, Dattalo, & Crowley, 2012; Everett et al., 2011; Sabatino et al., 2012).

In the only Irish cervical screening uptake intervention to date, Walsh (2003; Walsh et al., 2003) asked a proportion of the survey participants to form implementation intentions (Gollwitzer, 2006)—action plans—for their screening participation. A significantly greater proportion, 32 percent, of this group had attended for screening at three-month follow-up compared to the control group, in which 25 percent of the participants had been screened. The results are less conclusive, however, when only those women in the experimental group who completed the intervention are considered. Walsh (2003; 2005) concluded that the effectiveness of this easily implemented intervention had implications for the nationwide rollout of organised cervical screening. Forming action plans appeared to be ineffective for previous non-attenders and Walsh

(2005) suggested their motivation to attend cervical screening should first be enhanced. Her research indicates that increasing women's anticipated regret could be helpful in this respect. Walsh (2003; Walsh et al., 2003) also suggested exploring in detail the role of affect in the Theory of Planned Behaviour as applied to cervical screening behaviour. Furthermore, the programme should consider changes to address structural screening barriers (Walsh, 2006). Both, O'Connor and colleagues (2014) and Walsh (2006), argued that educational interventions should emphasise the benefits of screening to convey a greater benefit-to-cost balance to non-attenders. To this end, O'Connor and collaborators also suggested that GPs should use their positive attitude towards screening to encourage the same positivity in their patients.

In addition, there continues to be a need for a better understanding of women's attitudes towards screening to improve uptake interventions (Stein, Lewendon, Jenkins, & Davis, 2005). O'Connor and colleagues (2014) have also noted that women's experiences and views of cervical screening could have changed following the introduction of the NCSP and argue for further research to investigate this possibility.

Although international research might indicate likely determinants of the cervical screening behaviours of Irish women—especially research conducted in the language- and media-sharing UK—Irish women have experienced cervical cancer prevention within a unique cultural background of shame and embarrassment towards sex and reproductive health (Balfe & Brugha, 2011; Inglis, 2005; Kuhling & Keohane, 2007). In the early 20th century the Catholic church's widely accepted image of women as "virgins or chaste mothers" (Inglis, 2002, p. 6) made women's health and sex education sensitive, secretive conversation topics (Inglis, 2005). Wiley (1996) reports, for instance, that older women were significantly less likely to have received adequate sex education than younger women. Wiley's least educated participants are no longer of screening age, but Inglis (2002) argues that the 1980s experienced an economic downturn alongside a return to Catholic morality. Furthermore, intercourse between unmarried people was socially unacceptable (Inglis, 2002), so unmarried women who sought reproductive health care, including cervical screening, would have risked societal reproach.

Nevertheless, Inglis (2002, 2005) argues that popular culture effected a shift in the second half of the 20th century from self-denial to self-indulgence in sexual pleasure. This cultural shift occurred in Ireland "almost a century later than in Britain and America" (Inglis, 2005, p. 30) for example, and has manifested as an ongoing debate over contraception, divorce and abortion, and resulted in social insecurity rather than

sexual emancipation (Irish Family Planning Association (IFPA), n.d.; Inglis, 2002). In addition, the IFPA's account of the gradual deregulation of condoms—which continued until 1993, with advertisements accepted on national television since 2005—suggests reproductive health remained a sensitive topic until quite recently. Recent research of testing for sexually transmitted illnesses (STIs) in Ireland has found young adults to be concerned with stigmatisation as immoral, unclean, and desiring to be thought of as respectable, normal (Balfe & Brugha, 2010, 2011) or "good girls" (Balfe & Brugha, 2010, p. 1048). Cervical cancer develops from a sexually transmitted viral infection, which I explain in detail in Chapter 2, and cervical screening has been associated with the same stigma that affects STI testing (Byrd, Peterson, Chavez, & Heckert, 2004; McCaffery, Waller, Nazroo, & Wardle, 2006; Perrin et al., 2006; Waller, McCaffery, Forrest, & Wardle, 2004). It is therefore worth investigating the predictors of cervical screening participation in an Irish context.

Structure of the thesis

This thesis is presented in two parts. The first part comprises Chapters 2, 3, and 4 which present the clinical, empirical and theoretical context of my research. Chapter 2 considers the clinical background of cervical screening. I briefly describe the aetiology of cervical cancer, its treatments, and the physical and psychological impact of these treatments. Then I introduce Papanicolaou's test and discuss the value of cervical screening. This discussion focuses on health system benefits and reduced mortality, while the first half of the chapter already demonstrates the personal value of cervical cancer prevention. Chapter 3 is a review of systematic reviews and meta-analyses that have investigated influences on cervical screening attendance internationally. I evaluate structural issues and psycho-social explanations of cervical screening participation. Chapter 4 closes a gap discovered in the review, namely a dearth of reviews of psychological theories applied to Pap test uptake. I describe and compare expectancy-value theories and their use in cervical screening participation research. Following this I introduce dual-process approaches as a potential alternative understanding of screening behaviour.

In the second part Chapters 5, 6, and 7 present my empirical research to better understand Irish women's views of cervical screening, how Pap test uptake can be predicted in Ireland, and whether these predictors might be used to strengthen screening intentions. Chapter 5 presents findings from focus groups of screened women

discussing their experiences. I conclude that the findings support expectancy-value theories, but that dual-process approaches might also have relevance. Chapter 6 follows up on the conclusions of the review and the focus groups in a survey of what predicts cervical screening intention and attendance in a larger Irish sample. The findings suggest regular screening attendance was best predicted by greater perceived benefits, stronger screening intentions, and stronger subjective norm, while attitude was the best predictor of screening intention. Knowledge about screening was unrelated to intentions and not predictive of screening attendance. Chapter 7 presents a pilot study of how to test for a causal link between attitude and screening intention. I found no significant differences, although statistical trends and participant comments indicate that a causal link cannot be precluded and a larger trial would be worthwhile.

In the final chapter I evaluate my research as a whole and discuss its conclusions and their implications for behaviour change theories as well as cervical cancer prevention in Ireland. The findings of my primary research echo the conclusion of the systematic review. The international evidence is relevant to explanations of Irish women's cervical screening behaviour, despite its unique context. In modern Irish society embarrassment rather than sexual stigma predicted screening avoidance—akin to psychological barriers identified in other economically developed countries (Bukowska-Durawa & Luszczynska, 2014). My findings are particularly well understood from the perspective of the Health Belief Model and Theory of Planned Behaviour. The findings also indicate, however, that intuitive decision-making should be considered in the development of new strategies to encourage cervical screening attendance. These conclusions suggest that further research should examine whether the NCSP's current education campaign could be adapted to suit people with primarily intuitive-experiential thinking styles (Epstein, Pacini, Denes-Raj, & Heier, 1996).

Chapter 2

Cervical cancer and Papanicolaou's smear test

Cervical cancer in Europe and Ireland

Cervical cancer is the second most common female cancer worldwide (WHO & ICO Information Centre on HPV and Cervical Cancer, 2010). Arbyn, Autier and Ferlay (2007) estimate the European incidence rate to have been 13.9 per 100,000 women in 2004. In comparison, the Irish incidence rate was 9.84 per 100,000 women, but had increased to 13.7 per 100,000 women by 2010 (National Cancer Registry Ireland (NCRI), 2012b). Most of these cancers had developed in women aged between 30 and 39 years. More than 1200 women died of cervical cancer in this period (NCRI, 2012b) at an average age of 56 years (NCSP, 2011a).

In 2004 the EU saw more than 16,000 deaths from cervical cancer (Arbyn, Raifu, Weiderpass, Bray, & Anttila, 2009). 93 of these occurred in the Republic of Ireland (NCRI, 2012b). Fortunately, the EU five-year survival chances have been increasing by two percentage points per year—mortality and survival, however, vary greatly between the member states of the EU (Arbyn, Raifu, et al., 2009). The NCRI (2012a) reports a range of survival rates from 71 percent in Iceland to 47 percent in Malta in 2002. Similarly, the Irish five-year survival rate has increased since the 1950s to stabilise at 67 percent in 2003 (NCRI, 2012a); but a recent follow-up by the OECD of patients diagnosed between 2001 and 2003 approximates the five-year survival rate to 57.6 percent, making it the lowest in the EU at the time, with 9 percentage points below the EU mean (NCRI, 2012a).

Cervical cancer is without doubt a serious illness. This chapter summarises its aetiology and treatment before discussing the merits of preventive screening.

Cervical cancer

The anatomy of the cervix. Dunleavey (2009) describes the cervix as the neck of a woman's uterus (figures 2.1 & 2.2). Its primary function is to seal the uterus to hold the foetus during pregnancy. It is also considered to play a role in female sexual functioning.

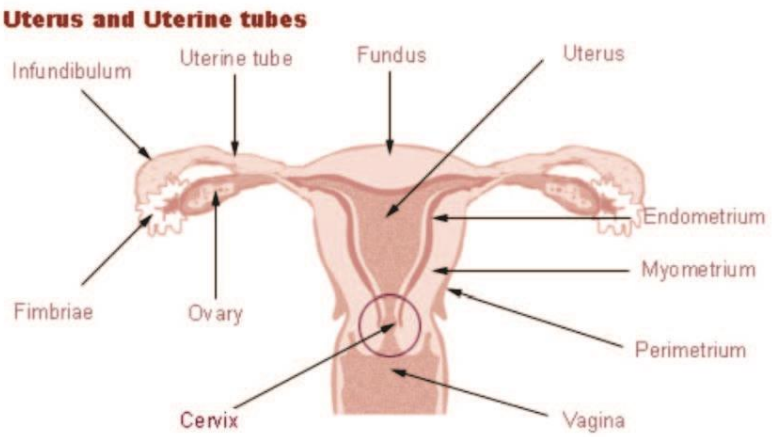

Figure 2.1. The cervix uteri is the opening of the womb. Reproduced from Wikimedia Commons, 2014b. Public Domain.

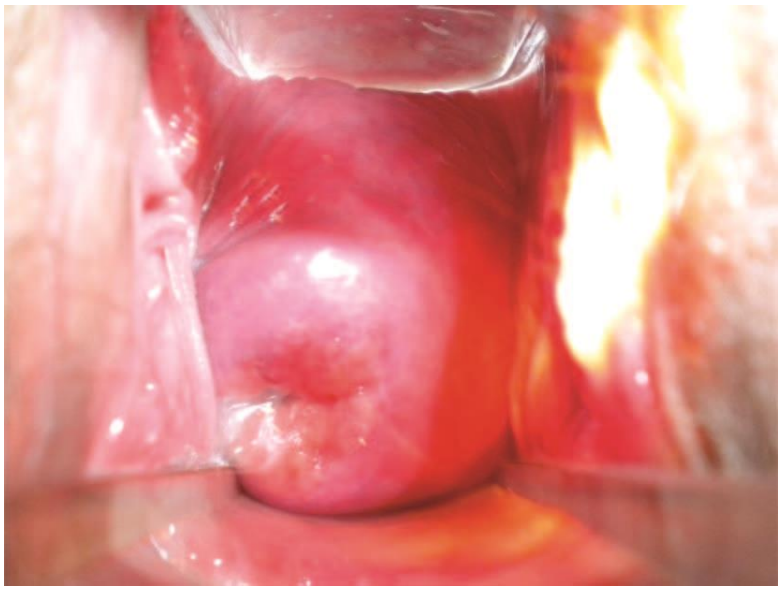

Figure 2.2. Cervix uteri of a multiparous woman. Reproduced from Wikimedia Commons, 2014a. Public domain.

"The cervix is cylindrical in shape and lies in the [lower] part of the uterus, accounting for approximately one third of the uterus" (Dunleavey, 2009, p. 3). The cervix is approximately 2.5 cm in diameter and 3 to 4 cm long; many factors, however, influence its shape and appearance, such as age, parity and the stage of the woman's physical development. The cervical mucosa consists of two types of tissue (cf. figure 2.3). Soft columnar epithelial cells line the inner part of the cervix that opens into the uterus. The outer epithelium, where the cervix protrudes into the vagina, consists of squamous cells that can withstand the acidic vaginal environment. At the junction of

these different epithelia (squamocolumnar junction) an area exists where columnar epithelium is transformed into squamous epithelium—the transformation zone (Dunleavey, 2009).

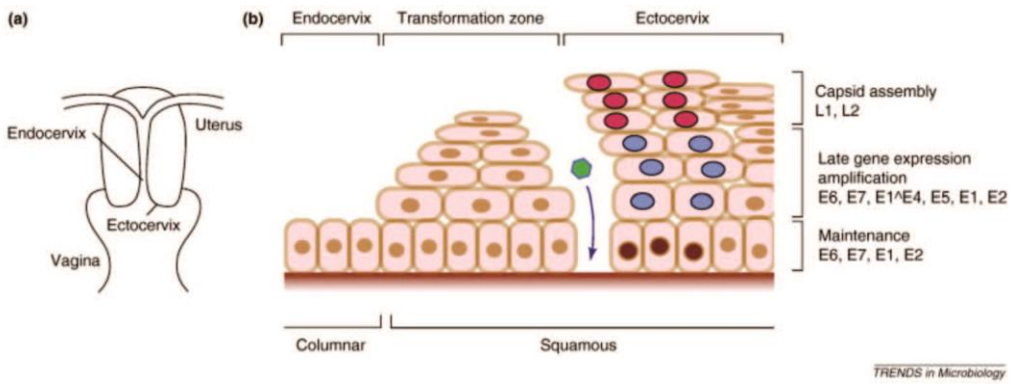

Figure 2.3. a) Endo- and ectocervix of the uterus, *b)* The transformation zone of the cervix uteri infected with human papillomavirus. Reproduced from "Persistence of human papillomavirus infection: Keys to malignant progression," J. Bodily & L. A. Laimins, 2011, *Trends in Microbiology, 19*(1), p.34. Copyright by Elsevier.

The development of cervical cancer. It is in the transformation zone that cervical abnormalities—leading to cervical cancer—are most likely to occur (Dunleavey, 2009). Oncologists distinguish between two types of cervical cancer: the more common squamous cell carcinoma of the vaginal epithelium and adenocarcinoma of the columnar epithelium (Blackledge, Jordan, & Shingleton, 1991; Stern & Stanely, 1994).

Petry (2011) considers cervical cancer to be one of the best understood cancers; research into cervical cancer dates back to the 1940s and has provided important insights into its development. Most importantly, 99 percent of cervical cancers were found to contain the DNA of human papillomavirus (HPV), though only certain strands of the virus cause cervical cancer (Dunleavey, 2009).

Human papillomavirus. HPV is a very common virus that attacks the regenerating layers of skin tissue (Dunleavey, 2009). According to Bodily and Laimins (2011), infection with HPV is the most common venereal disease. As shown in their diagram (figure 2.3b) the virus enters the body through vulnerable parts of the epidermis, such as the transformation zone of the cervix or epithelial microtraumata (Bodily & Laimins, 2011).

HPV then uses these rapidly dividing cells to reproduce the eight proteins coded by its own DNA. The initially reproduced types of HPV-protein inhibit the differentiation of the host cells. The host cell will thus continue to divide indefinitely. As HPV integrates its DNA into the host cell, so-called squamous intraepithelial lesions (SIL) or cervical intraepithelial neoplasia (CIN) occur. Low-grade SIL only affect the basal layer of the cervical epithelium, but as the abnormal cells spread to the upper layers high-grade SIL develop. When the entire epithelium consists of undifferentiated, continually dividing cells, carcinoma in situ (CIS) have developed. These are the final precursors of invasive cervical cancer (Dunleavey, 2009). High-risk types of HPV inhibit the host cell's tumour suppressor genes later on in the process of their own reproduction (Stern & Stanely, 1994). It is assumed that this process is part of the development of invasive cervical cancer, but a complete understanding of the required genetic events has yet to be developed. At present, it is suspected that longer prevalence of the virus in the cell allows for more chromosomal mutations that can lead to cancer (Bodily & Laimins, 2011).

Persistent infection as a prerequisite for cervical cancer. According to Bodily and Laimins (2011), a persistent and untreated infection with HPV is the most important precondition for the development of cervical cancer. The authors explain, however, that a strong immune response, as initiated by contact with the outer epidermis is missing, because HPV attacks the most basal layer of the epidermis. Their figure 2.3b also shows the staged development of new HPV. In the early stages of the reproduction of HPV DNA the differentiation-inhibiting proteins also fail to cause an immune response, because the actual viral structures have yet to develop.

New HPV is built later on in the process, when the host cell has progressed to the upper layers of the epidermis where immune activity is lower, as these epidermis cells are about to die and be shed (Bodily & Laimins, 2011). Thus, infection with high-risk[1] HPV is symptomless and HPV infections are impossible to notice without cervical screening (Blackledge et al., 1991; Dunleavey, 2009).

Although most infections with HPV typically clear within 12 to 18 months (Bodily & Laimins, 2011), "[…] infections that persist for more than three years are unlikely to resolve spontaneously" (Dunleavey, 2009, p. 13) and 15 percent of low-grade SIL develop into high-grade SIL (Dunleavey, 2009). Thirty to 40 percent of the latter

[1] Infection with low-risk HPV is known to cause genital warts, but not cervical cancer (Dunleavey, 2009).

progress into invasive cervical cancer if untreated (Souhami & Tobias, 2005). The literature is unclear about how long cervical changes take to produce cancerous cells. Statistical modelling suggests an *average* range from 10 to 15 years (Dunleavey, 2009), but a minimum of 2 years and a maximum of 50 has been reported (Dunleavey, 2009; Miaskowski & Buchsel, 1999).

Symptoms and disease progression. Cervical cancer is a life-threatening illness; however, symptoms occur only in the late stages of the disease, when large tumours exert pressure on nearby organs. Skloot (2011) provides an illustrative account of cervical cancer progression without early detection in her case study of Henrietta Lacks. Vaginal bleeding after sexual intercourse, which might result from damage to the sensitive cancer tissue, is a very common symptom (Blackledge et al., 1991). Urethral obstruction can also occur; if untreated, it can lead to renal failure and death. Similarly, obstructions of the lymphatic system or lymphatic metastases can lead to lymphoedema in the lower limbs. Internal wounds and pressure on or metastases in the surrounding nerves can produce severe pain. Further, fistulas can develop linking the vagina to its surrounding organs and resulting in unpleasant vaginal discharge (Dunleavey, 2009), which patients experience as debilitating and socially isolating (Naru, Rizvi & Talati, 2004 as cited in Dunleavey, 2009). In addition, Souhami and Tobias (2005) report a variety of symptoms of late stage gynaecological cancers that cancer treatment can also cause: fatigue, breathlessness, anorexia, nausea, vomiting, constipation and fungating wounds. According to Souhami and Tobias, over 50 percent of cervical cancer patients are diagnosed when the tumour has spread to other cervical tissue or is beginning to spread to nearby organs.

Survival and treatment. According to Waggoner (2003) patients with stage I and smaller stage II lesions have 85 to 100 percent five-year survival rate. Chances of survival, however, decline dramatically thereafter:

- larger stage I and stage II lesions: 50 to 70%
- stage III: 30 to 50%
- stage IV: 5 to 15%

While HPV infections are untreatable (Dunleavey, 2009), high-grade cervical lesions and persistent LSIL are treated with tissue-eroding or excisional methods following colposcopic assessment (Blackledge et al., 1991; Dunleavey, 2009). Large Loop Excision

of the Transformation Zone (LLETZ) has recommended itself in meta-analysis as the most efficient procedure with comparatively less severe side-effects, such as bleeding, pain or fertility issues (Martin-Hirsch, Paraskevaidis, Bryant, Dickinson, & Keep, 2010).

Depending on the disease stage at diagnosis cervical cancer is treatable with surgery, possibly combined with radio- or chemotherapy. Advanced tumours, however, might have metastasised or can be too large to excise them accurately; that is, without any cancerous margins remaining. In such cases radio- or chemotherapy is often more effective than surgery (Blackledge et al., 1991). Unfortunately, acute and long-term side-effects accompany all treatment options; their severity varies from mild to life changing:

> Although modern therapies offer a real chance of cure this is not without a cost, this being the ongoing management of treatment-related toxicity.
>
> (Dunleavey, 2009, p. 69)

Surgery. Surgery has a curative role in early-stage cancer, usually taking the form of hysterectomy or fertility-preserving trachelectomy of the cervix (Barrett, Dobbs, Morris, & Ruoque, 2009). In more advanced cervical cancer surgery takes on a palliative role and often involves exenteration of the pelvic organs (Dunleavey, 2009).

Although one of the most common gynaecological operations (Fenton & Panay, 2012), up to 45 percent of hysterectomy patients experience side-effects (Plotti, Sasone et al., 2011). The extent of the side-effects, though, depends on the extent of the excision. Radical hysterectomy is most commonly used; but, as the most extensive excision, it carries the greatest potential for complications. Kietpeerakool, Lattiwongsakorn, and Srisomboon (2008) report fever as the most common side-effect.

In addition, hysterectomy leads to infertility, early menopause and also impacts on sexual functioning (Dunleavey, 2009). Pieterse and colleagues (2006) list a variety of symptoms impeding the quality of sexual intercourse; and report decreased sexual interest and vaginal lubrication as long-term effects of hysterectomy. Furthermore, after the operation patients awake with a urinary catheter and will have to relearn normal urination (Dunleavey, 2009). Bladder dysfunction is common during the first 12 months after hysterectomy and approximately 70 percent of hysterectomy patients experience long-term bladder dysfunction (Plotti, Angioli, et al., 2011) with 17 percent feeling moderately or severely distressed by their symptoms (Bergmark, Avall-Lundqvist, Dickman, Henningsohn, & Steineck, 2002). Bergmark and co-authors found even more frequent reports of distress from bowel dysfunction. The most common problems are

abdominal pain and constipation. In addition faecal leakage was the most momentarily distressing symptom (Bergmark et al., 2002). There is also a risk of lymphoedema of the lower limbs and of nerve damage during hysterectomy which can cause severe pain that will usually require further surgery (Dunleavey, 2009).

Cervical cancer probably recurs in 25 percent of surgery patients. Palliative pelvic exenteration can help, when treatment regimes have exhausted the maximum levels of chemo- and radiotherapy and severe symptoms have greatly diminished the patient's quality of life (Hope & Pothuri, 2013); it has curative benefits only in patients without extra-pelvic disease (Blackledge et al., 1991; Hope & Pothuri, 2013). The operation consists of two stages: the removal of all pelvic organs, including urinary and lower intestinal organs, followed by the reconstruction of the vagina, pelvic floor reinforcement and the restoration of bowel and urinary continuity (Blackledge et al., 1991). The reconstructive phase helps to avoid permanent colostomy and to improve the patients' quality of life after the operation (Hope & Pothuri, 2013). Complications might negate the anticipated improvement of quality of life and include infections, gastro-intestinal issues, pelvic fistulae and wound breakdown (Hope & Pothuri, 2013). In a survey of 55 patients, for example, 58.2 percent experienced complications and 38 percent required further surgery (Marnitz et al., 2006). Hope and Pothuri found five-year survival to vary between 14 and 27 percent for palliative pelvic exenterations. Post-operative mortality ranged from 5.5 to 0.06 percent.

> … the risk of this surgery is so great that it should be applied only when there is a chance of cure that exceeds the operative mortality rate.
>
> (Blackledge et al., 1991, p. 377)

There is also much debate over the psychological impact of these surgical procedures. Rezk and colleagues (2013) argue that post-surgical morbidity affects physical, emotional, social and sexual functioning, but found also that the patients adjusted reasonably well in major areas of life after pelvic exenteration. Similarly, a recent study (Plotti, Sasone, et al., 2011) comparing the quality of life in patients treated with hysterectomy for cervical cancer or a benign condition found that despite worse post-operative morbidity in women with cervical cancer, the groups showed similar levels of sexual activity and sexual enjoyment. The authors, therefore, conclude that this treatment approach preserves quality of life and could be particularly suitable for younger patients (Plotti, Sasone, et al., 2011).

Further, a qualitative study (Carter et al., 2004) of six patients reveals the immediate post-operative period to be the most difficult. Most patients reported amnesia during the first three days after surgery. Five patients experienced complications and four experienced depression. Most participants worried about colostomy initially, but at three-month follow-up they felt comfortable with the procedure. Of the three patients who had vaginal reconstruction only one attempted intercourse, but penetration was unsuccessful. Those women who had been operated more than three years previously had returned to work. Although the authors (Carter et al., 2004) conclude that quality of life returned in the majority of patients with increased time since their operation, sexual dysfunction appeared to be a persistent concern. The women demanded information provision on the physical, psychological and sexual side-effects of the procedure.

Moreover, in a prospective survey of 52 patients who had had a hysterectomy, 44 reported sub-clincal depressive symptoms and 45 reported moderate distress at six-month follow-up, though scores differed insignificantly from re-operative assessment and improved over the 2-year follow-up period (Carter et al., 2010).

Hope and Pothuri (2013) describe pelvic exenteration as one of the most morbid procedures of gynaecologic oncology and the decision to perform as among the most difficult for both doctors and patients. Although information provision appears to have improved in recent years (Dunleavey, 2009), the extensiveness of the procedure means "[patients] planned for pelvic exenteration might be the most anxious group of women undergoing radical genital treatment" (Hope & Pothuri, 2013, p. 93). It is now expected, however, that a pre-operative psychiatric assessment of patients, the involvement of the complete surgery team in patient care as well as the involvement of the patients' families and spouses throughout the patients' treatment can achieve good psychological recovery from these procedures (Carter et al., 2004; Rezk et al., 2013; Turns, 2001).

Radiotherapy. Larger tumours are difficult to remove completely surgically. A more suitable treatment option is often radiotherapy. Two types of radiotherapy can treat cervical cancer: external beam radiotherapy and intra-cavity Brachytherapy (ICBT, Dunleavey, 2009). ICBT is preferred as it has a high chance of providing a successful cure. Five-year survival rates, however, depend on the stage of the cancer. Blackledge and colleagues (1991) present survival rates of approximately 90 percent for stage IB, 80 percent for stage II and 50 percent for stage III.

Few studies have examined patients' experiences of radiotherapy. Faithfull and Wells (2003) found that women fear the idea of being treated with radiation and perceive the

extreme focus on planning before the treatment as dehumanising. The large machines associated with external beam radiotherapy frighten the patients, as do the strange noises emitted by the apparatus. In addition, the participants associate the skin marks—often tattoos—needed to accurately position the radiation source, with branding.

Similarly Warnock (2005) reports that participants describe Brachytherapy as barbaric. ICBT can create considerable discomfort: in order to ensure exposure of the correct body parts to radiation and minimise exposure of healthy tissue, the vaginal radiation source might need to be stitched in place and the patient must lie still for 72 to 96 hours. Catheterisation and constipating medicine are necessary. At a minimum, the lack of movement places patients at risk of thrombosis (Dunleavey, 2009).

In Warnock's (2005) interview study participants reported being worried about the treatment duration, pain, being alone and lying still. In addition, participants suffered from backaches, nausea, difficulties with eating and abdominal wind. Some participants required pain treatment with opiates. Moreover, Maduro, Pras, Willemse and de Vries (2003) predict that up to 61 percent of radiotherapy patients experience complications.

Radiotherapy side-effects occur in two phases: early acute effects that resolve with medical treatment, and late effects, which usually occur sometime after treatment and are persistent (Maduro et al., 2003). Their impact on the patient's quality of life depends on which organs are affected and the extent of the damage (Faithfull & Wells, 2003). Acute effects result from damage to previously healthy epithelial cells of the organs surrounding the tumour. These involve small bowel inflammation, cystitis, bone marrow suppression, radiodermatitis, fatigue and urogenital complications. Deeper radiation damage to these tissues causes late effects. Thereby, enteritis and cystitis can become chronic (Blackledge et al., 1991). Narrowing of the vagina and pelvic fracture from damage to bone tissue can also occur (Dunleavey, 2009).

Research on patients treated with radiation found that quality of life is lowest during the treatment period (Bjelic-Radisic et al., 2012). Vistad, Fosså, and Dahl (2006) found that quality of life is lowest in cervical cancer survivors treated with radiotherapy and Maduro and colleagues (2003) report that two years after completing radiotherapy the patients' quality of life is still significantly lower than that of healthy controls.

Thus, although radiotherapy is the main treatment option for advanced cervical cancer, its considerable and severe side-effects can have a lasting impact on patients' lives.

Chemotherapy. Chemotherapy is the most widely known cancer treatment (Adlard & Hume, 2003). Cisplatin appears to be the single most effective chemotherapy agent for cervical cancer with response rates ranging from 17 to 21 percent (Blackledge et al., 1991).

Due to this low response rate, chemotherapy for cervical cancer is useful mainly to relieve symptoms of advanced, recurrent or metastasised tumours or in advance of surgery or radiotherapy to improve treatment outcomes (Dunleavey, 2009).

Dunleavey (2009), however, explains that failed surgery or radiotherapy have usually preceded palliative chemotherapy and compromise its effect. Previous treatment might have reduced the blood supply to cancerous tissue that is necessary for effective chemotherapy. In addition, oxygen deficiency, which might result from decreased blood supply, acts as a stressor on the tumour DNA and alters the genetic expression of the tumour and further increases its treatment resistance (Xie et al., 2010). Higher doses were the first response to this problem. Although response rates improved, according to Tambaro and co-workers (2004) higher doses failed to also produce improved survival rates, but rather led to increased toxicity risk. The current attempt to improve survival rates through combination chemotherapy with two agents is facing similar issues. Davidson's (2011) review concludes that although a combination of topotecan and cisplatin increased survival more so than other combined therapies, it generates a similar increase of side-effects. Recent studies primarily report reduced white blood cell counts as an issue (Davidson, 2011; Symonds et al., 2011).

Surprisingly little attention has focused on the quality of life of patients (Davidson, 2011; Dunleavey, 2009) and research findings are inconclusive. Chambers, Lamb, Kohorn, Schwarz and Chambers (1994 as cited in Dunleavey, 2009), for example, report pain reduction in 67 percent of patients treated with cisplatin, but this small trial requires follow-up research and replication (Dunleavey, 2009; Tambaro et al., 2004). In addition, Davidson reports that the toxic effects of combination-therapy are just as detrimental to patients' quality of life as cisplatin-only treatment. Symonds and co-authors (2011), however, found that physical and role functioning deteriorates throughout chemotherapy, while emotional functioning improves. This suggests that their sample adjusted at least psychologically to the positive and negative effects of chemotherapy.

The reduced effectiveness of chemotherapy following other treatments led to the development of neoadjuvant chemotherapy—prior to surgery or radiotherapy—but the

usefulness of this strategy remains controversial. In patients with tumours exceeding a width of 4 cm chemotherapy can reduce tumour size and make surgery possible (Rydzewska, Tierney, Vale, & Symonds, 2012; Tierney & Neoadjuvant Chemotherapy for Cervical Cancer Meta-analysis Collaboration (NACCCMA), 2009). Rydzewska and colleagues found chemotherapy to increase survival after surgery, though Shueng, Hsu, Jen, Wu, and Liu (1998) report that neoadjuvant chemotherapy is less successful when combined with radiotherapy. They conclude "chemotherapy followed by radiotherapy should not be a standard treatment for advanced cervical cancer" (Shueng et al., 1998, p. 895). A Cochrane review found, however, that intense chemotherapy preceding radiotherapy improved survival while mild chemotherapy could decrease survival rates (Tierney & NACCCMA, 2009), although the authors caution that their small data set limits the reliability of their findings.

Despite limited information on side-effects from chemotherapy, Dunleavey (2009) concludes that the risk of side-effects from neoadjuvant chemotherapy is similar to other treatment options. In addition to the wide and varied range of toxicity from cisplatin, primary side-effects of chemotherapy are bone marrow suppression and nausea or vomiting (Dunleavey, 2009).

Bone marrow suppression results from the non-specific action of chemotherapy agents which impedes cell division. While transfusions can replace the lost red blood cells and platelets, this is impossible for white blood cells—leading to reduced immune functioning, the single most important side-effect in cancer treatment (Dunleavey, 2009).

Chemotherapy-induced nausea and vomiting (CINV) are likely to occur with cisplatin treatment due to its damaging effect on the gastric nerves that stimulate the vomiting centre in the brain (Dunleavey, 2009). Anti-emetics usually help the symptoms. Research evidence on the effectiveness of non-pharmacological treatment approaches, such as guided imagery and progressive muscle relaxation, is limited (Dunleavey, 2009). Dunleavey distinguishes three types of CINV: acute CINV, delayed CINV and anticipatory CINV. Acute CINV occurs within 16 to 24 hours after treatment administration. Nausea affects 39 and vomiting affects 12 percent of patients (Hilarius et al., 2012). Secondly, delayed CINV has a later onset, but can last six to seven days (Dunleavey, 2009). Hilarius and colleagues found 68 and 23 percent of their sample suffered from delayed nausea and vomiting, respectively. Haiderali, Menditto, Good, Teitelbaum, and Wegner (2011) present similar prevalence rates for both types. Finally,

anticipatory CINV is a conditioned response to the chemotherapy environment. Approximately 30 percent of patients suffer from anticipatory CINV, which has established itself by the fourth or fifth treatment session (Dunleavey, 2009). According to Hilarius et al., CINV is more common among younger patients and women, and so has special relevance to the treatment of cervical cancer. Although the outpatient administration of chemotherapy makes these symptoms problematic, Vidall (2011) reports that health care providers disregard their severity and significance for the patient. Supporting this opinion, Hilarius et al. stress that especially the treatment of delayed CINV needs more attention. In addition, Burmeister, Aebi, Studer, Fey, and Gautschi (2012) discovered an overuse of serotonin-based anti-emetics for delayed CINV. These findings make the carers' response to CINV appear automatic and its treatment perfunctory. In consequence, 90 percent of those suffering from inefficiently treated CINV report that their symptoms affect their daily functioning considerably, compared to only 37.2 percent of those with satisfactory treatment (Haiderali et al., 2011).

In summary, chemotherapy is of limited use in the treatment of cervical cancer. Its main role is to treat metastatic cervical cancer and to improve tumour response to subsequent radiotherapy. The side-effects of chemotherapy are manifold, due to its non-specific effect on the body with the principle issues relating to nausea or vomiting and reduced immune response from bone marrow suppression.

Psychological effects of cervical cancer and its treatment. This chapter has already shown how physical side-effects of cervical cancer treatment can reduce quality of life. In addition, the disease and its treatments also have direct psychological effects on quality of life.

From a review of the literature, Herzog and Wright (2007) conclude that a period of increased anxiety begins for patients with the receipt of an abnormal cervical screening result. The authors found that women overestimate their likelihood of developing cervical cancer (Maissi et al., 2004 as cited in Herzog & Wright, 2007), and therefore their most common response is to fear a life-threatening diagnosis without cure in the face of the unknown (Breitkopf, Catero, Jaccard & Berenson, 2004 as cited in Herzog & Wright, 2007). In addition, women's reactions include self-blame, anger and feelings of powerlessness (Perrin et al., 2006; Waller, McCaffery, Forrest, & Wardle, 2004). The reviewed studies further recount changes in women's body image, concerns about sexual functioning and decreased sexual interest (Herzog & Wright, 2007). Long waiting

times for follow-up tests and results serve to exacerbate these effects (Basen-Engquist et al., 2003 as cited in Herzog & Wright, 2007).

It is unsurprising then that research finds even more pronounced effects among women with cervical cancer or pre-cancerous lesions. Kola and Walsh (2009) report increased anxiety, particularly among patients treated with LLETZ, but also among colposcopy patients. Herzog and Wright (2007) report more mood disorders among survivors of cervical cancer than survivors of other gynaecological cancer. Bradley, Rose, Lutgendorf, Costanzo and Anderson (2006 as cited in Herzog & Wright, 2007), for example, found significantly higher levels of depression among women with early-stage cervical cancer and CIN than exist among the general population. Further, organ loss and scarring from surgery distort patients' body image and increase anxiety. In particular the loss of reproductive organs can lead women to question their femininity. Non-surgical treatment has similar psychological effects. Hair loss in chemotherapy patients, for instance, serves as a constant reminder of the treatment, while diarrhoea from radiotherapy impedes on patients' freedom of movement and complicates travel. The authors report social withdrawal in women facing these issues (Herzog & Wright, 2007). Further, vaginal atrophy and stenosis as well as diminished sensation can decrease sexual interest. The loss of fertility and early menopause alter patients' body image. Herzog and Wright found that research on the impact on sexual functioning is scarce, despite its significance. Apparently treatment side-effects impede satisfactory sexual functioning, even when patients are already coping with disruptions to their mental health and social life.

Regarding social relationships, research of cervical cancer patients and their spouses found that partners desire to participate in their spouses' care; they feel guilty that their spouses have become ill. Although 50 percent report that their spouses' illness affects their work performance, they report a lack of opportunities to talk about the psychological effects that cervical cancer has on them (Lalos, 1997 as cited in Herzog & Wright, 2007). Often an unequal response of the patients and their partners to the diagnosis can disrupt their relationship and intimacy. For example, patients were less likely to dwell on their disease or treatment and more likely to cope through positive thinking (Zacharias, Glig & Foxall, 1994 as cited in Herzog & Wright, 2007). Especially partners who are unaware that monogamy cannot prevent HPV infection, might falsely assume infidelity of their spouse based on the diagnosis, adding to the disruption of their relationship (Linnehan & Groce, 2000). Equally, the patients might assume

infidelity on their spouses' part (McCaffery et al., 2003; McCaffery, Waller, Nazroo, & Wardle, 2006).

Nevertheless, a recent review by Goncalves (2010) suggests a more positive picture. The study focused on research published since 2009 on the physical and psychological quality of life of women who had recovered from cervical cancer at least three years prior and had been without any symptoms or treatment since. Goncalves concluded that these women had achieved good long-term quality of life similar to healthy controls. She found, for example, equal levels of sexual functioning: of the 82 percent who were sexually active 91 percent enjoyed their sexual activity. Nevertheless, one study (Greenwald & McCorkle, 2008 as cited in Goncalves, 2010) found limited and episodic symptoms of depression in 50 percent of patients. Despite lacking information on disease staging in Greenwald and McCorkle's study, the authors presume that the relationships of women with early-stage cancer appeared to be at lower risk of negative impact from the disease (Goncalves, 2010). A comparison of women treated for non-invasive or invasive cancer, however, found that both groups reported similar psychological and physical quality of life (Bartoces et al., 2009 as cited in Goncalves, 2010).

In conclusion, these reviews appear to suggest good chances of recovery from considerable psychological pain. The intensity of these effects appears to vary by cancer stage as well as the time since treatment ceased. Depression and anxiety appear to be the most common problems, but identity issues seem to occur frequently as well. There is also an effect of cervical cancer on social and sexual relationships. While these effects might dissipate in some women, as their health improves, others appear to recover less successfully. Further research on coping with cervical cancer might be helpful to explain this difference.

Cervical cancer prevention

Above all, cervical cancer is a preventable disease, because of its dependence on infection with HPV. De Martel and colleagues (2012) calculated that the prevention of HPV infections could have avoided 5 percent of *all* new cancer cases diagnosed worldwide in 2008. This includes all cases of cervical cancer, which constitute 50 percent of infection-related cancers in women (de Martel et al., 2012). Fortunately, methods to detect, treat and, in recent years, to prevent cervical HPV infections now exist.

Papanicolaou's smear test. Presently, most preventive interventions centre on Papanicolaou's (Pap) smear test. The Pap test relies on the detection of abnormal cells in the cervical epithelium caused by HPV. These can then be monitored and, if the body's immune system fails to clear the infection, treated surgically before cervical cancer can develop.

The Pap test requires a cell sample of the ecto- and endo-cervical epithelia, including the transformation zone, which can be examined for abnormal cells in a cytology laboratory. In order to obtain such a sample, the smear taker inserts a cotton bud or specially designed brush into the patient's vagina to wipe epithelial cells off the cervix (cf. figure 2.4). The *Guide for Smeartakers* (NCSP, 2011a) describes the process in more detail.

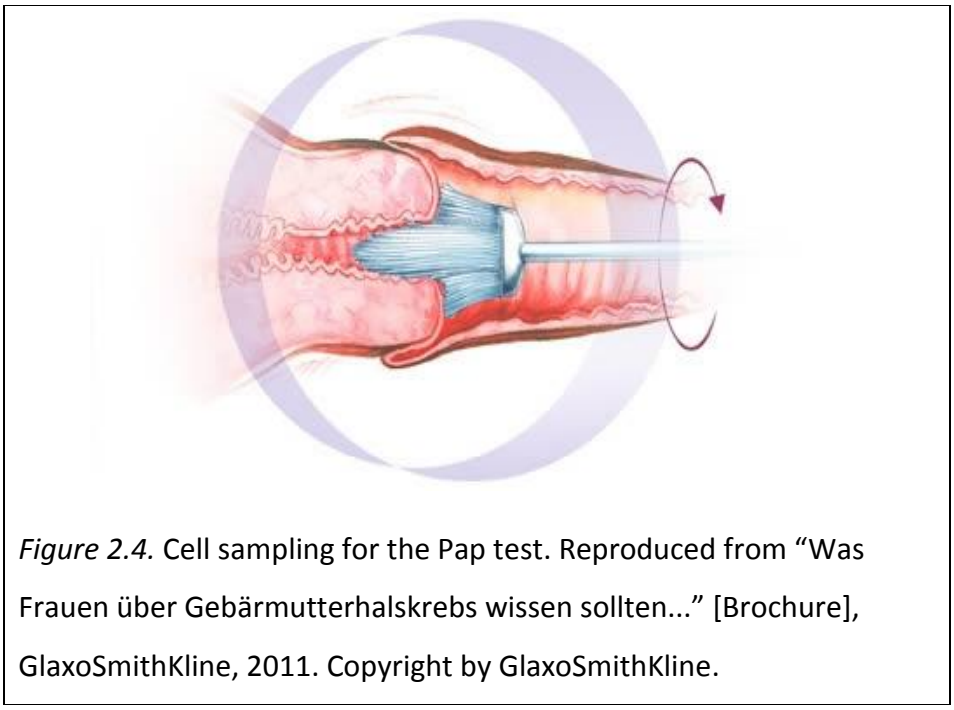

Figure 2.4. Cell sampling for the Pap test. Reproduced from "Was Frauen über Gebärmutterhalskrebs wissen sollten..." [Brochure], GlaxoSmithKline, 2011. Copyright by GlaxoSmithKline.

Irish laboratories use liquid based cytology to evaluate cell samples, as this method reduces the number of samples considered unsatisfactory or inadequate. The Bethesda System (NCSP, 2011a) classifies adequate cervical cytology as follows:

- no abnormalities detected (NAD)
- Atypical squamous cells of undetermined significance (ASC-US)
- Atypical squamous cells – cannot exclude high grade (ASC-H)
- Low-grade squamous intraepithelial lesions (LSIL)
- High-grade squamous intraepithelial lesions (HSIL)
- Query squamous cell carcinoma

A similar classification of the stages of less common adenocarcinoma does also exists (NCSP, 2011a).

Cervical screening programmes. In conjunction with the European Cancer Network and the International Agency for Research on Cancer (IARC) the European Commission has developed guidelines for quality assurance in cervical screening (Arbyn et al., 2008). The authors suggest that three- to five-yearly Pap tests can reduce the risk of cervical cancer by 80 percent, but only in an organised, population-based and quality assured cervical screening programme. Striving to realise the guidelines set out by the European Commission, the Republic of Ireland developed CervicalCheck—The National Cervical Screening Programme (NCSP, 2010).

Following a regional pilot, the NCSP commenced work nationwide on 01 September 2008. The programme offers free triennial Pap tests to all women aged 25 to 44 years and, given two consecutive normal results, screening continues thereafter in five-year intervals until the age of 60 years (NCSP, 2010). Although other countries commence screening at an age younger than 25 years, research by the IARC and the Advisory Committee on Cervical Screening found a lack of additional public health benefits from such practices (NCSP, 2010, 2011b). According to the NCSP (2010), the treatment of minor lesions found at this age will increase psychological and health care costs, rather than health benefits, as the body's immune system usually repairs such lesions, before they develop into cervical cancer.

Since 01 September 2010, women have three options to access free NCSP Pap tests. They may await their invitation letter posted by the NCSP, register themselves on the NCSP website or have their smear taker register them, when they attend for a free Pap test without an invitation letter (NCSP, 2010). The NCSP's screening registry and call – re-call invitation system accord with the recommendations of the European Commission (Arbyn et al., 2008).

The NCSP works in conjunction with approximately 4600 chartered smear takers, two cytology laboratories and 15 colposcopy units to ensure the detection and treatment of pre-cancerous cervical lesions (NCSP, 2011b).

Do cervical screening programmes work? "CervicalCheck has a challenging target of reaching 80 percent of the eligible population" (NCSP, 2011b, p. 9). The NCSP aimed to reach this target by the end of the second three-year interval (31 August 2014), in order to achieve an 80 percent reduction of cervical cancer incidence (NCSP, 2010). By the end of August 2011 the NCSP (2012) had screened 60.9 percent of the eligible

population and thus achieved their goal of 60 percent for the first three-year interval of the programme. The programme achieved 77 percent coverage by August 2014, just below their six-year target of 80 percent (NCSP, n. d.-b)

Ireland thus achieved similar coverage rates to those of England, the Netherlands, Sweden, Finland and France in 2008 (Anttila, von Karsa, et al., 2009). Across the EU, however, coverage ranged from 10 to 79 percent. Although these figures show that some of the member states are close to achieving the 80 percent target, recent reports find declining screening attendance in England and Sweden, especially among younger women (Lancucki et al., 2010; Waller, Jackowska, Marlow, & Wardle, 2012; Weller & Campbell, 2009). NCSP coverage is highest for women aged 25 to 29 years and declines notably for women aged 45 years and over (NCSP, n. d.-b). Furthermore, Sweden experiences great regional variation in coverage from 64 to 91 percent (Broberg et al., 2013). The NCSP (n.d.-b) also observed regional variation in Irish coverage with five counties meeting target coverage, but three counties at less than 70 percent coverage.

During the first three-year interval 84.5 percent of all NCSP Pap test results were normal (NCSP, 2012); in the most recent screening period this proportion rose to 90.2 percent (NCSP, n. d.-b). Of the remaining tests 0.01 percent detected invasive squamous cell carcinoma in each year (NCSP, 2010, 2011b, 2012, n. d.-a, n. d.-b). In recent years the NCSP saw a reduction of ASC-US, which continued to constitute the largest proportion of abnormal results. LSIL and HSIL showed some decline over the fourth and fifth year of screening (NCSP, 2014, n. d.-a), but were approaching previous frequencies by August 2014 (NCSP, 2012, n. d.-b): 3.8 percent and 1.2 percent, respectively.

To evaluate the quality of the programme the NCSP reviews the proportion of women whose abnormal Pap test results concur with colposcopy outcomes—the Positive Predictive Value (PPV). Although the PPV for both LSIL and HSIL declined from 01 September 2008 to 31 August 2013 (NCSP, 2010, 2011b, 2012, 2014, n. d.-a), the NCSP (n. d.-b) reports an increase to 79.8 percent by August 2014. In addition, the proportion of inadequate Pap tests increased from 0.5 percent to 1.9 percent (NCSP, 2010). Nevertheless, the NCSP continuously surpassed its PPV threshold of 65 percent and found their screening programme to be of satisfying quality by the end of the first three-year screening round (NCSP, 2012).

Although no-one has evaluated the effectiveness of the Pap test in a randomised controlled trial, research comparing national mortality rates before and after the

introduction of screening programmes has established the test's potential (Dunleavey, 2009). A comparison of trends in cervical cancer mortality in Norway with no organised cervical screening to Finland and Iceland where organised screening was introduced by the early 1970s shows that mortality decreased faster in Finland and Iceland than in Norway with otherwise comparable social and public health developments (Lăără, Day, & Hakama, 1987). More recently Vaccarella, Lortet-Tieulent, Plummer, Franceschi, and Bray (2013) demonstrated that countries with organised cervical screening programmes showed decreasing trends of cervical cancer risk and incidence.

In an economic climate which *The Economist* called the European "recipe of austerity and reforms" (Anonymous, 2013, p. 61), it is important to consider the financial benefit of cervical screening—especially, as the Irish Government has been advised to exercise "greater fiscal discipline in health expenditure […] ensuring future fiscal sustainability."(Duffy, McQuinn, Morley, & Foley, 2015, p. 38). While Irish figures are still unavailable (NCRI, 2010), a Swedish study discovered a profound reduction in health care expenditure through cervical screening. According to Bistoletti, Sennfält, and Dillner (2008), a triennial screening programme from age 32 to 60 years will cost $319 for nine life-time Pap tests per woman compared to $550 in spending per woman for treatment without screening. In addition, the authors describe the expense of cervical cancer treatment to range from $2,000 for surgery of stage 1A cancer to $16,000 for terminal care—in comparison to $30 per one Pap test per woman. Colposcopies with biopsy and treatment for CIN 2 and 3 cost approximately $240 and $800, respectively (Bistoletti et al., 2008). Thus, even the additional expenses of following up abnormal Pap tests and treating early changes are well below the costs of treating cervical cancer at any stage. Beyond health care costs, however, cervical screening also increases life expectancy: the life-time risk of cervical cancer without screening was 2% in Sweden in 1965. Assuming it remained stable after the introduction of the Swedish programme, Bistoletti and colleagues expect women aged 32 years now to live an additional 50.3 years. Triennial screening can raise life expectancy to 51 years remaining at age 32 (Bistoletti et al., 2008). In view of increasingly prevalent HPV infections since 1965, however, Bistoletti et al. reason that the present risk of cervical cancer has risen accordingly. Consequently, the figures presented by Bistoletti and colleagues likely underestimate the true cost-effectiveness of cervical screening. Needless to say that both reduced costs and increased life expectancy are additional to avoiding the physical and psychological pain of cervical cancer.

Alternative preventive measures. In recent years researchers have developed two further methods that could help cervical cancer prevention: HPV-DNA testing and HPV vaccines.

Firstly, HPV-DNA testing may become part of the Pap test routine to confirm the presence of carcinogenic HPV types in women with abnormal Pap tests. Research suggests the additional tests deal more efficiently with ASC-US and LSIL and avoid over-treatment, especially when high-risk HPV types are absent (Lynge, Antilla, Arbyn, Segnan, & Ronco, 2009). Bistoletti and colleagues (2008) calculated that Pap tests with HPV-DNA testing allow for screening intervals of nine years. Longer intervals will result in a cost reduction from $319 to $261 per woman with a marginal increase in life expectancy.

At the end of 2011, the NCSP introduced HPV-DNA testing to the follow-up procedures for women treated for cervical lesions. The use of HPV-DNA testing as part of routine screening or to follow-up abnormal Pap tests is being reviewed (O'Connor, 2011). Relevant randomised clinical trials (RCT) are underway (Lynge et al., 2009)

Secondly, two HPV vaccines are now available. *Cervarix* and *Gardasil* protect against the most common high-risk types: 16 and 18. In addition, *Gardasil* also covers types 6 and 11 which are the most common causes of genital warts (Lynge et al., 2009). Lynge et al. report RCT's finding that the vaccines protect women without previous HPV infection to just under 100 percent from CIN 2 or worse outcomes. Women with previous HPV infection receive protection to up to 55 percent against HPV types covered by the vaccine and up to 20 percent against all HPV types. The authors thus advise public health providers to focus vaccination on females before sexual initiation for maximum benefit (Lynge et al., 2009). In their review, the Health Information and Quality Authority (HIQA, 2008) recommends that HPV vaccination in Ireland should concentrate on 12-year-old girls with a catch-up programme for 13- to 15-year-olds. The Irish vaccination programme commenced in May 2010 (Corcoran, 2012).

Given less than complete vaccination coverage and the lack of vaccine-protection against some carcinogenic HPV types, however, this strategy can only be a supplement to Pap test screening rather than an alternative (HIQA, 2008; Bodily & Laimins, 2011; Lynge et al., 2009). Lynge and colleagues (2009) also point out that approximately another 50 years will pass until the last pre-vaccination birth cohort ceases cervical screening. Thus, for the foreseeable future, Pap testing is indispensable in cervical cancer prevention.

Concluding remarks

This chapter introduced cervical cancer as a debilitating illness that appears to be more easily prevented than treated. Without screening, cervical cancer is prevalent and affects women in the most productive years of their lives. Presently, the best understood and most cost-effective method of prevention is the Pap test. Cervical screening reduces spending and also physical and psychological suffering.

The full benefits of the Pap test, however, remain unrealised. Figures of quality assured programmes (NCSP, 2010, 2011b) and screening coverage (Anttila, von Karsa, et al., 2009; NCSP, 2011b) suggest that this is due to lacking coverage rather than lacking quality. Cervical screening avoidance significantly lessens the effectiveness and cost-effectiveness of organised cervical screening programmes (O'Connor et al., 2014). Although the NCSP received several awards for their screening information campaign, they acknowledge their target coverage of 80 percent as a challenge (NCSP, 2011b). This project sets out to investigate how theories of health behaviour and behaviour change can meet this challenge.

Chapter 3

Who attends for a Pap test? A systematic review of influences on cervical screening uptake

~ Study 1~

An extensive body of primary research exists that investigates influences on cervical screening attendance. These include cross-sectional, longitudinal and intervention research. This systematic review aims to summarise the literature that presents this evidence, with the object of answering the research question:

What influences might affect cervical screening uptake in Ireland?

Ellis and co-authors' (2003, 2005) synthesis of 13 systematic reviews of cervical screening interventions grouped these studies into provider-directed, patient-directed, access-enhancing, media education, policy-level, and multi-strategy interventions. This research project, however, focuses on how psychology explains individual health behaviour. Therefore, this review examines patient-level characteristics, while provider-directed and policy-level interventions will be relevant only in as far as they exert social influence on women. Ellis and colleagues (2003, 2005) found that the most effective interventions were screening invitations and reminders, interventions that reduced financial barriers and multi-component strategies combining any of the above. The effectiveness of patient counselling and education was inconsistent, while there was insufficient evidence to conclude anything about the effect of media campaigns. No reviews were found on interventions using financial incentives, reducing access barriers, providing a social network, or working at policy-level (Ellis et al., 2003, 2005)

Method

Search strategy. The search strategy was developed in accordance with the recommendations of Higgins and Green (2008) and refined in consultation with a subject librarian at UCC. The following search terms[2] were used. Each section was connected with AND.

[2] Databases will search for any word with the word-stem before *, plurals were included in the searches automatically

- cerv* OR carcinoma OR cancer OR intraepithelial OR neoplas* OR uter*
- utili*ation OR compliance OR adherence OR attendance OR decision OR non*attendance OR acceptance
- prevention OR screening OR trends OR smear OR control OR early OR detection OR Pap* OR test* OR exam*
- predict* OR variable OR determin* OR factor OR associat* OR influence OR affect OR impact OR motiv* OR antecedent OR caus* OR reason

The search was restricted to articles published after 1959. Although Papanicolau developed the Pap test in 1948, screening programmes were unfeasible then due to a lack of trained medical personnel (Arbyn, Rebolj, et al., 2009). The first cervical screening programmes commenced in the 1950s and 1960s (Bryder, 2008; Linos, Riza, & Ballegooijen, 2000; Ronco & Anttila, 2009) and scientific evaluations of these were first published between 1960 and 1980 (Ronco & Anttila, 2009). 1960 as the earliest publication date is therefore a very conservative cut-off.

For databases that yielded a very large number of articles, the search was limited to the subject or index term or title, abstract and keywords, depending on the options of the database. I searched 15 databases: Academic Search Complete, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Psychology and Behavioural Science Collections, PsychArticles, Social Sciences Full Text, SocIndex, Cochrane Library, Directory of Open Access Journals, Medline, Informa Health Care, PsycInfo, PubMed, Science Direct, Scopus and Springer Link. According to Higgins and Green (2008), searching a range of databases reduces the likelihood of missing relevant publications and further lowers selection bias. The database searches identified 12,219 citations. Removal of duplicates decreased their number to 9,770.

Inclusion criteria and study selection. Further studies were excluded in an abstract review according to the following inclusion and exclusion criteria. Peer-reviewed research was included if it:

- measured Pap test attendance or avoidance as an outcome variable
- focused on female patients eligible for a Pap test in the studied country
- employed at least a cross-sectional design (i. e. interventions, systematic reviews and meta-analyses were also included)
- studied variables specific to the patient as opposed to the smear taker or the screening system

Similar to Ellis and collaborators (2005) we identified a large number of studies. Four thousand and seventy-five articles remained for systematic review. Higgins and Green (2008) argue that broad inclusion criteria for study designs allowed for a comprehensive summary; nevertheless a research question with such extensive scope would be better suited to a review of reviews. As in the case of Ellis and colleagues' (2003; 2005) study, the review was consequently restricted to previous systematic reviews and meta-analyses. These were extracted from the remaining 4075 articles using Endnote. Titles and abstracts were searched for those containing the terms *meta**, *review,* or *effect** to signify synonyms of meta-analytic studies of intervention effects and systematic reviews. To ensure these studies focused on the prevention of or screening for cervical cancer, the studies also had to reference any one of the terms *cerv*, cancer, carcinoma, smear, Pap*, screen** or *prevent**. The search produced 518 articles, which were screened in 3 steps.

Firstly, I reviewed the titles and abstracts of these publications with the help of an independent reviewer, as advocated by Higgins and Green (2008). The inter-rater reliability for the reviewers was found to be $\varkappa = .91$ ($p < .001$, 95% CI [0.85, 0.96]). According to Higgins and Green this value suggests excellent inter-rater agreement. As advised by Higgins and Green, we revisited the abstracts to discuss differing decisions until agreement. Orwin (1994) explains that this strategy is advantageous as it can uncover details missed by one reviewer and thus achieve consensus. Reviews were kept for full-text screening if their abstract or title:

1) indicated analyses for cervical screening as a separate outcome variable AND
2) referred to itself as a systematic review or meta-analysis OR
3) called itself a review AND described a search strategy

The first criterion eliminated reviews that combined the results of studies on cervical screening with studies of other behaviours. The latter criteria distinguished between reviews and other types of studies. Seventy-nine publications remained after title and abstract review.

Secondly, another independent reviewer and I screened these 79 full-text articles for the following inclusion criteria:

- reports search terms
- lists databases searched
- reports explicit inclusion (or exclusion) criteria
- part or all of the study population are eligible female patients
- part or all of the reviewed studies used at least cross-sectional designs
- part or all of the studied outcomes are Pap test attendance
- results present *separate* analyses for Pap test attendance of eligible female patients of at least cross-sectional studies

Furthermore, reviews were excluded if all of the included studies assessed organisational or health care provider variables or if the review included previous systematic reviews or meta-analyses.

The aim of this review is to inform about patient characteristics that predict Pap test uptake, therefore client-centred analyses were vital. We avoided qualitative findings, as their representativeness is questionable—especially in reviews that fail to report sample sizes. Reviews that partly reported on qualitative studies or physician-centred predictors, however, could still be included in this review of reviews provided the analysis for the desired types of studies was clearly distinguishable.

Search terms and databases lists were required to distinguish systematic reviews from other types, e.g. literature reviews. Ellis et al. (2003) defined a review as systematic when the authors reported inclusion criteria, the databases searched and the number of included articles. Where the reviewers had failed to provide these, I contacted them by email. The number of included studies can be assessed for any review—systematic or not—by mere citation count; this task was part of the data extraction, but had no bearing on the inclusion criteria; otherwise I would have been unable to include empty reviews, which found a lack of evidence.

For studies that failed to report search terms or inclusion criteria (Akers, Newmann, & Smith, 2007; Aldrich & Hackley, 2010; Baron, Rimer, Coates, Kerner, Kalra, et al., 2008; Boucher & Schenker, 2002; Bukowska-Durawa & Luszczynska, 2014; Garcés, 2006; Lee-Lin & Menon, 2005; Lovejoy, 1996; Marcus & Crane, 1998; Newmann & Garner, 2005; Stone et al., 2002; Wisdom et al., 2010), the authors were contacted, and their review included, if the authors could provide this information. Of the eight authors who replied to us (Baron, Rimer, Coates, Kerner, Kalra, et al., 2008; Boucher & Schenker, 2002; Bukowska-Durawa & Luszczynska, 2014; Lee-Lin & Menon, 2005;

Lovejoy, 1996; Newmann & Garner, 2005; Stone et al., 2002; Wisdom et al., 2010) four were unable to provide the required details (Baron, Rimer, Coates, Kerner, Kalra, et al., 2008; Boucher & Schenker, 2002; Lee-Lin & Menon, 2005; Lovejoy, 1996). Therefore, these studies had to be excluded. Stone and colleagues clarified that their publication reported the same review as Shekelle et al. (1999) and their findings and methods will be reported in conjunction.

The reviewers worked independently of each other and, referring to the full-text, discussed disagreements until a consensus was found (Higgins & Green, 2008; Orwin, 1994). The inter-rater reliability for the inclusion decisions was $\kappa = .19$ ($p = .12$, 95% CI [-0.03, 0.40]), which suggests poor inter-rater agreement (Higgins & Green, 2008).

In the third step, full-text articles were read in detail to record study details and findings according to the data extraction tool. At the same time, the studies were assessed for their quality using the quality assessment tool. Two reviewers worked independently. Disagreements were discussed until consensus was reached (Higgins & Green, 2008; Orwin, 1994). In this step three reviews (Forbes, Jepson, & Martin-Hirsch, 2009; Jepson et al., 2000; Task Force on Community Preventive Services, 2008) were excluded because updates of these were available (Everett et al., 2011; Ferroni et al., 2012; Sabatino et al., 2012) and already included as eligible studies.

Materials. I developed a data extraction tool (cf. figure 3.1 in Appendix A, p. A – 2) in accordance with the guidance provided by Higgins and Green (2008). The extraction tool gathered information about the search procedure, number and types of studies, the range of publication languages and years, characteristics of the total sample as well as definitions and operationalisations of the independent and the outcome variables. Findings were reported in a table format (cf. table 3.1 in Appendix A, pp. A – 3) that categorised independent variables by the conclusion that the reviews had drawn:

- associated with Pap test attendance
- associated with Pap test avoidance
- no association
- inconclusive evidence
- insufficient/ no evidence

The quality assessment took the form of a checklist as recommended by Centre for Reviews and Dissemmination (CRD, 2008). According to Higgins and Green (2008)

however, research on the quality assessment of systematic reviews is limited. The authors are unable to provide guidelines. They point instead to the tools used by Oxman (1994) and Shea, Boers, Grimshaw, Hamel, and Bouter (2006). Oxman presents a checklist of 11 items in accordance with a number of articles dealing with the quality assessment of systematic reviews. Shea and colleagues used the Overview Quality Assessment Questionnaire (OQAQ) and an 18-item survey derived from the Quality of Reporting of Meta-analyses (QUOROM) statement. The QUOROM survey is geared particularly towards the assessment of meta-analyses and the OQAQ has been more widely researched and validated according to Shea et al. Therefore we focused on the latter questionnaire in the design of a quality checklist for this study. In addition, we referred to the CRD's strict quality criteria. The National Institute for Health and Clinical Excellence (NICE) has published a systematic review of guidelines to conduct systematic reviews (Sanders & Kitcher, 2006) and Russell, Di Blasi, Lambert, and Russell (1998) provide a quality scoring sheet based on the CRD guidelines from 1996 and previous authors' recommendations (L'Abbe, Detsky & O'Rourke, 1987; Thacker, Peterson & Stroup, 1996 as cited in Russell et al., 1998). Ellis and colleagues' (2003) review of reviews used a well-established tool from the Effective Public Health Practice Project (Ellis et al., 2003, 2005). Table 3.2 in Appendix A (pp. A – 9) maps the core quality criteria identified in these publications.

The criteria on which at least half of these sources (3 out of 6) agreed were selected as the criteria of my quality checklist. (cf. figure 3.2 in Appendix A, p. A – 10). I eliminated *reports databases searched* and *explicit inclusion/ exclusion criteria* from the checklist however, as all publications had to report these to fulfil the inclusion criteria for this review.

Analysis

Figure 3.3 summarises the article search in a flowchart. We identified 25 relevant publications in total.

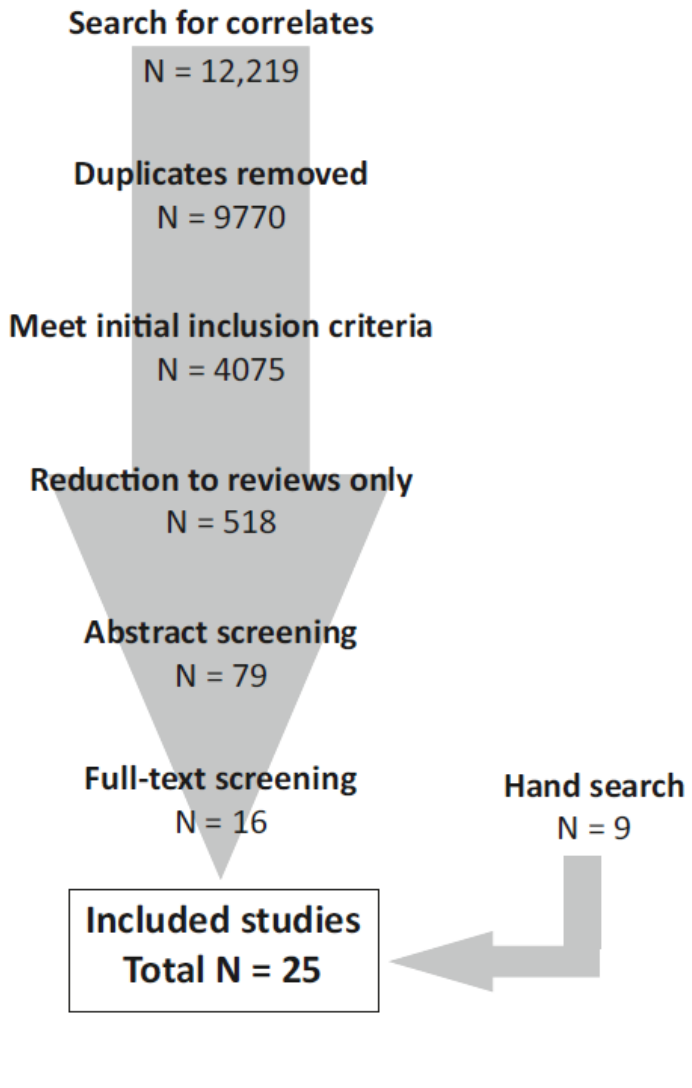

Figure 3.3. Flowchart of publication search.

Figure 3.4 displays the number of reviews retrieved for each database. An additional eight reviews were known to the researchers prior to the study. Although these reviews were also found in the database searches, they were classed as *hand-searched*. One review was found through Ellis and colleagues' (2003; 2005) review. Nine articles presented meta-analyses (Cooke & French, 2008; Corcoran, Dattalo, & Crowley, 2012; Edwards et al., 2008; Everett et al., 2011; Ferroni et al., 2012; Han et al., 2011; Pirkis, Jolley, & Dunt,

1998; Tseng, Cox, Plane, & Hla, 2001), one of which was covered by two reports (Shekelle et al., 1999; Stone et al., 2002).

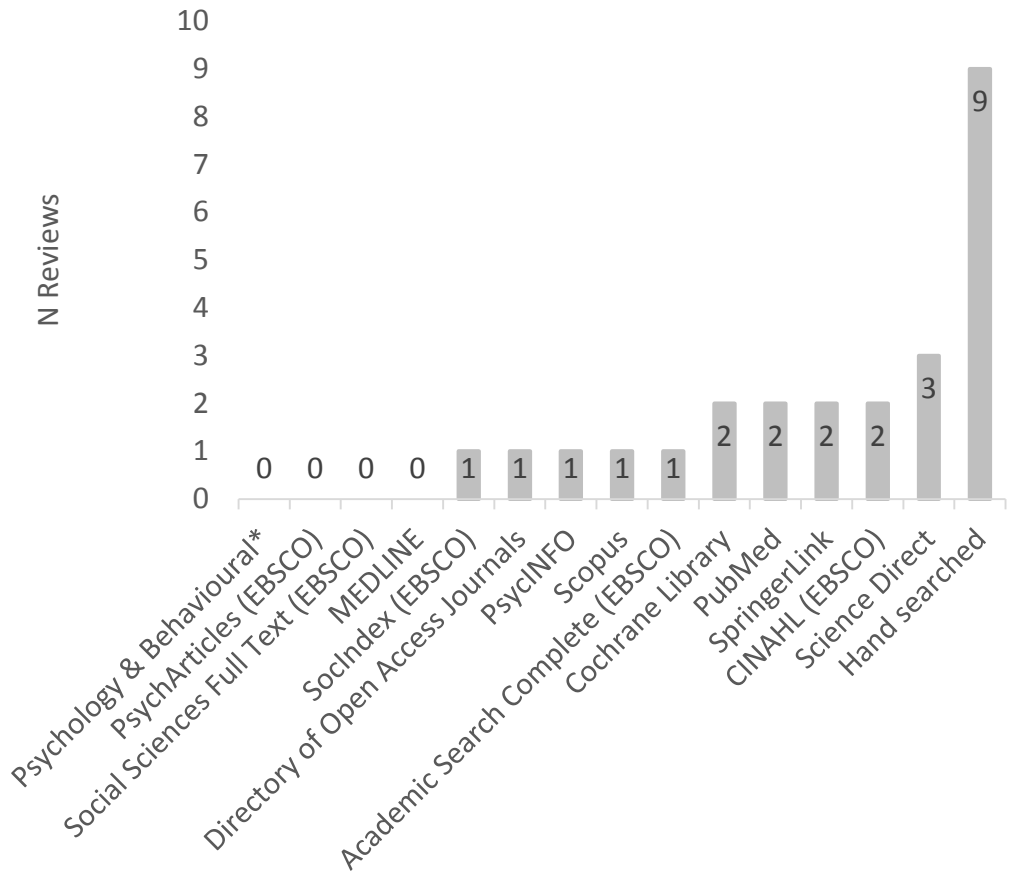

Figure 3.4. Number of included reviews, Data range: 1996 – 2013. * Psychology and Behavioural Science Collections (EBSCO)

Quality Assessment. Figure 3.5 shows the frequency with which each of the quality criteria was met across the studies. All studies present a focused research question and grounded their conclusions in the reviewed evidence. Quality assessments and expert consultation are the most infrequently met criteria. Three studies failed to specify search terms. All but one study each provide meta-analytic or narrative syntheses of their findings, report explicit inclusion criteria, or followed up bibliographies for further sources.

Table 3.3 (Appendix A, pp. A – 11) summarises the quality assessments for each study. Five reviews of moderate quality fulfil five criteria and 20 high-quality reviews meet six to eight criteria. Table 3.4 (Appendix A, pp. A – 12) summarises the studies' details.

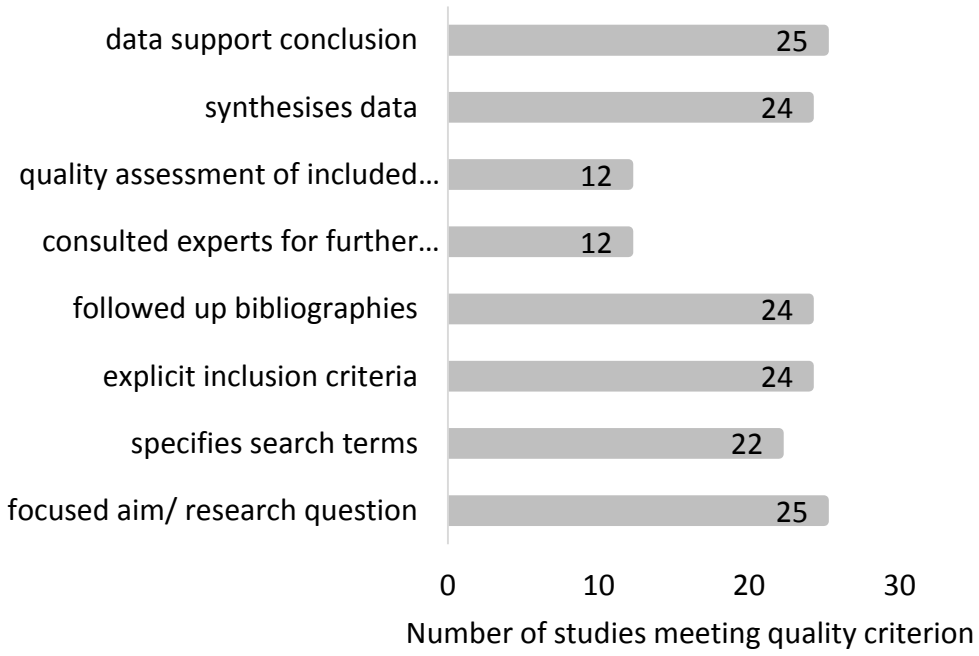

Figure 3.5. Frequency of quality criteria

Narrative synthesis. Previous systematic reviews and meta-analyses have summarised the evidence on a substantial number of patient-level associations with cervical screening attendance. They form two clusters at different levels of analysis (Holt et al., 2009): predictors at the environmental level are concerned with socio-demographics, health-related risk factors for cervical cancer, and access issues; and predictors at the psychological level focus on social interactions, screening promotion, level of understanding of the Pap test, and intra-individual predictors. Figure 3.6 shows the frequency with which each topic had been reviewed. The most frequently reviewed areas were screening promotion, level of understanding and ethnicity. Although ethnicity is a socio-demographic characteristic, twice as many reviews focused on ethnicity as on other socio-demographic variables combined. To accommodate the great detail of information my review examined ethnicity separately from other socio-demographic variables. In addition to the remaining reviews of socio-demographics, those of access issues and health risk factors were the least frequent.

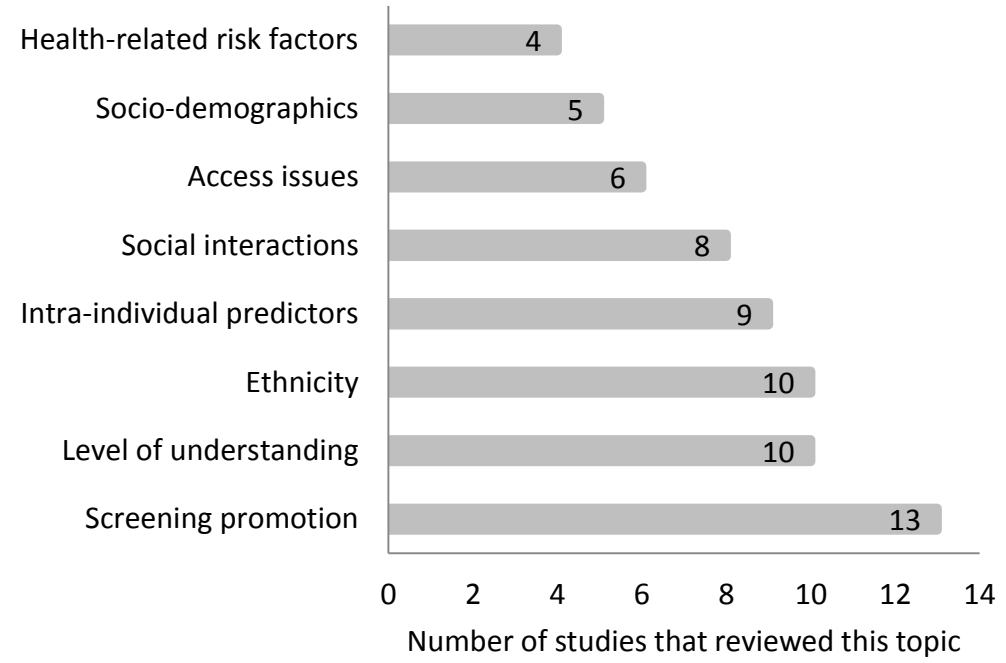

Figure 3.6. Frequency of reviewed topics

Socio-demographic characteristics associated with health-care deprivation.

Although socio-demographic information is highly accessible and routinely assessed in primary research, we identified only five reviews that collate this evidence. These reviews focus on associations with age, socio-economic status, health insurance and rural versus urban dwellers.

"Research about age and cervical cancer uniformly revealed a differential [favouring] younger women along all domains of the cervical cancer continuum…" (Newmann & Garner, 2005, p. 66). Younger women have been found to have lower mortality rates, to be diagnosed at an earlier disease stage and to be more likely to attend for treatment and screening (Newmann & Garner, 2005; Yabroff et al., 2005). Older, and often post-menopausal, women might be unsure whether they require cervical screening and are therefore less likely to participate (Fylan, 1998).

Furthermore, Newmann and Garner (2005) find that higher income is associated with screening attendance, while Shekelle and colleagues (1999) had insufficient data to test whether income level affected their meta-regression. Socio-economic status (SES) is frequently used synonymously with income; however, Newmann and Garner also report two studies of homelessness as a predictor of cervical screening. While one found homeless women to be less likely to attend than the general population, the other found

no difference. In addition, Yabroff et al. (2005) also list low education level as one of the predictors of non-attendance for Pap testing.

Moreover, Pruitt and collaborators (2009) present a detailed review of the effect of individual and area-based SES. They report that less educated women living in highly educated areas are less likely to obtain Pap tests than women of the same education level living in less educated areas, which might indicate a social or infrastructure effect. In one study area poverty was negatively correlated with Pap test uptake, but the interaction of area poverty and individual income level was non-significant (Pruitt et al., 2009). The authors summarise the reviewed SES literature as sparse and consisting of small studies conducted in homogenous geographic areas. They would have liked researchers to control for more area-based covariates of SES and to perform multi-level analyses. They report finding positive, negative, non-significant correlations with Pap test uptake, and interactions of these predictors. They therefore consider the research to be inconclusive in its present shape (Pruitt et al., 2009)

Furthermore, reimbursement of health care cost is related to the association of economic deprivation and health disparities. Shekelle and co-authors (1999) were unable to identify studies comparing insured and uninsured populations, but later research finds that private or good quality health insurance was particularly predictive of screening uptake (Newmann & Garner, 2005). Newmann and Garner also report a marked decrease in new cervical cancer diagnoses after Medicare coverage of cervical screening was introduced in California, USA. These findings suggest that the effect of health insurance is probably moderated by the extent to which health insurance can provide financial relief. Additionally, Yabroff and associates (2005) find that lack of health insurance is also associated with increased frequency of cervical cancer risk factors. Thus, one may speculate that health insurance is predictive of cervical screening through an unrelated variable: general health motivation might predispose women to afford health insurance, but also, independently of this, to obtain Pap tests.

Socio-economic deprivation leading to health disparities appears to be more common in rural areas (Yabroff et al., 2005). Newmann and Garner (2005) add that cervical cancer risk factors and cervical cancer mortality have been found to be higher in rural settings, but they fail to identify evidence in relation to screening uptake. In a moderator analysis, Shekelle et al.'s (1999) meta-regression was also unaffected by rural setting. Yabroff and associates (2005) caution that the findings they reviewed were derived from large samples, such that the actual differences in uptake, although statistically significant,

are rather small: like the 3.2 percent difference found by Coughlin, Thompson, Hall, Logan and Uhler (2002, as cited in Yabroff et al., 2005)

Socio-demographic associations with Pap test uptake appear to be related to health disparities that result from socio-economic deprivation. Low SES and lacking health insurance result in reduced access to medical care, which includes cervical screening services. Older women and rural dwellers might experience this effect more frequently. However, socio-demographic predictors could be moderated also by racial and cultural differences (Newmann & Garner, 2005), which are considered next.

Ethnicity as a predictor of screening attendance. Lu and colleagues (2012) reviewed interventions to increase cervical screening attendance among Asian populations in their country of origin or abroad. They note that similar interventions varied in their success depending on the ethnicity of target population. Reviews of ethnicity present a complex picture. The association has been most frequently researched in US populations (Newmann & Garner, 2005; Shekelle et al., 1999). African-American women appear to be at least as likely to obtain a Pap test as Caucasian women in the US (Newmann & Garner, 2005; Yabroff et al., 2005), whereas Native American (Newmann & Garner, 2005), and Hispanic (Yabroff et al., 2005) women seem to be less likely to attend for Pap tests than Caucasian women. In the UK, Fylan (1998) finds that particularly Asian minority women are less likely to attend for Pap tests. Norredam and colleagues (2010) review three European studies and find that migrant women are less likely to obtain Pap tests than women born in the studied countries.

Migrant women are often assessed on their degree of acculturation, which is frequently operationalised as the number of years spent in the country or proficiency in the first language of the country, e.g. English in the US (Newmann & Garner, 2005; Fylan, 1998). These measures appear to be more significant predictors of screening attendance than actual ethnicity (Yabroff et al., 2005).

In accordance with this reasoning, culture-specific beliefs, e.g. fatalism, might impede Pap test attendance. Looking at fatalistic beliefs in more detail, Espinosa de los Monteros and Gallo (2011) report that in some studies, fatalistic beliefs predicted non-attendance for Pap tests when SES, education and acculturation were controlled. Other studies failed to find significant associations with non-attendance; instead fatalism correlated with low socio-economic status, education and acculturation (Espinosa de los Monteros & Gallo, 2011). The authors lament the lack of consistency in the

measurement of fatalism and point out the inconclusive nature of their evidence (Espinosa de los Monteros & Gallo, 2011).

Fylan (1998) explains that attuned health care providers would encourage screening uptake by countering cultural and social norms of ethnic minorities that conflict with cervical screening advice. Meta-analyses of culturally tailored interventions tested this idea (Corcoran et al., 2012; Han et al., 2011; Yabroff, Mangan & Mandelblatt, 2003). Corcoran and colleagues find no significant effect of culturally appropriate interventions on Pap test attendance; but Han and co-workers report a significant increase in screening following interventions with culturally appropriate materials or treatment deliveries. Yabroff and colleagues' (2003) conclusions are more equivocal: whereas culturally tailored and lay health worker interventions led to significant increases in attendance (by 6.5 percent), a media-based role model intervention had no effect on attendance.

Overall, the evidence supports the association between ethnicity and screening uptake. Whether this is a direct relationship, however, or one mediated by other factors is less clear. Ethnicity is interwoven with socio-economic and cultural differences such that causal pathways have been difficult to establish.

Associations with health-related risk factors. It is particularly important that women at higher risk of cervical cancer attend for regular Pap tests. At the same time, women who attend cervical screening will presumably also be motivated to engage in other health-promoting behaviours, thereby reducing their risk of cervical cancer and other illnesses.

Lifestyle risk factors for cervical cancer include higher number of lifetime sexual partners, more frequent parity, and long-term oral contraceptive use (Berrington de Gonzáles, Sweetland & Green, 2004; Hemminki & Chen, 2006). Yet, no reviews which focused on such risk factors could be included here.

Women with a recent health care visit were more likely to have had Pap tests (Yabroff et al., 2005). This association appears to be related to the likelihood of receiving a physician recommendation of the test, the accessibility of primary care physicians and having a regular source of care (Yabroff et al., 2005). Alternatively, regular health care visits could be an indicator of general health motivation, which may mediate this relationship with screening attendance. Disabled women, however, who may see physicians more regularly, were less likely to be screened. Two reviews found mental and physical disabilities to be negatively associated with cervical screening (Newmann &

Garner, 2005; Wisdom et al., 2010). Newmann & Garner suggest that the Pap test was more difficult to perform with disabled women; but Wisdom and co-authors expect worse health outcomes in disabled women generally, and consider disability as a source of health disparity in its own right.

Furthermore, weight has been associated with cervical screening attendance. Especially among African-Americans, underweight women were less likely to attend cervical screening (Cohen et al., 2008). Heavier weight was also associated with screening avoidance; but this association was less consistent among African American women compared to Caucasian women (Cohen et al., 2008). Cohen and colleagues explain that African American women differ in their perception of body shapes and prefer larger body size. They might, therefore, be less fearful of weight stigma. Nevertheless, their review includes a study of African American women with higher-than-average SES for this population and finds a similar association of overweight and screening avoidance as in Caucasian women (Cohen et al., 2008). This may have resulted from differential acculturation, but Cohen and colleagues report that substantial methodological differences between their reviewed studies prevent more definite conclusions.

The relationships of cervical cancer risk factors with cervical screening attendance have been poorly assessed. Associations with other behaviours that affect health appear to be mediated by access issues and stigmatisation. There is also an argument that healthy behaviours are manifestations of an interest in health that leads to screening attendance.

"If you build it, he will come" (Frankish & Robinson, 1989). So far it is clear that accessibility to cervical screening is affected by socio-economic and social pressures. For instance, Han and colleagues' (2011) meta-analysis of access-enhancing interventions included those that reduced infrastructural, financial or linguistic barriers to cervical screening. They found that, compared to other strategies, access-enhancing interventions were most effective: if women were enabled to attend Pap tests, they took the opportunity.

Similarly, rural women's screening avoidance may be explained by "living in an area with fewer primary care providers" (Yabroff et al., 2005, p. 153). Sabatino and co-authors (2012) argue, however, that the available evidence on facility provision is of insufficient quality to draw any conclusions.

Two reviews investigated the effect of financial cost on screening, but were unable to identify suitable interventions of reducing patients' expenses (Everett et al., 2011;

Sabatino et al., 2012). Moreover, offering financial incentives to patients who attend for cervical screening was a very successful intervention strategy in one meta-analysis (Shekelle et al., 1999; Stone et al., 2002), while Sabatino and co-workers were also unable to identify suitable studies of patient incentives.

Furthermore, Yabroff and co-workers (2005) find that lacking time to attend is a commonly reported barrier to Pap test uptake. Fylan (1998) explains that appointments restricted to office hours are unsuitable for many women. The evidence on time constraints is limited, but, as ever, begs the question whether women are unwilling or unable to make time for Pap tests.

The accessibility of Pap tests also appears to be considerably increased for women who have a consistent source of care, e.g. a GP, gynaecologist or practice nurse (Yabroff et al., 2005). Yabroff and colleagues (2005) also point out that women without a regular source of care were more likely to experience cervical cancer risk factors. These findings suggest that, similar to risk-behaviour predictors, the association of having a regular source of care may be moderated by a more general interest in health.

Accessibility appears to be influenced by the physical availability of cervical screening and health care in general, but also by its cost and suitable appointment times. While women commonly cited these issues as reasons for Pap test avoidance, reviews of interventions to address them report only inconsistent success.

This section concludes the review of the foundations of access issues. The evidence confirms Hart's (1971) Inverse Care Law[3]: particularly among socio-economically and socially marginalised women there is scope to enable screening attendance through changes in service provision. Nevertheless, some evidence indicates that where access is given, social and intra-personal consideration will affect screening attendance. These influences will be discussed in the remaining sections.

Providing information to increase screening attendance. A wealth of cross-sectional evidence points to lack of understanding of the value of the Pap test, of cervical cancer, and its risk factors among women who avoid cervical screening. Cervical screening promotion and uptake interventions also frequently rely on information provision. Both types of evidence are addressed by several reviews.

In cross-sectional research women with more information about the Pap test and cervical cancer are more likely to attend for cervical screening (Fylan, 1998). Newmann and Garner (2005) look at the broader concept of health literacy—a person's ability to

[3] Those patients who avoid preventive health care need it the most (Hart, 1971).

obtain and understand information about aspects of their health (Akers et al., 2007). They conclude that screening information was presented at a high level of health literacy and women with low health literacy were less informed about the Pap test and might be less likely to attend for one. The association, however, was primarily found in at-risk populations.

Fylan (1998) further found that women with more information about the risk factors of cervical cancer were more likely to obtain a Pap test. Albada and co-workers (2009), cite one study which suggested that increased risk information may impede screening attendance; but Albada and colleagues argue that this is insufficient evidence to conclude anything about a possible association. We found no reviews that assessed the association of information levels about HPV and Pap test uptake.

While the cross-sectional evidence shows that information predicts screening attendance, the results of educational interventions to increase information levels and screening uptake are mixed (Everett et al., 2011; Sabatino et al., 2012). Several reviews find effective educational interventions (Everett et al., 2011; Han et al., 2011; Lu et al., 2012; Sabatino et al., 2012; Shekelle et al., 1999; Stone et al., 2002; Viswanathan et al., 2009), but often they concluded that other intervention strategies were more successful (Han et al., 2011; Shekelle et al, 1999; Stone et al., 2002; Viswanathan et al., 2009). Other reviewers, however, deemed the available evidence of insufficient quality to come to any conclusions (Corcoran et al., 2012; Sabatino et al., 2012).

Nevertheless educational interventions were often combined with other strategies. While Lu and colleagues (2012) find that patient education was most effective in combination with access-enhancing strategies. Yabroff and colleagues (2003) conclude that posted educational material combined with screening invitations had no significant effect on screening rates, but invitations with a phone call from a screening educator did improve screening uptake. In contrast, Everett and colleagues (2011) find no difference for invitation letters and patient education compared to invitations only.

According to Fylan (1998) though, women do desire more information about cervical screening. She argues for the value of *perceived* level of information. Thus, women who felt sufficiently informed were less anxious and more likely to attend for cervical screening. Fylan also presents evidence, albeit in relation to colposcopy attendance, that women obtain information about the Pap test from friends with prior experience; but we could not identify systematic reviews on the informational significance of social support.

In summary there appears to be a gap in particular between the conclusion of cross-sectional and experimental findings: cross-sectional evidence suggests that better informed women are more likely to attend for Pap tests, whereas intervention studies appear to find, at best, that other strategies are more effective than patient education. This could indicate that increased knowledge about cervical cancer is a *result* of screening attendance rather than a cause.

Social interactions in relation to cervical screening. Despite being a very private concern, cervical screening occurs in a social context. This includes the interpersonal relationship of health care, but also the patients' wider social environment.

For instance, doctors with greater patient loads appear to be less likely to recommend Pap tests leading rural women to fail to attend for screening (Yabroff et al., 2005). This may be one explanation for why physicians neglect to recommend screening. No reviews were found, however, that examined the association of screening uptake with the quality of the health care.

Several reviews suggest that access to a female smear taker would improve screening attendance. Female physicians have been found to be performing more Pap tests than their male colleagues (Newmann & Garner, 2005). Fylan (1998) concludes that women will avoid cervical screening if no female smear taker is available. Male physicians reported being asked for referrals for Pap tests more frequently and experiencing patients' embarrassment as a stronger barrier to cervical screening (Newmann & Garner, 2005). This evidence suggests that social relations during the Pap test affect attendance.

The broader interpersonal environment possibly also influences cervical screening uptake. Several studies have reviewed the effect of social support in relation to health care matters. Everett and colleagues' (2011) finding that lay health workers can improve the effectiveness of educational interventions appears to support this argument. In meta-analysis, peer support was nevertheless the least successful way to increase screening uptake (Han et al., 2011). Shekelle and colleagues' (1999) meta-regression also finds that the use of social influence decreased the effectiveness of interventions. Viswanathan and colleagues (2009) find that lay health workers were as effective as alternative strategies in interventions of low or moderate intensity, but less effective in high-intensity interventions, while Yabroff et al. (2003) conclude that the best use of peer support interventions is to enhance the effectiveness of other strategies.

In summary, quality of care, in the form of screening recommendations from physicians and doctor – patient relationship might affect uptake rates, as does the

availability of female smear takers. The influence of social support on cervical screening attendance has been researched mainly in terms of lay health worker interventions, the effectiveness of which have received limited support overall.

Promotion of cervical screening. In many countries cancer prevention agencies attempt to improve coverage through screening promotion. Two common strategies are Pap test invitations and reminders for patients and mass media campaigns.

Considerable attention has been given to studies of patient invitations and reminders, which are frequently found to facilitate Pap test attendance (Pirkis et al., 1998; Shekelle et al., 1999; Yabroff et al., 2003). Only Everett and colleagues (2011), however, distinguish patient invitations from patient reminders and they fail to identify reminder interventions adhering to their definition. In light of this it makes pragmatic sense to combine the findings of patient invitations and reminders, as most reviews have done already.

Recent meta-analyses find that written invitation letters were associated with screening uptake, as were telephone invitations and letters with assigned appointments (Everett et al., 2011; Ferroni et al., 2012). Telephone invitations appeared to have a greater effect than written invitation letters or usual care (Everett et al., 2011; Ferroni et al., 2012; Yabroff et al., 2003). Invitation letters from GPs appeared to have more of an effect than generic letters (Shekelle et al., 1999) or invitations from other authority figures: the effect of celebrity-endorsed invitation letters was non-significant compared to no-treatment control (Everett et al., 2011; Stone et al., 2002). Curiously, face-to-face invitations had no effect on screening uptake compared to letter invitations and no-treatment control. But, as only one study reported on face-to-face invitations in Everett et al.'s review, the evidence is limited. Furthermore, Tseng et al. (2001) find that invitation letters had less of an effect on participants of low SES. The effect of screening reminders appeared to improve also if reminder interventions were enhanced by information provision about screening and its benefits and by help with overcoming screening barriers or making appointments (Sabatino et al., 2012; Stone et al., 2002).

In contrast, Kupets and Covens (2001) report that only one of their four reviewed studies of patient reminders showed a significant effect on attendance. According to that study (Somkin et al., 1997 as cited in Kupets and Covens, 2001) one in ten women will respond to a screening reminder, whereas another (Clementz et al., 1990 as cited in Kupets and Covens, 2001), reported a non-significant decrease in attendance by ten percent following the screening reminder.

The reviews of mass media campaigns are less conclusive overall (Everett et al., 2011; Sabatino et al., 2012; Stone et al., 2002). Shekelle and colleagues (1999) identified two mass media studies, but felt unable to draw any conclusions about their effectiveness. The large sample sizes prevented the researchers from including these studies in their meta-regression. Further, they explain that mass media campaigns were commonly used in combination with other strategies (Shekelle et al., 1999). Baron, Rimer, Breslow and co-authors' (2008) meta-analysis of interventions using videos and printed material in health care or community settings finds these strategies to effectively increase Pap test uptake. Although Sabatino and co-authors describe three mass media interventions that were able to increase screening attendance, they consider this an insufficient amount of evidence to draw any conclusions about the effects of mass media campaigns. Corcoran and colleagues' (2012) included two mass media studies, but their meta-analysis finds no significant effect. Similarly, Lu and collaborators' (2012) review concludes that mass media interventions were ineffective at increasing Pap test uptake among Asian women. Han et al.'s (2011) meta-analysis finds mass media interventions to improve screening rates, but to be the second least effective of the five strategies tested. Meanwhile Everett and collaborators report a photocomic study that had no significant effect; but they review a study of televised media interventions that increased screening uptake, similar to a study of media education. Its effect was enhanced by lay health workers.

Across different strategies Shekelle and colleagues (1999) investigated factors that made cervical screening promotion more successful. They found that high visual appeal and the use of active learning strategies—presumably in material and intervention design—improved the effect of screening promotion.

According to Yabroff and colleagues (2005) women explained their failure to screen with reference to forgetting to do so. Arguably patient invitations, but also mass media campaigns can be seen as cues to action that counteract forgetting. Patient invitations and reminders appear to have a beneficial effect on uptake rates. More research distinguishing between the two is required, however. Overall it appears that *how* rather than which intervention strategies are used has a greater influence on their success.

Psychological explanations of screening attendance. This section is concerned with intra-personal predictors of Pap test uptake. Some of these have been summarised as variables of theories of health behaviour (THB). Others include individual differences, such as intelligence or personality.

In a review of TPB Cooke and French (2008) report a meta-analysis of bivariate associations of uptake intention and cervical screening attendance. The authors conclude that screening intentions predict attendance. Cooke and French also examined perceived behavioural control (PBC), which predicted cervical screening attendance. Grounding their meta-analysis firmly in the causal claims of TPB, they further review the association of subjective norms and attitudes with screening intention—which were both significant—but not with actual uptake (Cooke & French, 2008).

In relation to the Health Belief Model (HBM), Fylan (1998) concludes that strong perceived susceptibility, benefits and internal locus of control (LoC) predict cervical screening attendance. Fylan's is the only included review that examines LoC, although the association of avoidance with fatalistic beliefs (Espinosa de los Monteros & Gallo, 2011)—which can be considered similar to external LoC—corroborates Fylan's findings. Her conclusions on benefits are supported by Yabroff and colleagues (2005). Everett and colleagues (2011) review a study comparing gain-framed (benefit of attendance) video messages to loss-framed (cost of avoidance) video messages. Although the study (Rivers, Salovey, Pizzaro, Pizzaro and Schneider, 2005 as cited in Everett et al., 2011) reported a significant increase in screening uptake in the gain-framed conditions at a 6-month follow-up, Everett and colleagues report no significant differences. An explanation for this discrepancy may be the considerable bias which the reviewers found in the study—such as incomplete outcome data due to attrition—or the lack of significant differences at 12-months follow-up reported by Rivers et al. (2005 as cited in Everett et al., 2011). In another study patients who had a health promotion nurse conduct a risk factor assessment were more likely to attend for cervical screening than patients who received usual care by their GP (Robson et al., 1989 as cited in Everett et al., 2011). Everett and colleagues, however, argue that methodological bias and heterogeneity in the data prevent them from drawing any definite conclusions.

Furthermore, Fylan (1998) investigates the influence of women's perceptions of their needing a Pap test: those who felt that it was necessary for them to have a Pap test were more likely to obtain one. Edwards and colleagues (2008) look at interventions that compared the effects of providing personalised versus general risk information. Their findings suggest that personalised risk information more successfully encourages cervical screening uptake. Edwards and colleagues also find that personalised interventions led to more accurate risk perception and improved knowledge; but these analyses include studies applied to other behaviours as well as Pap test uptake. In contrast, the two most

recent reviews are unable to draw conclusions about the effectiveness of such risk interventions (Albada et al., 2009; Everett et al., 2011).

Moreover, Bukowska-Durawa and Luszczynska (2014) found that 75% of the interventions which they reviewed significantly increased Pap test uptake by reducing screening barriers; 100% of the cross-sectional studies investigating barrier – uptake associations included in their review found greater perceived barriers predicted Pap test avoidance. The authors conclude that screening barriers are a potent influence on cervical screening behaviour across samples differing in age, health status, socio-demographic or screening experience. Bukowska-Durawa and Luszczynska, however, combine structural and affective barriers. The significance of access barriers has been demonstrated above. Other reviewers suggest, however, that the evidence focused on affective barriers is far from unambiguous. On the one hand, embarrassment impeded cervical screening attendance (Fylan, 1998; Yabroff et al., 2005). The research on the effect of pain during cervical screening is equally unanimous. Three reviews assess a wealth of studies finding that anticipated pain or discomfort during the Pap test is associated with avoidance (Fylan, 1998; Yabroff et al., 2005). On the other hand, the evidence on the effectiveness of interventions to counter barriers is less conclusive. Everett et al. (2011) assessing three interventions of patient counselling to lower screening barriers, found that face-to-face counselling significantly increased the likelihood of screening uptake compared to no counselling or another intervention. Telephone counselling, however, failed to achieve the same effect. Albada and collaborators' (2009) review of tailored interventions based on HBM and the Transtheoretical Model (TTM) compared to no treatment finds no significant effect on Pap test attendance (Albada et al., 2009).

In addition, fears related to cervical cancer appear to prevent women from attending. Although the effect of a general tendency to worry has not been assessed systematically, fear of an abnormal test result is associated with screening avoidance (Yabroff et al., 2005). This conclusion appears to contrast the evidence on perceived susceptibility (Fylan, 1998; Edwards et al., 2008): Fylan suggests informing women of their susceptibility to cancer to increase attendance, but she later reports that fear of having cervical cancer prevents women from attending colposcopy. Perhaps the difference is in the focus on risk and need for prevention in perceived susceptibility, whereas fear of an abnormal result generates an impression of having failed to prevent and facing cancer treatment in consequence.

Although Shekelle and colleagues (1999) can report that interventions with theory-based designs resulted in greater increases in cervical screening rates, few reviews, which were deemed to be assessing intra-personal explanations, could be identified. The systematic evidence on THBs is sparse, only one review looked at TPB variables, in which intention and PBC appear to predict cervical screening uptake. With regard to the HBM, some evidence was found for the predictive power of perceived benefits, barriers, and health locus of control (HLoC).

The evidence on screening barriers and perceived susceptibility is inconsistent. A possible explanation may be that RCTs in behaviour change interventions may be more easily confounded by external variables, such as the patient – provider interaction (Han et al., 2011; Sabatino et al., 2012) or question – behaviour effects (Sandberg & Conner, 2009). In combination with the limitations of cross-sectional evidence (Ogden, 2003; Sandberg & Conner, 2009) THB variables appear to be difficult to assess adequately (Oluka, Nie, & Sun, 2014), which may explain the paucity of systematic reviews in this area. Although reviews have been conducted of, for example, the use of TPB in intervention design (Hardeman et al., 2002; McEachan, Conner, Taylor, & Lawton, 2011), such research specific to cervical screening uptake is lacking.

There is a notable absence of evidence on individual differences measures and screening uptake. This is illustrated rather than rectified by Newmann and Garner's (2005) report of lesbian women's less frequent screening uptake than heterosexual women's. The authors emphasise, however, that they were unable to identify more than one study on this issue.

Concluding remarks

We identified 25 relevant systematic reviews, the majority of which were of high quality. The inclusion of cross-sectional evidence means that this review not only updates, but expands on the findings of Ellis et al. (2003, 2005). The reviews' topics covered a wide spectrum of Pap test uptake predictors that described the interplay of environmental and psychological influences. While Ellis and co-workers (2003, 2005) were unable to draw conclusions about access-enhancing interventions, the present review presents a more complex picture. Socio-economic deprivation and foreign origin may result in health care disparities. The mechanisms in this relationship appear to be fatalistic health beliefs and inability to afford health insurance. Health care disparities lead to increased cervical cancer risk and poorer screening access due to cost, health

centre infrastructure, unsuitable appointment times, or reduced opportunity for GP visits at which to offer cervical screening. Older women and those in rural locations are more likely to experience these processes. Although relationships of cancer risk and screening attendance have not been reviewed, the cumulative evidence on body weight and disability suggests that associations with screening attendance are influenced by stigmatisation and access issues. Accessibility of cervical screening was affected by cost, appointment times and the availability of smear takers. In addition, reviews of health risk behaviours and the use of health insurance equally indicate an association of cervical screening uptake with a general motivation to be healthy.

Interventions to alleviate these problems are, however, unable to raise screening rates to the target levels in isolation, suggesting that psychological factors are at play also. The reviewed literature suggests that patient – doctor interactions and screening invitations promote uptake, while social support interventions appear less effective. Screening intentions, control beliefs, and perceived benefits also appear to be positively associated with attendance, while perceived barriers are associated with reduced attendance. There appears to be an interesting interaction of cancer fear and risk perception, whereby increased perceived risk promotes screening uptake, but fear of an abnormal result, i.e. having failed to prevent, is associated with avoidance. Although greater knowledge of cervical screening is associated with attendance, educational intervention to increase uptake appear to be ineffective. This evidence suggests greater screening knowledge is a result of attendance rather than a cause.

Information levels were among the most frequently reviewed areas in addition to screening promotion and ethnicity levels. Yet, the most detailed evidence was available for socio-demographic predictors. This is surprising given the substantial societal effort necessary to affect change that will lead to improved screening rates. In contrast, while there was a reasonable number of reviews addressing intra-individual explanations of attendance, given the importance of THBs in influencing screening behaviour this area is lacking the most in detailed reviews.

Limitations. While inter-rater reliability was excellent during the abstract review, the insignificant κ-value for the full-text screening indicated poor inter-rater agreement. The discrepancy between the two results may result from the more detailed assessment during the full-text screening. While the only recorded decision in the abstract review was to include or exclude the studies, in the full-text screening the inclusion decision was the result of a checklist assessment of the inclusion criteria. This meant more decisions

needed to be made and could be disagreed on. Whatsoever Higgins and Green (2008), explain that although measures of inter-rater reliability can reveal important discrepancies, due to arbitrarily set cut-off points, κ-values are difficult to compare and the true impact of disagreements on a systematic review is in the nature of the disagreements, rather than their quantity. This nature is best established in discussion, which occurred in this review.

In addition, the reference lists of systematic reviews often show some overlap (Jepson, Harris, Platt, & Tannahill, 2010), meaning greater numbers of reviews drawing the same conclusion should be interpreted, not as a greater amount of primary evidence, but—at its most conservative level—as a clearer body of evidence about which different reviewers can easily agree.

Open questions. The primary limitation of a review of reviews is that it is limited to assessing predictors on which previous systematic reviews have focused (Jepson et al., 2010). Similar to Ellis and colleagues (2003, 2005) the database searches identified a vast amount of cross-sectional evidence that has not featured in review studies, and consequently this information was lost. Jepson and collaborators argue that an examination of this primary research was outside the scope of a review of reviews. Nevetheless, they see an advantage in this issue: reviews of reviews can provide an overview of the evidence and point to areas in which evidence synthesis is most urgent (Jepson et al., 2010). The present review finds that increased systematic reviewing activity is needed in the areas of behavioural risk factors of cervical cancer (e.g. Coughlin, Thompson, Hall, Logan, & Uhler, 2002; Coughlin & Uhler, 2002; Datta et al., 2006; Eaker, Adami, & Sparén, 2001; Sabates & Feinstein, 2006; Sheinfeld Gorin & Heck, 2005) and psychological theories (e.g. Hill & Gick, 2011; Kahn, Goodman, Huang, Slap, & Emans, 2003; Menon, Szalacha, & Prabhughate, 2012; Murray & McMillan, 1993) in relation to cervical screening uptake.

Chapter 4

Theories of health behaviour and behaviour change: A discussion

The previous chapter identified three theories that have been used extensively to explain cervical screening attendance: seven systematic reviews have examined the abilities of HBM and the Theory of Reasoned Action (TRA)/TPB to explain cervical screening behaviour, and Albada and colleagues (2009) report on the only review to examine the use of TTM. Other models that have been applied to cervical screening include the Protection Motivation Theory (PMT), the Social Cognitive Theory (SCT), and the Health Action Process Approach (HAPA). These models are grouped together as expectancy-value theories (EVTs) or social cognition models that have emerged from concepts in social psychology applied to health (Conner & Norman, 2005; Morrison & Bennett, 2006; Ogden, 2007). Most of this evidence, however, has not been examined cumulatively and it has been impossible to establish which theory has been most useful. In an effort to identify the most useful theoretical approach in an Irish context, this chapter will outline expectancy-value approaches to explaining cervical screening uptake and compare their application to Pap test attendance.

Furthermore, researchers have lamented the lack of unity in health behaviour theory for the last twenty years and requested conceptual work that will lead to consistent and unique definitions of EVT concepts (Smedslund, 2000; Weinstein, 1993). Smedslund demonstrates the overlap of differently named concepts across theories that have similar definitions and the problems this poses to theoretical comparison and classification. He explains that the tradition in psychology of inductively building theories that appear to have face value has led to the proliferation of very similar behavioural theories (Conner & Norman, 2005; Smedslund, 2000). The apparent variety of theories that might be used to explain Pap test uptake necessitates a discussion of their similarities and differences. This issue has been scrutinised in the recent literature (Ajzen, 2014; Armitage, 2015; Conner, 2015; Hagger, 2015; Head & Noar, 2014; Ogden, 2015; Sniehotta, Presseau, & Araújo-Soares, 2014, 2015).

Expectancy-value theories

EVTs derive from Expected Utility Theory (Edwards, 1954), an influential economic theory of behaviour which assumes people are rational actors who make logically consistent choices that aim to maximise their personal material, or psychological, gains (Kahneman, 2011). In the early 20th century social psychologists adapted the idea of goal-directed behaviour (Ajzen, 1985) into theories sharing the assumption that actions result from weighing the advantages and disadvantages of the behaviour—estimating its utility. Therefore, these models are based on rational information processing and explain behaviour as due to cognitive factors rather than social context, which impacts behaviour indirectly by influencing cognitions (Brewer & Rimer, 2008; Morrison & Bennett, 2006; Ogden, 2007; Wardle, Robb, Vernon, & Waller, 2015). The models disagree, however, on how behaviour change occurs.

Within this group theorists have conceptualised behaviour change in two ways resulting in two types of EVTs: continuum- and stage-models. Continuum-models propose that behaviour change occurs gradually and as intentions to change increase, so does the likelihood that behaviour will change. Stage-models, however, define different phases of change depending on the level of people's motivation to change and their current behaviour (Conner & Norman, 2005; Morrison & Bennett, 2006; Ogden, 2007). Both types of models have been applied to Pap test uptake.

Continuum-models. Most of the research applying EVTs to Pap test uptake has used continuum-models—primarily HBM and TRA/TPB (Bish, Sutton, & Golombok, 2000; Hennig & Knowles, 1990; Jalilian & Emdadi, 2011; Jennings-Dozier, 1999; Leung & Leung, 2010; Sandberg & Conner, 2009; Walsh, 2005; Walsh, O'Reilly, & Tracey, 2003), but Orbell and Sheeran (1998) and Seydel, Taal, and Wiegman (1990) also investigated the application of PMT, while Peterson, Suzuki, Walsh, Buckley, and Krahn (2012) used SCT.

HBM considers behaviour to occur phenomenologically, that is, in reaction to the person's perception of their environment (Hennig & Knowels, 1990). This environment consists of perceived severity, perceived susceptibility, the anticipated positive and negative consequences, i.e. perceived benefits and barriers, of any action that might reduce severity and susceptibility. Figure 4.1 (see Appendix B, p. B – 2) shows that high perceived susceptibility to and severity of illness create readiness to action, while benefits and barriers balance decisions in favour of a particular course of action intended to reduce susceptibility or severity (Rosenstock, 1966). In Rosenstock's

description of HBM cues to action will trigger the actual behaviour. Such cues can be internal, such as physical discomfort, or external, e.g. from the media or social interactions. In order to perform an action, a cue needs to have personal salience and sufficient strength, which varies according to the level of readiness to act.

PMT can be considered as an extension of HBM (Ogden, 2007; Rutter & Quine, 2002) that accounts for self-efficacy and explains why people might choose alternative, maladaptive behaviours. Like HBM, PMT assumes that fear motivates people to act to reduce perceived severity and susceptibility (see figure 4.2 in Appendix B, p. B – 3). Threat appraisal is a process during which perceived severity and susceptibility are weighed against internal and external rewards of maladaptive behaviour. The latter includes avoidance or denial which can successfully reduce fear, but fail to eliminate the health threat. In contrast, adaptive behaviours are considered during coping appraisal when the costs of healthier alternative actions are balanced against the actions' ability to reduce the threat and the person's perceived ability to perform this action; i.e. self-efficacy. PMT also introduces protection motivation as a measure of intention (Conner & Norman, 2005). Protection motivation results from fear and is influenced by coping and threat appraisal. Norman, Boer and Seydel (2005) describe the role of protection motivation as initiating, maintaining and directing behaviour. Due to its emphasis on severity, susceptibility and self-efficacy, Conner and Norman see PMT as a hybrid of HBM and SCT.

Based on social learning theory (Bandura, 1977 as cited in McAlister, Perry, & Parcel, 2008), SCT combines the principles of learning in a social context with concepts from cognitive psychology. SCT understands people as acting based on deliberate decision-making to maximise benefits and minimise costs. Bandura uses outcome expectancies to explain this deliberative process (Luszczynska & Schwarzer, 2005; McAlister et al., 2008). As shown in figure 4.3 (Appendix B, p. B – 4), outcome expectancies describe the likelihood that various results of an action will occur and the value attached to each result (McAlister et al., 2008). SCT distinguishes three types of expectancies: those of action- and situational outcomes, and self-efficacy. Action-outcome expectancies relate to beliefs about the consequences of changed behaviour, whereas situational outcome expectancies describe results anticipated if no behaviour change occurs (Conner & Norman, 2005). Both types relate to different domains of consequences, such as physical changes to the body after adopting a new behaviour, social responses to the changed behaviour, and self-evaluative outcomes, like anticipated shame or

embarrassment, but also pride caused by having met a personal standard (Luszczynska & Schwarzer, 2005). Self-efficacy is the main concept of SCT and the theory's major contribution to understanding behaviour change. Situational and action-outcomes influence goal formation. Thereby the balance of positive and negative outcome expectancies creates proximal goals, or intentions, to perform or avoid an action. Intention is insufficient, however, to initiate a behaviour and self-efficacy is crucial to achieving this (Luszczynska & Schwarzer, 2005; McAlister et al., 2008). Akin to PMT, self-efficacy describes beliefs about whether an action is within one's control.

SCT is the only theory reported here that links intervention methods directly with its concepts and can thus instruct on how to bring about behaviour change. Thereby SCT focuses solely on self-efficacy. It draws on social learning theory to describe ways of increasing self-efficacy (Luszczynska & Schwarzer, 2005): mastery experiences let people attribute their success in practice runs to their own ability and provide evidence that their feat is repeatable. Alternatively, vicarious experiences of relatable others' successful performance model the desired behaviour. Luszczynska and Schwarzer explain that modelling is a short-cut to experiential learning from previous mistakes. While these two strategies appear to influence self-efficacy most strongly, verbal persuasion to change behaviour, according to SCT, can increase self-efficacy by reassuring people of their skills (McAlister et al., 2008; Luszczynska & Schwarzer, 2005). Given the resource intensity of mastery interventions, observational learning has become the most important intervention strategy based on SCT (Luszczynska & Schwarzer, 2005). Given SCT's detailed description of self-efficacy and ways to increase it to change behaviour, it is not surprising that self-efficacy is one of the most used constructs in behaviour change (Luszczynska & Schwarzer, 2005).

SCT shares its focus on outcome expectancies with TRA/TPB. These theories arose from an attempt to explain why attitudes failed to predict behaviours reliably (Montaño & Kasprzyk, 2008; Morrison & Bennett, 2006). Initially TRA proposed that attitudes combined with subjective norms would create intentions to perform or avoid a behaviour. TPB includes the additional concept of PBC to explain behaviours not entirely under volitional control. Although one would assume that attending for a Pap test is very much under a woman's volitional control, "even mundane everyday behaviors can be subject to unforeseen obstacles" (Ajzen, 2002, pp. 666-667). Thus, TPB is now used more frequently to assess cervical screening uptake than TRA (Bish et al., 2000; Jalilian & Emdadi, 2011; Jennings-Dozier, 1999; Leung & Leung, 2010;

Sandberg & Conner, 2009; Walsh, 2005; Walsh et al., 2003). Figure 4.4 (Appendix B, p. B – 5) demonstrates the relationship of intention with attitude, subjective norm and PBC. TRA/TPB assumes intention to be the most important predictor of behaviour. Ajzen (1991) defines intention as the amount of effort a person plans to exert, or as how hard a person is willing to try. The strength of intention depends on attitude, subjective norm and PBC.

In accordance with Expected Utility Theory, attitudes are defined as depending on personal beliefs about the likelihood that an action will lead to a particular outcome (Bish et al., 2000; Montaño & Kasprzyk, 2008; Rutter & Quine, 2002). This is called outcome expectancies and presents a more restricted version of the term used in SCT. But attitudes also depend on the value a person places on that particular outcome—outcome evaluations (Montaño & Kasprzyk, 2008; Morrison & Bennett, 2006; Ogden, 2007; Rutter & Quine, 2002). According to Ajzen (1991) the expectancy value model of attitude is well-supported by the research on persuasive communication. Ajzen (1991) assumes the same structure applies to subjective norm and PBC, though he fails to provide justifications. Subjective norms depend on normative beliefs and motivations to comply. Normative beliefs are perceived expectations of important others of how the respondent should behave. They are combined with the respondent's degree of motivation to comply with these expectations (Weinstein, 1993). PBC is a similarly binary concept consisting of beliefs about the existence of facilitators or barriers to engaging in a behaviour and the power attributed to each of these enabling or inhibiting forces. According to Ajzen and Fishbein (2004), it is possible that only one or two of the predictor variables may affect intention or behaviour, but Montaño and Kasprzyk (2008) insist that interventions give attention to all model components, because changes in one of the predictors might fail to induce change in intention or behaviour when another component is still inhibiting change.

The theories discussed so far consider behaviour change to be a continuous process that is more likely to occur the stronger the change is motivated. Continuum-models measure the strength of possible influences of behaviours rather than their presence or absences and thus assume these influences can cause behaviour at any point, but are most likely to do so when they are strongest (Sutton, 2005). People might not necessarily have an attitude or an intention towards an action, however; one may not be aware of a health risk from current behaviour or may not have given it sufficient thought yet to form an attitude (Sutton, 2005). Stage models acknowledge this position.

Stage-models. Akin to continuum-models, stage-models propose that behaviour is deliberate (Morrison & Bennett, 2006); but these models distinguish a number of stages through which people are required to progress before behaviour occurs. The processes that let people progress through the stages may differ for each stage or the extent of their influence differs. Crucially, while continuum-models suggest universally applicable interventions, stage-models suggest qualitatively different interventions for people in different stages (Sutton, 2005). These tailored interventions were first proposed by TTM (Prochaska, 2006b).

Stage models have been used in the cervical screening context much less frequently than continuum models. Two theories have been investigated: TTM and HAPA (Arredondo, Pollak, & Costanzo, 2008; Eiser & Cole, 2002; Kelaher et al., 1999; Kwak, Choi, Spring, Park, & Park, 2009; Lee, Lee, Jung, Shin, & Oh, 2005; Rakowski et al., 1997; Strong & Liang, 2009; Tung, 2010; Tung, Lu, & Cook, 2010a, 2010b; Tung, Nguyen, & Tran, 2008).

TTM (Prochaska & DiClemente, 1983, as cited in Prochaska, Redding & Evers, 2008; 1982, as cited in Ogden, 2007) emerged from attempts to unify psychotherapeutic approaches to behaviour change. The model describes five (Conner & Norman, 2005; Ogden, 2007; Rutter & Quine, 2002) or six (Prochaska et al., 2008; Morrison & Bennett, 2006) stages of behaviour change, stratified by people's level of intention and behaviour (see figure 4.5 in Appendix B, p. B – 6). In TTM's first stage, pre-contemplation, people are not thinking about changing their behaviour. They report lower self-efficacy beliefs, more barriers to change and are often in denial of the issue (Morrison & Bennett, 2006), followed by a contemplation stage in which people think about change in the near future (Prochaska et al., 2008). According to TTM people in this stage seek information, report fewer barriers and increased benefits of change—their decisional balance favours behaviour change. They also feel more susceptible (Sutton, 2005). In the preparation stage people intent to change and plan specific changes. According to TTM, goal setting and implementation intentions are evident, but self-efficacy can be over- or underestimated. People who initiate a new behaviour belong in the action stage. The benefits of social support of change and realistic goal setting in the preparation stage become apparent here, while the maintenance stage concerns the continuation of the new behaviour. Maintenance requires reinforcement and self-regulation before the new behaviour has turned into a habit (Prochaska et al., 2008). TTM also describes a termination stage in which the new behaviour has become habit. People report little

temptation to relapse and high self-efficacy to maintain the behaviour. Not everyone progresses to its last stage; TTM acknowledges relapse, which is the return to a previous stage, at any point in the process (Sutton, 2005).

Figure 4.5 (Appendix B, p. B – 6) shows that TTM proposes particular processes that let people progress through the stages. There appears to be a systematic difference between progression among early and later stages. Initially people benefit from affective, evaluative and cognitive processes. These processes include acquiring new facts and ideas in support of behaviour change, experiencing fear and anxiety from their new awareness of being at risk; people also need to make behaviour change part of their identity and to form a decisional balance that favours change. Later progression requires behavioural processes which include social support, self-efficacy, cues to action, and planning to acquire skills and resources, and prepare rewards. TTM suggests that social influences are more important in the later stages, perhaps because people are now required to commit to the change and this commitment becomes public as soon as they initiate the new behaviour (Sutton, 2005; Prochaska et al., 2008; Spencer, Pagell & Adams, 2005).

TTM's stage definitions include specific time frames within which action is expected. Contemplation, for example, requires people to intend to act within the next 6 months (Prochaska et al., 2008). In the case of health behaviours that necessitate an appointment, like cervical screening, such specific time frames might be inappropriate. Prochaska (2006b) counters, however, that tailored interventions necessitate cut-off points, which other theories define just as arbitrarily (Conner & Norman, 2005; West, 2005).

The second stage-model, HAPA, looks very different from TTM, but when their variables, relationships and application in interventions are considered (e.g. Luszczynska, Goc, Scholz, Kowalskas, & Knoll, 2011), like continuum-models, these models are very similar. This surprises little when one considers that HAPA originated from a critical comparison of EVTs (Ogden, 2007; Schwarzer, 1992). HAPA proposes two phases: the motivational and the volitional phase. The motivational phase is concerned with forming intentions to change, while the volitional phase addresses planning to change and action, including maintenance of change and relapse (Luszczynska et al., 2011; Schwarzer, 2008a). Figure 4.6 (Appendix B, p. B – 7) shows that intention develops from outcome expectancies and perceptions about risk, barriers, resources and self-efficacy. Thus, interventions that focus on non-intenders should

teach about risk, benefits of the new behaviour and undesirable consequences of the current behaviour, while intenders have already learned these lessons and instead require lessons about planning for change and planning to cope with barriers (Schwarzer, 2008a). Actors, in turn, have already initiated change rendering planning lessons irrelevant to them. They can benefit from interventions preventing or helping to overcome relapse (Schwarzer, 2008a). Thus, HAPA accounts for relapse in more detail than TTM; where that model relied on merely repeating the required transitional processes to recover from relapse, HAPA accounts for specific recovery processes (Schwarzer, 2011). According to Schwarzer (2008a) HAPA is concise and more parsimonious than TTM. Sutton (2005) argues, however, that HAPA lacks an early stage prior to risk awareness. HAPA further fails to account for termination of change when the new behaviour has become habit and suggests instead that people must consciously maintain the new behaviour indefinitely. Leventhal and Mora (2008) also criticise the lack of experience-based expectancies. They explain that any action is expected to result in a physical experience, critical for self-regulation. Care seeking is frequently initiated after symptoms or critical illness experiences (Leventhal & Mora, 2008). Some women, for example, explain their failure to obtain a Pap test with lacking symptoms (Abdullah, Aziz, & Su, 2011; Grillo, Vallee, & Chauvin, 2012; Hatcher, Studts, Dignan, Turner, & Schoenberg, 2011; Martin-Lopez et al., 2010; Rosvold, Hjartåker, Bjertness, & Lund, 2001). HAPA fails to consider expectancies in its volitional phase, however, and disregards somatic experiences as motivators during intention formation (Leventhal & Mora, 2008).

Comparison to continuum-models. Ogden (2007) and West (2005) point out that, like continuum-models, TTM focuses on decision-making, but it builds on their concepts by integrating the predictors that continuum-models have identified in a more inclusive approach (Prochaska, 2006a, 2006b; Spencer et al., 2005; Spencer, Pagell, Hallion, & Adams, 2002; West, 2005). Stage-models include these predictors, e.g. decisional balance, as targets for these processes, e.g. education about health benefits of the new behaviour.

Moreover, continuum-models do not recognise the sequential nature of the behaviour change process (Leventhal & Mora, 2008). They consider all pre-action stages as one phase and cannot consider a situation without awareness. In contrast, stage-models describe the processes that make unmotivated people ready for change, and then describe the qualitatively different, behavioural processes that are required to translate

that readiness into an action. Stage models can thus account for entire populations to whom a health behaviour is relevant (Prochaska, 2006b). West (2005) argues, however, that stage-models expose people in the pre-intentional stages to interventions supposed to move them to the next pre-action stage. He doubts the practical benefit of such efforts which add to the body of research that has changed attitudes or intention, but not behaviour. Prochaska (2006b) agrees, but explains that TTM interventions expect people to progress until they reach the action stage. Yet, from West's (2005) perspective, TTM prevents pre-intentional participants from receiving high-intensity interventions, even though research supports their effectiveness with people still uncommitted to change. Furthermore, stage-matched interventions which have changed behaviour successfully (see Spencer et al., 2002, 2005) might have had an effect due to the increased amount of attention paid to each participant (Ogden, 2007).

Schwarzer (2008b) argues that the nature of behaviour change is matter of choice rather than truth. He suggests a critical case-by-case assessment whether the assumption of stages is useful and in what context stage-matched interventions prove superior to universal interventions. The choice should therefore depend on what is pragmatic (Schwarzer, 2008b). Prochaska (2006b) adds that continuum- and stage-models serve different purposes and relying on a combination of both will provide the most detailed understanding of behaviour change.

Schwarzer (2008a; 2008b) understands HAPA as a hybrid that considers change to be a continuous process, but uses its motivational and volitional phases to address the intention behaviour gap. Universal interventions based on HAPA would suggest that once strong intentions are achieved, their translation into action is mediated by high self-efficacy and successful planning behaviours, but HAPA can also stage people as non-intenders, intenders, and actors, and suggest tailored interventions (Schwarzer, 2008a; 2008b). Sutton (2005) questions, however, whether research has used HAPA as a stage theory. To be a true stage theory HAPA would have to provide staging algorithms and specify the processes that move people to the next stage. Schwarzer (2008a) points out though that HAPA describes different tasks to change behaviour successfully. These tasks provide different objects[4] for people's self-efficacy beliefs, which are phase- or stage-specific.

[4] I use the phrase *self-efficacy object* following the common use of the term *attitude object*.

HAPA shares this concept with SCT. Both theories distinguish cognitive processes required to form an intention from processes precipitating behavioural performance (Luszczynska & Schwarzer, 2005) and SCT could therefore define stages similar to HAPA's. HAPA has also been considered as an alternative to or improved version of TPB (Leventhal & Mora, 2008; Sutton, 2005) and Sutton (2008) cautions that referring to HAPA as a hybrid would make other EVTs hybrid models, too, and risk losing the distinction between stage and continuum-models (Sutton, 2008).

Value of tailored interventions. Since stage- and continuum-models appear to be complementary and equally useful in understanding and encouraging behaviour change, the most pragmatic choice might well depend on their efficiency. Assigning people to a stage is an arduous process (Sutton, 2005) that must account for intentions, current behaviour, previous change attempts, and time since the new behaviour was initiated (Ogden, 2007; West, 2005). According to Ogden (2007) this additional effort must be justified by more desirable intervention outcomes. Schwarzer (2008a) argues that despite the criticisms of TTM, evidence from tailored interventions suggests that behaviour change can be conceptualised in staged outcomes. Yet, several problems with staging have been raised.

Sutton (2005) reports that research frequently needs to collapse stages when group sizes are insufficient for each stage. In addition, research has found that people seem to skip stages in their transition or they move through them very quickly (Prochaska et al., 2008) which might make the stages unimportant. It is not clear whether these problems arise from change occurring on a continuum or from incorrect measurement of the stages: stage-tailored interventions require participants to remain in one stage between assessment and intervention implementation. To do so participants need to make stable and explicit plans (Ogden, 2007; Schwarzer, 2008b; West, 2005). This is rarely the case, but compliant participants will attempt to accommodate their cognitions within the restraints set by questionnaire response options (West, 2005). Thanks to people's changeable cognitions, stage transitions can occur unexpectedly and formerly tailored intervention would be less or in-effective. If such shifts occur with any regularity, however, they are likely to have influenced previous research to underestimate the true utility of stage-models. (Schwarzer, 2008b)

While the differentiation of TTM stages appears to be supported for smoking cessation, it is less clear how stages of change should be defined in the context of cervical screening attendance (Spencer et al., 2005). Eiser and Cole (2002) as well as

Tung and colleagues (Tung, 2010; Tung et al., 2010a, 2010b; Tung et al., 2008) staged participants depending on whether they planned to have a Pap test within the next 6 months, whereas others have looked at plans for the next 2 years (Arredondo et al., 2008; Eiser & Cole, 2002; Kelaher et al., 1999; Kwak et al., 2009; Strong & Liang, 2009). It is unclear, however, why intentions to have a Pap test within 3 years, rather than 2, would place a woman in contemplation rather than preparation. Action and maintenance lend themselves to definitions according to initial and repeated Pap tests, in accordance with local screening guidelines (Rakowski et al., 1997). Definitions for the earlier stages might rely on decisional balance and the existence of screening intention to distinguish contemplation and pre-contemplation, while preparation might be defined by the existence of concrete plans or implementation intentions.

Moreover, where TTM is uniquely able to make predictions, these are frequently found to be incorrect or less powerful than predictions based on other EVTs (West, 2005). This is not the case, however, when the assigned change processes are used as predictors of the respective transitions (Prochaska, 2006b). According to Spencer and collaborators (2002; 2005) high-quality tailored interventions have provided support for stage theories and TTM needs evaluation in a wider context with more consistent operationalisation and measurement.

Practical issues with expectancy-value theories

The equal distribution of theoretical short-comings across all the EVTs necessitates a look at their general performance and in application to cervical screening uptake.

Application to Pap test attendance. Developed specifically to explain preventive behaviours like cervical screening (Becker, Drachman, & Kirscht, 1974), HBM could be the most widely used theory explaining health behaviours (Bish et al., 2000; Conner & Norman, 2005). Of the six studies that applied the four continuum-models to cervical screening, five compared HBM to another theory. Hennig and Knowles (1990) found HBM to be superior to TRA in explaining intentions to obtain a Pap test, but in other comparisons HBM performed worse (Bish et al., 2000; Seydel et al., 1990).

Bish and colleagues (2000) argue that TPB which can explain a wide range of behaviours was a more economic approach than using HBM which is specific to health behaviours. They found that TPB could explain 51% of the variance in screening intentions, while the predictive model based on HBM was non-significant and explained only 4%. In contrast, Hennig and Knowles (1990) not only found both models to predict intention, but HBM could explain more than twice the amount of variance

explained by TPB. To explain this disagreement, Bish and co-authors point out that Hennig and Knowles investigated TRA, whereas TPB in their study also included PBC which, however, failed to predict intention. Their only predictor of intention was attitude (Bish et al., 2000), whereas Hennig and Knowles found subjective norm to predict intention. These findings agree with Ajzen's (2004) proposal that TPB constructs can be predictive of intention in isolation; however, neither model predicted prospective screening attendance which suggests that the TPB constructs might be unable to explain behaviour independently.

Hennig and Knowles (1990) focused solely on intention. Based on Hill, Gardner, and Rassaby's (1985) conceptualisation of HBM, they expected intention to be influenced by susceptibility, severity, barriers, benefits, and general health motivation (see figure 4.1, Appendix B, p. B – 2), which is a pre-disposition to maintain one's health and prevent illness. In a regression model general health motivation, barriers and susceptibility were significant predictors of screening intentions. Being reminded by her doctor, knowing someone with cervical cancer and being reminded by an important other were the most powerful cues to action. Bish et al.'s (2000) concept of HBM includes susceptibility, severity, barriers, benefits and intention as a mediator between the four original components and behaviour (cf. fig. 4.1). Although susceptibility, barriers and benefits correlated with intention, susceptibility was the only significant predictor of intention in multivariate analysis and overall the model failed to explain a significant amount of the variance. Like TPB none of the five variables was predictive of attendance in multivariate analysis, even if intention was included in the model.

Similar to Bish and co-workers (2000), Seydel and colleagues (1990) conclude that PMT predicted cervical screening intention and self-reported attendance better than HBM. Seydel and colleagues' conceptualisation of HBM is peculiar, however: they assessed severity and susceptibility, akin to PMT, and outcome expectancy, the operationalisation of which suggests that Seydel and co-investigators equate outcome expectancy to perceived benefits and response efficacy. The barriers concept is absent from their reported measures. Nevertheless, their research focuses on the similarities of HBM and PMT; and Seydel et al. report that self-efficacy was necessary in addition to outcome expectancy to predict intention, and also in addition to severity and susceptibility to predict past behaviour. Moreover, perceived severity correlated negatively with past behaviour, which Seydel and collaborators explain as a sign of defensive avoidant coping in women with high perceived threat. Overall, the predictive

utility of self-efficacy was sufficiently superior to severity and susceptibility to make PMT the more predictive model.

In contrast, findings from a purely PMT-based survey lead Orbell and Sheeran (1998) to conclude that both appraisal processes (threat and coping) affect protection motivation. They agree with Seydel and co-workers (1990), however, the PMT is a useful model to predict protection motivation, or willingness to have a Pap test. Orbell and Sheeran found that willingness was predicted by greater perceived risk, less apprehension toward the Pap test procedure, expecting more peace of mind from the test, higher self-efficacy and less avoidant coping. Thirty-eight percent of the sample reported to be willing to have a Pap test. At follow-up, 24% of the sample, and 43% of those willing to have a Pap test, had been screened. Having obtained a Pap test at follow-up was predicted by greater worry about cervical cancer, less negative affect, greater expectation that abnormalities, or other health problems, would be found, and that these abnormalities would be curable. When protection motivation was entered into the model, however, negative affect and expectations of abnormalities or other health problems ceased to predict attendance. Instead protection motivation, worry, expected curability of abnormalities, higher objective and perceived risk predicted attendance. Orbell and Sheeran explain the deviations in this model as a suppressor effect of protection motivation on objective and perceived risk, and independent effects of worry and curability which are not mediated by protection motivation.

Of those unwilling to have a Pap test, however, 12% had obtained a Pap test suggesting that protection motivation is insufficient, if not unnecessary, to initiate behaviour (Orbell & Sheeran, 1998). Although discriminant function analysis explained 90% of the variability between groups of participants stratified by willingness and screening status, the analysis failed to distinguish willing women who were screened or unscreened at follow-up. In this study PMT appeared unable to explain how protection motivation was translated into behaviour. Contrary to proposals by SCT, but in accordance with PMT, self-efficacy was predictive of protection motivation, but not Pap test uptake.

The most recent, and only experimental, study presented here, is Peterson and colleagues' (2012) intervention based on HBM and SCT which successfully increased cervical screening uptake in women without a recent Pap test. Their intervention consisted of a workshop and structured telephone support until follow-up after 6 months. The intervention focused on education about cervical cancer, susceptibility, the

benefits of screening, the Pap test procedure and screening recommendations. The participants practiced overcoming barriers, talking to GPs about screening, setting goals and "initiating change" (Peterson et al., 2012, p. 213). Significantly more women in the intervention group (N = 35) reported having obtained a Pap test at follow-up than in the control group (N = 30). There were no group differences, however, in changes in the mediator measures: self-efficacy, perceived susceptibility, perceived benefits, and intention to obtain a Pap test. The authors argue that their analyses were unable to detect small effects due to the small group sizes. Though not reported in detail, the investigators appear to heed the advice of SCT to stimulate mastery experiences in order to increase self-efficacy. Their inability to demonstrate a significant increase in self-efficacy following the intervention, however, means that they cannot provide support for the mastery – self-efficacy – behaviour relationship.

Among the stage-models, studies of TTM investigated primarily cross-sectional differences in health beliefs, especially perceived benefits and barriers, between stages of Pap test uptake (Eiser & Cole, 2002; Kelaher et al., 1999; Kwak et al., 2009; Lee et al., 2005; Rakowski et al., 1997; Strong & Liang, 2009; Tung, 2010; Tung et al., 2010a, 2010b; Tung et al., 2008). In these studies the TTM stages constituted the outcome variable and in line with research using continuum-models, the findings show that health beliefs favour Pap test attendance most strongly in the later TTM stages, when women report strong intention or previous Pap tests. It is questionable, however, whether these findings add to the understanding that cross-sectional research of the continuum models have provided (West, 2005). While this research is seen as indicating the value of stage-matched interventions (Eiser & Cole, 2002; Kelaher et al., 1999; Kwak et al., 2009; Lee et al., 2005; Strong & Liang, 2009; Tung, 2010; Tung et al., 2010a, 2010b; Tung et al., 2008), Ogden (2007) points out that correlational evidence cannot inform about causal relationships, especially about whether such relationships differ between stage transitions. In line with Spencer and colleagues' (2005) systematic review, Ogden (2007) argues for experimental and longitudinal examinations of stage-matched interventions advocated by cross-sectional research. In relation to cervical screening participation these interventions appear to be scarce (Luszczynska et al., 2011; Spencer et al., 2005). Albada and colleagues (2009) reported two experiments that failed to produce significant effects. While this conclusion makes the utility of stage models in the cervical screening context appear questionable, neither study investigated the transitional processes proposed by TTM and further research is required in that area.

In addition, a decisional balance scale for mammography attendance has been well researched and validated by Rakowski's research team (1997), but further research is required to validate a scale for the context of cervical screening attendance (Spencer et al., 2005). Decisional balance is a core concept of TTM, as it helps to define TTM's stages and provides a measure of readiness to change (Spencer et al., 2005). Rakowski and co-workers have produced a decisional balance scale for cervical screening attendance to combine with their scale for mammography. The individual and combined scales were able to distinguish screened and unscreened women and higher scores predicted progression through the stages. Rakowski and his team, however, defined stages of screening participation exclusively by self-reported attendance in the past and at 1-year follow-up. As their stages fail to reference intention or awareness, they cannot provide evidence of any association between the early TTM stages and their decisional balance scale. Yet, several studies have tested Rakowski and colleagues' scale in varying contexts: it predicted staging in Chinese American women, but not in US Latinas (Arredondo et al., 2008; Strong & Liang, 2009). Kwak and colleagues (2009) assessed the predictive power of the overall pro and con scores separately, rather than using one decisional balance score. They found that among Korean women con scores were negatively associated with the TTM stages, but pro scores were not associated with staging.

Nevertheless, Rakowski and colleagues (1997) acknowledge the scale's low internal consistency and suggest that pro and con items with greater relevance to the studied population could improve consistency. In fact some of the con items—like "After women stop having children they do not need Pap tests." (Rakowski et al., 1997, p. 667)—constitute not so much disadvantages of obtaining a Pap test, as reasons for not doing so. This distinction poses the question whether cons are strictly equal to disadvantages of adopting a behaviour or whether they are synonymous with perceived barriers as described by HBM (Rosenstock, 1966).

Using HAPA, Luszczynska and co-workers (2011) compared the effect of an intervention based on cervical screening benefits to that of usual-care education material on screening intentions. They predicted that the intervention should strengthen non-intenders' intentions (stage-matched), but not those of intenders and actors (stage-mismatched). The researchers found that outcome expectancies mediated the effect of the intervention for participants in all stages, but only for non-intenders aged over 34 years was there a direct effect of benefit information on intention also. Luszczynska and

colleagues understand this evidence as limited support for HAPA; benefit interventions might affect intentions at any point in the change process, as continuum-models have suggested.

This review section demonstrates that despite their many similarities (Weinstein, 1993), research based on EVTs has produced conflicting findings that have generated much debate (Ajzen, 2014; Armitage, 2015; Bish et al., 2000; Conner, 2015; Hagger, 2015; Head & Noar, 2014; Hennig & Knowles, 1990; Ogden, 2015; Seydel et al., 1990; Sniehotta et al., 2015). In the absence of conclusive integration of these overlapping theories (Conner & Norman, 2005) or clear superiority of any one of them, it is worth comparing their relative merits (Weinstein, 1993).

Specification. A possible reason for the lack of consistent findings might be differences in operationalisation of the same theory in different studies. Bish and collaborators (2000), for instance, acknowledge that their and Hennig and Knowles's (1990) conflicting findings might be due to different conceptualisations of HBM and TRA/TPB. Similarly, PMT originally proposed that the effect of fear appeals was influenced by the amount of perceived susceptibility, severity and response efficacy they can generate in their audience (Conner & Norman, 2005). Rogers (1983 as cited in Norman, Boer & Seydel, 2005) later broadened the model to allow for other appraisal stimuli besides fear appeals. Established scales to measure the concepts of expectancy-value theories do not exist and researchers are left to develop their own, often context-specific scales (Smedslund, 2000). Bish and colleagues (2000) adapted their HBM measures from Champion's (1984) frequently used scale and developed their TPB items based on Ajzen's research (Ajzen & Timko, 1986; Fishbein & Ajzen, 1975). Hennig and Knowles (1990) adapted the scales presented by Hill and colleagues (1985).

In this respect the clarity with which TPB relates its concepts to each other and explains their measurement and computation is an important advantage (Montaño & Kasprzyk, 2008; Morrison & Bennett, 2006; Ogden, 2007). Citing Fishbein and Ajzen (1975), Montaño and Kasprzyk (2008) report that attitudes towards the behaviour, e.g. screening, predicted this particular behaviour better than attitudes towards an object related to that behaviour, e.g. cervical cancer. A wealth of TRA/TPB research has shown that a highly predictive behavioural model will have a high degree of correspondence between the measured variables and the behaviour, its context and timing (Montaño & Kasprzyk, 2008). Other EVTs, like HBM, are not usually operationalised to correspond to the measure of behaviour, as is the case with TPB

(Ajzen & Timko, 1986 as cited in Bish et al., 2000) and Bish and co-investigators suggest that the performance of HBM might improve if the principle of correspondence was employed; although they allow that it would be difficult to apply to susceptibility and severity. These concepts are phrased in relation to either illness or current behaviour, while TPB variables are phrased in relation to the desired behaviour (Weinstein, 1993).

Furthermore, measures of behaviour should consider four elements: action, target, context and time (Fishbein & Ajzen, 2010). Action considers the form of the behaviour; compare *preventing cervical cancer* and *attending for a Pap test*. The former may be considered a composite behaviour, often more ambiguous, while the latter is more concrete. *Preventing cervical cancer* could also mean to stop smoking, abstaining from sexual intercourse, etc. The target refers to the object to which the action is directed. The context can describe the physical, but also the mental situation in which the action should occur, while time specifies a particular point in time or a time frame for the action to be performed. Although Fishbein and Ajzen (2010) emphasise that the measures for behaviour and its predictors must be at the same level of specificity, neither requires specification to the highest level. In fact, highly specified intentions, such as I *intend to obtain a Pap test at my GP practice on Friday at 4pm* would be very similar to Gollwitzer's (2006; Gollwitzer & Bargh, 2005) operationalisation of an Implementation Intention. These are concrete plans of how, where and when the new behaviour will occur; they function as pseudo-habits by tying actions to environmental cues and eliminating conscious thought about behaviour initiation (Norman & Conner, 2005).

In contrast to the regimented formulations of intention and behaviour measures, the identification of relevant behavioural, normative and control beliefs is an empirical matter and depends on the wording of questions and the population studied (Sutton et al., 2003). While the evidence for the underlying belief structure of attitudes, subjective norm and PBC is mixed (Ajzen, 1991) and careful, representative sampling to establish beliefs salient at the population-level creates additional effort (Sutton et al., 2003); this population-specificity makes TPB applicable cross-culturally and keeps TPB-based assessments grounded in the data (Montaño & Kasprzyk, 2008). Hennig and Knowles's (1990) disagreement with Bish and colleagues' (2000) findings could have its origins in specification: HBM might have performed comparatively better than TRA because certain items of their TRA scales failed to correlate with intention in their sample of

women aged, on average, 54 years. Hill and colleagues' (1985) did find a correlation using the same items and, like Bish et al., they studied a younger sample.

In addition, TPB specifies how item scores and sub-scales should be combined mathematically, while HBM either fails to do so or the original instructions are typically disregarded (Morrison & Bennett, 2006; Weinstein, 1993). Researchers decide individually how to weight barriers against benefits and how to calculate readiness to action from susceptibility and severity (Brewer & Rimer, 2008; Morrison & Bennett, 2006). HBM is thus a good example of how past research has used a variety of versions of popular EVTs: some of this research included additional variables, such as health motivation, or excluded others, like cues to action (Sheeran and Abrahm, 1996 as cited in Morrison & Bennett, 2006; Weinstein, 1993). Research also frequently fails to use TPB as intended (Weinstein, 1993). Kwak and colleauges' (2009) liberal use of Rakowski et al.'s (1997) decisional balance scale shows that stage-models are not exempt from this criticism. It is therefore unsurprising that the results of different studies are difficult to compare (Schwarzer, 2008a).

Variance explained. The inconsistent use of EVT variables might offend less when seen in light of recent findings that the success of interventions in changing behaviour depends as much on the strategies as on the target population and context (Michie, 2015; Sainsbury, 2015). Although a large-scale US study found HBM to predict only a small amount of the variance in preventive and diagnostic behaviours (Kirscht, Haefner, Kegeles, & Rosenstock, 1966), Rosenstock (1966) argues that this was due to a lack of attention given to cues to action and unequal access to studied services. He also provides evidence for the predictive power of perceived susceptibility and severity. Kirscht and colleagues' findings also stress the importance of benefits in combination with readiness to action, though a review of 46 HBM-based studies concluded that perceived barriers were the strongest predictor of behaviour change (Janz & Becker, 1984). Morrison and Bennett (2006) explain that the predictive power of the HBM components varies depending on the studied behaviour.

Similarly, self-efficacy has received considerable research attention (McAlister et al., 2008). In a meta-analysis of the predictive ability of PMT (Norman et al., 2005) self-efficacy explained a medium to large amount of the variance in protection motivation, while protection motivation explained a small to medium amount of behaviour. The constructs of the other self-efficacy based model, SCT, are among the most researched behavioural predictors; outcome expectancies and self-efficacy can predict between 10

and 36 percent of the variance in behaviour, depending on the behaviour in question (Luszczynska & Schwarzer, 2005).

Although PMT appears to predict a limited amount of variance in intention and behaviour (Norman et al., 2005), Seydel and colleagues (1990) find that PMT still explained more of the variance in intention to have a Pap test than HBM. Rosenstock and colleagues (1988) agree that HBM often predicts less variance than they would expect from a well-researched model. Janz and Becker's (1984) comprehensive systematic review found that the model explained between 10 and 34% of the variance in behaviour, though HBM has been found to be a better predictor of intention than behaviour (Morrison & Bennett, 2006). The same appears to be true for TPB: reviews found TPB to account for 27 to 38% of behavioural variance and 39 to 50% of the variance in intention (Ajzen, 2004; Sutton, 1998). In comparison with other EVTs TPB fared well; and if performance was considered in terms of the balance between the number of predictors and the amount of variance explained TPB did quite well also. Sutton (1998) concludes that, although 100% of the variance explained would be ideal, this standard was unreasonable.

Despite these pessimistic findings, Sutton and co-authors (2003) argue that, at least for intention, random factors might explain most of the variance and limit the amount of variance that EVTs can explain. Furthermore, Smedslund (2000) points out that a test of any theory-derived hypothesis was also a test of the accuracy of the measurements. For example, the theoretical ceiling for the correlations of attitudes, subjective norm and PBC with intention and behaviour was at .6 (Ajzen, 2011). This figure suggests that the theory can explain a maximum of 36 percent of the variance, which is in line with the figures above (Ajzen, 2011). Such moderate correlations could result purely from the influence of measurement error: reliable measures of the TPB variables still only achieved reliability coefficients between .75 and .80 (Ajzen, 2011).

While Sutton (1998) concedes practical utility even to models with small effect sizes in applied settings, the continued re-assessment of EVTs acknowledges new developments in the field and suggests additional variables to improve the predictive power (Brewer & Rimer, 2008). For instance, some authors have questioned whether TPB is sufficient as a theory and whether further predictive variables should be added (Ajzen, 1991, 2011; Ajzen & Sheikh, 2013; Bish et al., 2000; Morrison & Bennett, 2006). Anticipated regret might add substantially to the amount of variance explained (Ajzen & Sheikh, 2013; Walsh et al., 2003). Bish and colleagues, however, fail to demonstrate an

increase in variance accounted for by TPB and anticipated regret of avoiding cervical screening. They explain that avoiding screening *now* does leave the option of attending at a *later* point in time. This might have reduced any influence of anticipated inaction regret. Ajzen and Sheikh (2013) further report that anticipated affect only made a significant contribution to the predictive model when assessed in relation to the behaviour opposing the one measured by TPB. Nevertheless, Ajzen (2011) cautions that theorists must balance sufficiency against parsimony. Extensions to TPB should meet five criteria, which include the new variable's independence of already existing TPB variables (Fishbein & Ajzen, 2010). According to Ajzen (2011) anticipated regret fails to meet this criterion. Ajzen and Sheikh (2013) conclude that anticipated regret constituted an affective behavioural belief and was therefore part of affective attitude. Rather than measuring anticipated regret, they suggest that affective and instrumental attitude should be assessed for the performance of the target behaviour as well as its opposite.

The habit to add or exclude constructs also affects stage models. Sutton (2005) describes a Dutch version of TTM that divides pre-contemplators into those unwilling to change, and those willing to change, but not in the near future. In this model stage definitions were based solely on the respondents' intentions and most of the transitional processes are disregarded in favour of emphasising decisional balance and self-efficacy (Sutton, 2005). Others argue however that since "… the timely and appropriate use of processes is the basis for a stage-matched intervention, careful definition and measurement of the processes is essential." (Spencer et al., 2005, pp. 53).

Similarly, HAPA can be considered "incomplete rather than wrong" (Leventhal & Mora, 2008, p. 52), but different attempts to complete HAPA have merely assigned different labels to the same constructs (Conner & Norman, 2005). Ogden (2007) included action control, a form of self-regulatory monitoring, as a process leading from intention to action. Action control has been shown to benefit people in the volitional stage (Schwarzer, 2008a; 2008b; Sutton, 2005), but Schwarzer's (2008a) call for further research into the role of self-regulatory processes in HAPA explains his then-current omission of action control in his diagram of the model. Schwarzer, Lippke, and Luszczynska (2011) conclude that self-regulatory processes help explain cognitions in behaviour change and they include action control as a process relevant to actors.

This section has shown that EVTs are frequently used to explain or modify behaviours. The utility of EVTs appears to be context depended, however, and in attempts to increase their applicability and explain behaviour better the chosen EVTs

are often modified. Further research is needed to better understand the effect of adding constructs to established EVTs. In order to achieve this standardised operationalisations and measures of EVT constructs are desirable.

Construct-sharing among expectancy-value theories

In addition to lacking standardised definitions of their constructs, EVTs show considerable conceptual overlap. This section compares constructs shared between EVTs.

Perceived threat. Interest in using fear appeals in persuasive messages might have arisen from early review findings suggesting a linear relationship of motivation for adaptive behaviour and level of fear of a health risk (Norman et al., 2005). PMT was initially developed to study the impact of fear appeals and persuasive communication (Conner & Norman, 2005; Orbell & Sheeran, 1998) and to discover whether fear appeals affect attitude and behaviour directly (Norman et al., 2005). Seydel and co-workers' (1990) found, however, that perceived threat is insufficient to predict intention or behaviour.

Furthermore, Janz and Becker's (1984) systematic review of HBM research found perceived severity to be the least predictive component. They explain that perceived severity might be more salient to people already diagnosed with a condition, while perceived susceptibility might be more relevant to people considering preventive behaviours (see also Champion & Skinner, 2008). In contrast to HBM, PMT proposes that moderate levels of fear are more effective than little or great fear (Norman et al., 2005). The relationship between level of fear and adaptive coping forms an inverted U-shape, whereby the lowest and highest levels of fear fail to motivate or increase the likelihood of maladaptive behaviour (Norman et al., 2005; Wardle et al., 2015). Excessive fear can induce denial responses; and perceived susceptibility might have been overemphasised in the past (Morrison & Bennett, 2006). Adaptive problem-solving behaviours are more likely to occur when a persuasive message combines fear communication with constructive behavioural alternatives (Conner & Norman, 2005; Norman et al., 2005). HAPA's division into a volitional and a motivational phase helps to further explain the ambiguous relationship of perceived threat and behaviour change. Schwarzer (2008a) argues that fear messages and risk-based persuasion might motivate behaviour, but they will initiate behaviour effectively only if combined with concrete action plans, such as those described in HAPA's volitional phase. Despite this distal

influence, Conner and Norman consider perceived threat variables to be a useful addition to models that have so far failed to consider it explicitly, because health risk awareness is necessary to make informed decisions about heath behaviours.

Both Hennig and Knowles (1990) and Bish et al. (2000) argue that TRA/TPB lacks questions about affect and perceived threat, but others explain that perceived threat is included in TRA/TPB implicitly. Brewer and Rimer (2008) suggest that perceived threat influenced attitudes and was thus accounted for by TRA/TPB. According to Weinstein (1993) behavioural beliefs in TRA/TPB can consider a wide range of consequences, including the cost of current behaviours which might be increased susceptibility to and severity of an illness. Smedslund (2000) adds that perceived threat might include anticipated social disapproval and the concept was therefore also included as part of subjective norm. Threat conceptualised in this manner enables its measures to correspond to measures of behaviour as advocated by TRA/TPB (Bish et al., 2000). The conclusion to this argument will depend on whether perceived threat can be shown to influence intention or behaviour directly or through attitude and subjective norm.

Environmental influence. EVTs are largely concerned with intra-personal influences of behaviour (Glanz et al., 2008; Morrison & Bennett, 2006; Ogden, 2007; Wardle et al., 2015). Some theories, like TRA/TPB or SCT consider factors outside the person that motivate behaviour—and evidence from organisational interventions to change behaviours suggests that other theories ought to consider social and contextual influences as well (Glanz et al., 2008).

Social influences. EVTs commonly emphasise beliefs over social context (Conner & Norman, 2005; Glanz et al., 2008; Morrison & Bennett, 2006; Ogden, 2007), including the effect of health care provider behaviour on the patient's behaviour (Melstrad, 1966). TRA/TPB is the only EVT that explicitly considers subjective norms (Conner & Norman, 2005). Similarly, Ogden (2007) distinguishes situational outcome expectancies in HAPA from cognitive and behavioural expectancies, though she believes that HAPA still fails to consider the role of social and environmental factors sufficiently. In HBM cues to action can arise from social situations (Conner & Norman, 2005; Rosenstock, 1966). Subjective norms, however, can predict cervical screening attendance (Hennig & Knowles, 1990; see also Chapter 3), which suggests that HBM's failure to account for social influences explicitly limits the amount of variance in health behaviour explained by the model (Morrison & Bennett, 2006).

Furthermore, SCT includes social outcome expectancies (Conner & Norman, 2005) thus combining two of the most frequently used constructs in behaviour change (Luszczynska & Schwarzer, 2005). In terms of resources, self-efficacy appears to be the most powerful independent factor in predicting behaviour change, followed by social norms and peer pressure. Luszczynska and Schwarzer point out that social influence and self-efficacy might measure the same concept when people conflate their perceived ability to resist social pressure and rouse social support with their true ability to do so. Such all-inclusive concepts inhibit our ability to assess whether and how much of an individual explanation of behavioural change social influences can be (Conner & Norman, 2005).

Contextual influences. According to Ajzen (1991) TRA/TPB can account for context-specific behaviour. Personality traits, environmental and demographic variables are proposed to affect people's behaviour indirectly via attitudes, subjective norms and PBC (Montaño & Kasprzyk, 2008). This relationship explains the importance of elicitation studies: indirect measures of attitudes, subjective norm, and PBC indicate which beliefs are relevant to initiating the assessed behaviour (Ajzen, 1991, 2011; Montaño & Kasprzyk, 2008). This also means that TRA/TPB does not require any explicit assessment of personality and context variables, making Ajzen's (1991) proposition difficult to test.

It is SCT, however, that has emphasised contextual influences in behaviour change the most. SCT acknowledges that the success of modelling and observational learning, and thus behaviour change, requires supportive environments (McAlister et al., 2008). For instance, McAlister and colleagues explain that incentives and disincentives can be seen as environmental behaviour change techniques. Public policies can impact behaviour change and maintenance of change using these strategies; however, rewards and punishments provide external motivation and incentives are often seen as unfair by people who already perform the desired behaviour without receiving any incentives. In contrast, facilitation enables behaviour by reducing barriers and thus making the behaviour easier to perform. This strategy depends on internal motivation and is therefore preferable. Another key concept of SCT is self-regulation, which is not dependent on people's resolve, but can be learned as a set of skills, including self-monitoring, goal setting, self-reward and -instruction, and also active seeking of social support. These skills allow people to create their own reward and punishment

contingencies or facilitating environments (McAlister et al., 2008). People can thus take control of their behaviour change environment.

The role of control. Six of the seven models introduced in this chapter include explicit concepts of control. SCT, PMT, TTM and HAPA include self-efficacy, which has also been added to HBM (Rosenstock et al., 1988; see figure 4.1 in Appendix B, p. B – 2), and it was the addition of PBC that turned TRA into TPB (Ajzen, 1991).

People high in self-efficacy will focus on how to overcome obstacles and how to use opportunities, rather than focus on the existence of barriers (Luszczynska & Schwarzer, 2005). Bandura (1997 as cited in Luszczynska & Schwarzer, 2005) distinguishes four types of self-efficacy that are specific to the SCT phases of behaviour change (see figure 4.3 in Appendix B, p. B – 4): pre-action self-efficacy concerns beliefs in one's ability before change has occurred; action self-efficacy is one's perceived capability once a target behaviour is chosen; coping self-efficacy results in anticipating obstacles and ways to deal with relapse, and relapse self-efficacy is influenced by attributional style. In this sense, SCT is quite similar to the stage models (Luszczynska & Schwarzer, 2005). In fact Prochaska and DiClemente (1986) included self-efficacy in their stage model, TTM. Both models propose that in addition to intention, high self-efficacy is required to initiate action; self-efficacy is therefore directly linked to behaviour change. But, according to SCT, self-efficacy also has an indirect influence over behaviour, because people are likely to choose to perform behaviours which they feel capable of performing (Luszczynska & Schwarzer, 2005).

While HBM has been criticised for disregarding self-efficacy beliefs and failing to consider the agent's perceived capability to perform an action (Hennig & Knowles, 1990; Hill et al., 1985; Morrison & Bennett, 2006; Rosenstock et al., 1988), Janz and Becker (1984) suggest perceived barriers contained self-efficacy. Weinstein (1993) agrees that if self-efficacy is understood as assessing people's perceived ability to overcome particular barriers to behaviour change, the idea is already included in HBM within the perceived barriers concept. Nevertheless, Rosenstock and colleagues argue this definition would broaden the barriers concept too much while failing to improve the explanatory or predictive power of the model. Instead self-efficacy should be added to HBM as a separate concept. This addition would narrow the usually broad concept of perceived barriers, which can include any type of internal or external barrier to action (Conner & Norman, 2005; Rosenstock et al., 1988). Conner and Norman (2005) conclude that this definition of perceived barriers is much clearer and adds to the

predictive ability of the model. Although Rosenstock et al. and Weinstein require further research to find out if behaviour is predicted better when self-efficacy and barriers are separated or combined, self-efficacy was commonly added to HBM following Rosenstock and colleagues' argumentation. The inclusion of self-efficacy in HBM nearly turns it into another theory, however: the PMT.

Weinstein (1993) demonstrates that PMT and HBM both measure perceived threat through susceptibility and severity and weigh benefits and costs of possible actions. Threat appraisal can be equated to readiness to action in HBM, and coping appraisal, with its balance of response efficacy and response costs is very similar to HBM's decisional balance. PMT nevertheless benefits from including self-efficacy separately. Perceived barriers and response costs have been seen as "specific control issues" of a health behaviour, and therefore as similar to TPB's PBC (Conner & Norman, 2005, p. 17). They may be distinguished from self-efficacy, however, when self-efficacy is understood as the likelihood of being able to successfully complete the new behaviour (Weinstein, 1993). Instead, this perspective equates self-efficacy with PBC (Weinstein, 1993). Furthermore, Conner and Norman (2005) point out how self-efficacy and PBC are both expected, in SCT and TPB respectively, to influence behaviour independently of intention—which adds to their similarity at a functional level, though Ajzen (2002) disagrees.

Ajzen (2002) examined the relationship between PBC, self-efficacy and LoC. He concludes that PBC is made up of self-efficacy and perceived controllability, the extent to which performance depends on external factors. Further, PBC describes the subjective ease of an action, while LoC is a trait rather than behaviour-specific and describes whether people attribute control over events and outcomes to themselves, others or chance. This description of LoC is rather similar to Luszczynska and Schwarzer's (2005) definition of self-efficacy. To emphasise the distinction between PBC and LoC, however, Ajzen (2002) argues that people with an external LoC can report high PBC over a particular behaviour. This argument suggests that people can be solution-focused for a particular behaviour, despite an external LoC. Overall, it appears that the concepts relating to control over behaviour have not yet been definitively delineated. The continuation of this debate demonstrates the value of control variables in all EVTs (Conner & Norman, 2005).

Integrated change. Perceived threat, subjective norms and control are the most widely shared and most debated EVT variables. Smedslund (2000) reports that

Weinstein (1993) identified 9 unique concepts among HBM, PMT, TRA/TPB and SCT, different numbers of which were included in each theory. Most fundamentally these theories are based on subjective, rather than objective beliefs that are influenced as much by information as by norms and customs of people's social environment (Brewer & Rimer, 2008; Rosenstock, 1966). Smedslund concludes that the considerable similarities between EVTs result from the same process of intuitive and plausibility-based reasoning behind all of them. He points out that these theories appear to agree on a particular set of concepts to explain behaviour.

According to Smedslund (2000) the profound difference is in the beliefs each model perceives as worth explicating. While susceptibility and severity can be considered as part of an attitude, subjective norms can be seen as a perceived benefit—pleasing an important other by performing an action—or as a barrier—when a norm is opposed to performing the behaviour. Similarly PBC could be argued to result from an evaluation of the ease of overcoming barriers (Luszczynska & Schwarzer, 2005; Weinstein, 1993). Furthermore, psychological, social and physical outcome expectancies in SCT combine what TRA/TPB describes as subjective norms and attitudes in one broad concept. This is in line with SCT's idea of people as shaping and being shaped by their actions, society and their physical environment. McAlister and co-authors (2008) caution, however, that SCT's broad scope is ambitious. Yet due to its ambitious scope SCT can be seen as the most integrated EVT discussed so far. Figure 4.7 below summarises the conceptual overlap discussed in this section, based on the structure of SCT.

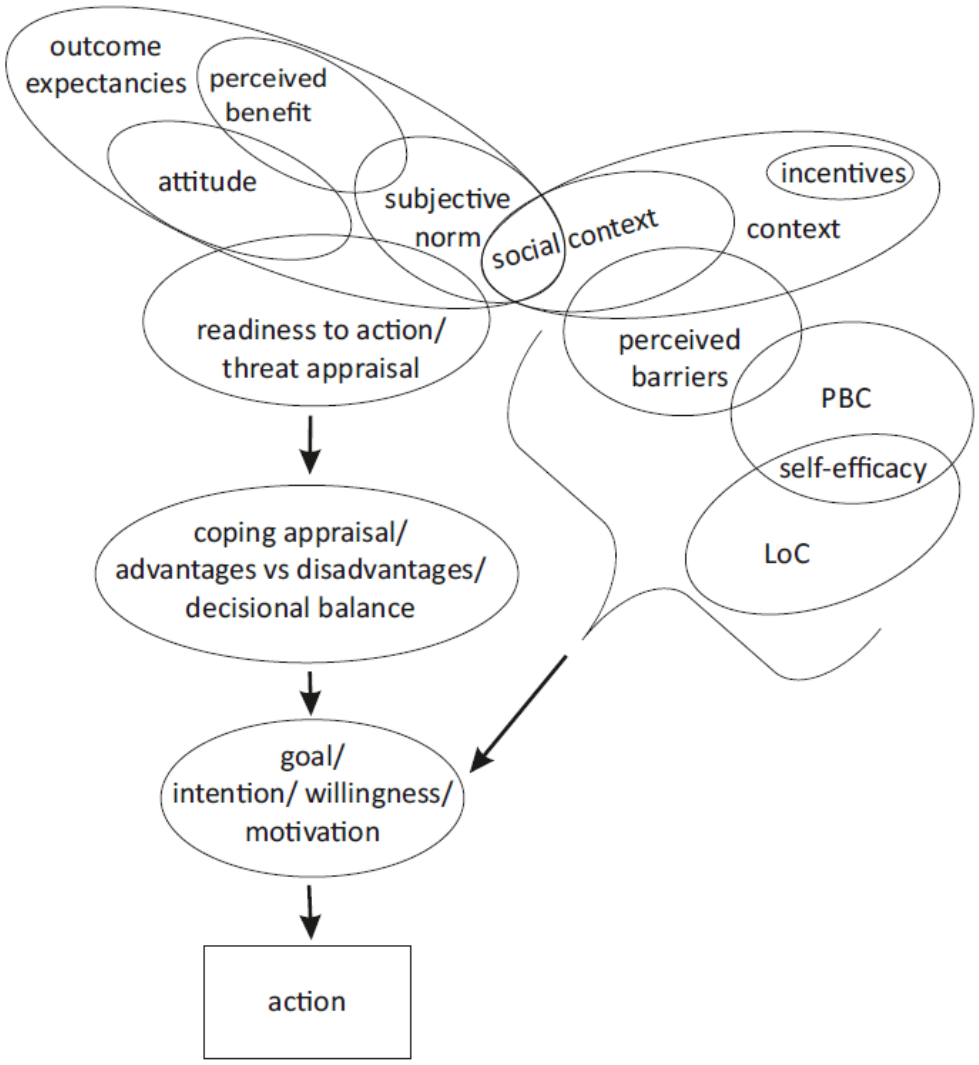

Figure 4.7. Conceptual overlap among key health behaviour constructs

Given the considerable overlap of EVT concepts, Norman and Conner (2005) call for their formal integration. In an expert meeting to unify EVTs, Fishbein and colleagues (2001; Conner & Norman, 2005) arrived at a set of eight predictors of deliberative behaviour. They identified intention, skills to perform the behaviour and the absence of environmental constraints as the necessary and sufficient conditions of behaviour change; and they agreed on five further variables that primarily affect intention: cost-benefit balance, subjective norms, behavioural consistency with self-image, anticipated positive emotions from performance and self-efficacy. Conner and Norman (2005) note that the experts excluded perceived threat constructs, while self-identity is absent from major EVTs and had been found to predict little additional variance. The experts also failed to agree on how the included variables should be combined mathematically when measured as behavioural predictors. Perhaps due to the

lack of information regarding its practical use, this model has not been tested empirically (Conner & Norman, 2005).

Dutch researchers, however, studied cervical screening attendance using the Integrated Model of Behaviour Change (I-Change Model, Knops-Dullens, de Vries, & de Vries, 2007) as shown in figure 4.8 (Appendix B, p. B – 8). The I-Change Model was developed by de Vries and co-authors (2003) and, similar to Fishbein and colleagues' (2001) model posits that behaviour is directly affected by intention and the translation of intention into behaviour depends on abilities and barriers, which could equal Fishbein et al.'s environmental constraints. In the I-Change Model intention has three components: precontemplation, contemplation and preparation—the three motivational stages of TTM (De Vries & Mudde, 1998). According to de Vries and colleagues intention is influenced by attitude, defined as rational and experiential benefits and costs, by social influences, and self-efficacy. These predictors form the group of motivational factors which result from awareness factors—knowledge, cues, and perceived threat—and predisposing factors including behavioural, psychological, biological, socio-cultural and information factors. In contrast to Fishbein and co-authors' model, the I-Change Model does include perceived threat constructs, but fails to explicate self-identity on which Fishbein et al. put more emphasis.

Similar to SCT, this model includes a wide range of influences on intention and behaviour. While this effort to integrate the wealth of salient predictors of behaviour could be seen to have resulted in a model that merely combines all these predictors, the I-Change Model explicates all of the influences that its developers considered relevant and can provide a summary of the main influences on behaviour that behavioural scientists should consider. The model's breadth ensures that potentially salient aspects from the most relevant theories are examined in Knops-Dullens and collaborator's (2007) study of cervical screening.

Attendance was predicted by the use of oral contraceptives, stronger subjective norms, stronger self-efficacy to overcome screening barriers and more positive attitude toward screening. Non-screeners reported more emotional disadvantages to screening, which resulted in their more negative attitude overall (Knops-Dullens et al., 2007); but the predictive ability of attitude disappeared when the researchers added a measure of attitudinal ambivalence to their regression model of screening behaviour. Similarly, intention, which was frequently found to predict behaviour in previous applications of the I-Change Model, failed to explain any additional variance after attitudinal

ambivalence was added (Knops-Dullens et al., 2007). The authors explain this finding as caused by the low levels of accurate knowledge about screening among their sample; however, they also stress the importance of stronger negative affective attitude among unscreened women.

It is evident that further integrative work is needed. Combining SCT constructs with the sequential nature of behaviour change, HAPA might be a model with integrative potential, but the overlap in concepts appears to complicate integration (Conner & Norman, 2005; Leventhal & Mora, 2008). Extensive efforts in this area have recently begun at University College London, however (Michie, 2015).

Intentions and decision-making

This last section examines concerns surrounding the intention – behaviour gap and efforts to bridge it. Stage-models might be better suited to eliminate this problem. To intervention efforts the intention – behaviour gap is a practical challenge; attempts to overcome it have involved Implementation Intentions and planning behaviours. Failure to execute one's intentions could also result from habits created by past behaviour. Actions might therefore occur automatically. In addition, current research suggests that intentions are not only formed consciously, but also intuitively with little awareness. Dual-process models of decision-making offer a new perspective on behaviour and behaviour change.

Does intention help predict behaviour? One of the major contributions of PMT and TRA/TPB is the addition of an intentional concept to models of threat and of the attitude – behaviour relationship (Morrison & Bennett, 2006). There is general agreement that intention, motivation, and willingness refer to the same underlying construct (Montaño & Kasprzyk, 2008; Orbell & Sheeran, 1998; Rutter & Quine, 2002). According to Conner and Norman (2005), intention is a frequently considered an important variable, not only because it is usually predictive of behaviour, but also because it marks the end of a motivational phase, or choice motivation (Orbell & Sheeran, 1998), and beginning of a volitional phase (executive motivation, Orbell & Sheeran, 1998) of behaviour change. Nevertheless, there are concerns surrounding the intention – behaviour relationship.

In a review of TRA/TPB research Sutton (1998) concludes that intention was an unreliable predictor of behaviour. He criticises the possibly reciprocal causality of attitude, intention, and behaviour (Sutton et al., 2003), which creates the uncertainty

around the intention – behaviour relationship. TPB fails to acknowledge this problem (Morrison & Bennett, 2006). While cross-sectional research finds associations of attitude with intention and behaviour in accordance with TPB (Cooke & French, 2008), it is conceivable that the results of past behaviour and current intentions influence attitude at the point of measurement. More experimental research is required to ascertain this causal chain.

Researchers have argued that higher correlations between, for example, TPB predictors and behaviour would be achieved if the variables were measured in closer temporal proximity (Ajzen, 1985, 2011; Ogden, 2007; Sutton, 1998). Similar to the volatility of stage assessments (Schwarzer, 2008b), new information, altered salience of beliefs, commitment to the intention and individual differences might lead to further intention change by the time behaviour was assessed (Ajzen, 1985). There is a lack of research, however, about how much time may lapse before intentions change (Conner, Sheeran, Norman, & Armitage, 2000). Ajzen's (1985) argument that researchers are usually concerned with the average intention of a target group and that these appear to be more stable than individual intentions might explain the gap in the literature. Nevertheless, the stability argument seems all too effective at explaining any low correlation between intention and behaviour.

In addition, continuum-models frequently fail to account for processes that translate screening intentions into attendance (Orbell & Sheeran, 1998; Sutton, 2008). They might be better suited to explaining and predicting the motivational phase and research needs to investigate how volitional processes can translate intentions into behaviour (Conner & Norman, 2005; Orbell & Sheeran, 1998). A good starting point for such research appears to be Gollwitzer's (2006; Gollwitzer & Bargh, 2005) concept of Implementation Intention (Conner & Norman, 2005; Morrison & Bennett, 2006; Ogden, 2007; Orbell & Sheeran, 1998; Rutter & Quine, 2000). In experimental studies women who formed Implementation Intentions to obtain a Pap test were significantly more likely to do so (Sheeran & Orbell, 2000; Walsh, 2005). These findings suggest that planning how to initiate a new behaviour can successfully translate intentions.

Similarly, Schwarzer (2008a) emphasises the need for planning behaviours to move from the motivational to the volitional phase. He describes two planning processes in HAPA (Schwarzer, 2008b): action planning to initiate behaviour and coping planning to prevent relapse. Action planning is similar to Implementation Intentions (Conner & Norman, 2005; Sutton, 2005) in specifying how, where and when an intention will be

realised. Coping planning is the anticipation of obstacles to behaviour change and concrete strategies to overcome them. Sutton (2005) argues, however, that it is unclear whether planning mediates or moderates the relationship of intention and behaviour. While Schwarzer's (2008a; 2011; Schwarzer et al., 2011) diagram would suggest a mediated model, Gollwitzer's (1999 as cited in Sutton, 2005) understanding of Implementation Intentions supports moderation. Sutton (2008) explains that while moderators reduced the intention – behaviour gap, at least mathematically, for one category of the moderator, it increased it for the other category. If the latter included people with strong intentions, who failed to form plans, and did or did not perform the behaviour, the problem was much the same as the weak direct relationship of intention and behaviour.

Past behaviour. Future behaviour is frequently best predicted by past behaviour (Sutton, 1994), but continuum-models in particular have been criticised for their failure to account for past behaviour. Their constructs are predictive of behaviour in people who perform the behaviour in question habitually (Melstrad, 1966; Ogden, 2007; Norman and Conner, 2005). In contrast, stage models acknowledge relapse (Sutton, 2005) and thus can account for past behaviour. Although TTM accounts for habituation through its termination stage (Prochaska et al., 2008; Morrison & Bennett, 2006), West (2005) criticises TTM for failing to consider strategies to break habits carved by past behaviour. Prochaska (2006b) explains, however, that processes of change like reinforcement and conditioning can deal with habit change. Similarly, Ogden (2007) acknowledges that the effects of previous performances of the behaviour are accounted for in TPB through PBC. She sees control beliefs as influenced by past performance, and this idea is not unreasonable, as PBC partially consists of self-efficacy, which is influenced by mastery (Luszczynska & Schwarzer, 2005), i.e. successful past performance. Nevertheless, Norman and Conner (2005) show that the continuum-models, including TRA/TPB, predict future behaviour better when they include a measure of past behaviour.

While Norman and Conner (2005) consider TRA/TPB's failure to account for past behaviour a serious shortcoming, they cite Ajzen (1987) as arguing that, despite explaining further variance, past behaviour cannot explain why future behaviour occurs and therefore has no utility. Like Melstrad (1966), however, Norman and Conner (2005) point to habit as an important influence on future actions which is affected by past behaviour. They describe habitual responses as automatic and effortless performances

that are most likely to occur for frequently required behaviours and in stable contexts. Habit has been found to be an important predictor of breast self-examination, for example. Infrequent behaviours, which are more likely to occur in varying contexts, are more likely to be governed by deliberate, belief-based decision-making and intentions (Leventhal & Mora, 2008; Norman & Conner, 2005). Yet in research of the role of automaticity in TRA/TPB, even routine behaviour depended on intention (Fishbein & Ajzen, 2010; Ogden, 2007). Arguably, cervical screening usually occurs less frequently than annually and belongs in this category, but Norman and Conner (2005) cite research in which past behaviour does explain attendance at infrequent health checks.

Psychologists have chosen to recreate the characteristics of habits which arise from repeated performance (Leventhal & Mora, 2008; Norman & Conner, 2005). While this pragmatic strategy appears to help motivated people to initiate effortful behaviours, it fails to explain how behaviours are performed by people who do act on their intentions—unless effortful behaviours are defined as those which people fail to perform, despite being motivated (Bandura, 1991). Clearly this area requires further research, not least because measures of habit have usually been operationalised as past behaviour, rather than as assessments of automaticity. Thus the argument has become circular (Norman & Conner, 2005). Such use of past behaviour measures might also explain why habit variables are absent from continuous EVTs: the commonly cross-sectional investigations often use past behaviour as an outcome measure (Ogden, 2007).

The role of rationality in behaviour change

EVTs assume health behaviour and behaviour change are based on rational decisions about actions in order to achieve what is best for the actor. Consequently, interventions have focused on educating people about the health risks of some actions and the health benefits of others, manipulated social expectation, reduced barriers to increase control, and have taught strategies to overcome natural drives or learned habits (Strack & Deutsch, 2004). The breadth of EVT constructs, from decisional balance to anticipated regret compelled researchers to conclude that behaviour is likely multiply determined (Strack & Deutsch, 2004; Weller & Campbell, 2009). Mounting evidence, however, suggests that rational decision-making is one of two simultaneous cognitive processes vying for control over people's behaviours (Epstein, 1994; Kahneman, 2011; Strack & Deutsch, 2003; Strack & Deutsch, 2004).

Epstein (1994) and Kahneman (2011) explain that dual-process models describe an interplay of deliberation, which is a slow, rational, analytical process that is easier to verbalise and uses more abstract thought, with intuition, which is fast, automatic, rooted in affect and experience, more difficult to verbalise and a more natural way of cognitive processing. Strack and Deutsch (2004) understand deliberation as a reflective, logical, rule-governed, and therefore easily learned, process. It occurs in conscious awareness, but its use is optional and depends on available capacity and the thinker's motivation to engage in it. In contrast, Strack and Deutsch explain that intuition is an associative process structured by perceived similarity and mental proximity of schemata. As it occurs automatically and outside of conscious awareness; therefore it requires repeat exposure in so far as it is learnable.

Intuitive, or implicit, processing is inherently liked with affect. (Epstein, 1994; Epstein et al., 1996; Kahneman, 2011). On the one hand, automatic intuition creates affective responses to an issue, such as cervical cancer, when faced with the decision whether to obtain a Pap test (Strack & Deutsch, 2004). The occurrence of intuition is so immediate that rational deliberation must fail to prevent any affective reaction (Epstein, 1994), like fear of the illness or the Pap test procedure. Affective attitudes are more rapidly accessible and held more strongly than cognitive attitudes, and thus, can influences behavioural choices more immediately (Peters & Slovic, 2007). Thinking under affective arousal, on the other hand, becomes increasingly unreflective (Strack & Deutsch, 2004), and affective attitude towards a behaviour will influence a person's beliefs about its risks and benefits (Kahneman, 2011). For example, people weigh the costs of a behaviour more highly than its benefits, if they are assessing it under negative hedonic affect. The anticipated discomfort during cervical screening could thus have more influence over screening behaviour than the intangible benefit of avoiding the illness in the future. Although deliberation can correct such beliefs (Peters & Slovic, 2007), intuition seeks a coherent understanding and will influence what information will receive deliberate attention. This influence creates a confirmation bias (Kahneman, 2011). In addition, affective stimuli are able to influence affective attitude as well as cognitive attitude; cognitive stimuli, like factual information, however, have no impact on affective attitude (Peters & Slovic, 2007). Statistics about the decrease in cervical cancer incidence achieved through screening, for example, may not reduce fears of an abnormal Pap test result or of undergoing the Pap test itself.

Initially, dual-process models were used to understand thinking processes and attitude change (see for example Epstein, 1991 and Chaiken, Liberman & Eagly, 1989, respectively, as cited in Strack and Deutsch, 2004), only recently have their insights been applied to social behaviours. Epstein (1994) explains that dual-process thinking results in two ways of knowing: deliberation leads to intellectual knowledge, while intuition results in affective or experiential insight. In terms of persuasive information provision experiential comprehension is more compelling than abstract factual knowledge. Consequently, people process narrative formats more readily, as it is similar to vicarious experience, seemingly occurring as sequential events in a time and place among relatable characters (Epstein, 1994). Kahneman (2011) further points out that this type of information processing is preferable to people over deliberation, which is effortful, whereas intuitive thought occurs automatically and might occur unchecked by deliberation. As a result, easily processed messages create a sense of goodness about their content that is likely to be associated with truth or familiarity. Such messages are therefore more persuasive. Effortless processing, or cognitive ease, can be evoked also by repeated exposure, a clear display, priming or general positive affect of the thinker. Consequently, good choices are particularly difficult under certain circumstances. Thaler and Sunstein (2009) suggest that people struggle with decisions that have some immediate cost and delayed benefits, which they make infrequently, about which they receive no feedback to suggest whether they could have chosen better, or which require them to know their own preference well. For such decisions, the authors advocate libertarian paternalism, which will make easiest to choose that option which would be in the best interest of the chooser. They suggest a range of approaches to make options easier to choose, including incentives, which have successfully reduce tobacco smoking, or improved physical activity and health screening participation (Giles, Sniehotta, McColl, & Adams, 2015), as well as default options, which have helped to increase organ donation (Johnson & Goldstein, 2003).

Little research has been conducted on dual-process models in relation to cervical cancer prevention. Posting screening invitations to all women eligible for the NCSP could be considered an opt-out policy that makes programme enrolment a default option. This approach has been found to more effective than most other strategies, it creates a new choice, however, which is how to respond to the screening invitation (Weller, Patnick, McIntosh, & Dietrich, 2009).

Some evidence is available, however, on the effect of narratives. Hilton and Hunt (2010) examined the newspaper coverage of Jade Goody's experience of cervical cancer. They conclude that newspapers emphasised Jade Goody's personal experience over risk factor or symptom information. This media coverage can be said, therefore, to have provided a narrative rather than factual information. Alongside the media coverage, the UK recorded a significant increase in cervical screening attendance, which continued for several months following Jade Goody's death form cervical cancer. Younger women and those who were over-due for screening appeared to be particularly encouraged to attend during this period. Survey participants themselves, especially those of lower socio-economic status or education, reported to have felt influenced by the media coverage (Lancucki, Sasieni, Patnick, Day, & Vessey, 2012; MacArthur, Wright, Beer, & Paranjothy, 2011; Marlow, Sangha, Patnick, & Waller, 2012). The associated increase in follow-up and colposcopy appointments indicates that the Jade Goody Effect had tangible health protective benefits (Lancucki et al., 2012).

A similar effect was observed when a UK soap opera included a story line of a main character dying from cervical cancer (Howe, Owen-Smith, & Richardson, 2002; Richardson, Owen-Smith, & Howe, 2002). In this instance, however, the proportion of women attending additional Pap tests within their three-year screening interval grew, increasing resource use without greater public health benefit (Howe et al., 2002). Although such behaviour was not observed as part of the Jade Goody Effect, this is a significant concern for the use of cancer death narratives (Howe et al., 2002). A long-term follow-up of the soap opera effect found that television series had primarily a short-term effect (Owen-Smith, Howe, & Richardson, 2003). Howe and colleagues argue that due to the great public interest in the story line, other media also began to focus on this topic and it is therefore difficult to ascertain accurately the cause of the increased screening attendance following the television series. This argument is also true for the cross-sectional research on the Jade Goody Effect.

Experimental studies of the effect of narratives have yet to be completed in relation to cervical screening. A narrative intervention to increase bowel cancer screening participation, however, showed that narratives can be used to encourage screening-conducive health beliefs which in turn increased intentions to complete bowel screening (McGregor et al., 2015). Howe and colleagues (2002) warned that the television narrative relied on fear mongering and hindered informed decision-making by its atypical portrayal of cervical cancer. This story line was written without expert health

advice and McGregor and colleagues' study demonstrates that narratives can have a role in informed decision-making and without having to increase patient fears.

In conclusion, intuitive processes are worth considering in addition to the rational decision-making described in EVTs. In fact, intuition might already be inadvertently implied in EVTs: McGregor and colleagues (2015), for example, showed that narratives can influence health beliefs and intentions, while the effects of both, vicarious experience through narrative and easier choice through incentives, have been discussed above in relation to SCT, and Knops-Dullens and collaborators (2007) noticed the differential effect of affective attitude on decisional balance.

Concluding remarks

A variety of behavioural and behaviour change theories have been used to explain cervical screening participation. In this chapter I have laid out the reasons for researchers' difficulties to agree on the most useful of these theories (Brewer & Rimer, 2008; Conner & Norman, 2005). Consequently, researchers have chosen, and combined, constructs from various EVTs in a pragmatic manner (Luszczynska & Schwarzer, 2005; Schwarzer, 2008a). This practice, however, has made studies of EVTs difficult to compare.

In summary, EVTs are based on the assumption that people process information rationally. They can be differentiated into continuum-models, including HBM, TRA/TPB, SCT, and PMT, and stage-models, including TTM and HAPA. Stage-models recognise the sequential nature of behaviour change. They therefore include changes in the determinants of behaviours, as stipulated by continuum-models, as outcomes and differentiate motivational and volitional phases. Applications of continuum- and stage-models suggest that both provide insights into behaviour change and often their combined use would be most practical. Nevertheless, one disadvantage of tailored interventions, which are based on stage-models, is their requirement to assess the behavioural stages of people. This task can be impractical, especially when some time passes between stage assessment and intervention exposure. It is uncertain whether people shift between stage in the intervening time. Furthermore, in application to cervical screening consensus over how the behavioural stages are defined has yet to be reached. The value of tailored interventions therefore will remain unclear until standardised operationalisations and more accurate measures have been achieved (Spencer et al., 2002, 2005).

Moreover, there are several practical issues with EVTs. Diverging definitions of constructs, differences in their operationalisation and variations in their measures hinder the identification of the most useful EVT in application to cervical screening participation. Greater standardisation of measures and operationalisation would ease comparisons. TRA/TPB stood out as the model which described most clearly the relationships between its constructs and their assessment, aiding operationalisation. Although the literature provides a range of values, TRA/TPB also explains a comparative large proportion of intentional and behaviour variance, given its small number of predictors. Sutton (1998) argues that explaining 100 percent of the outcome variance was unrealistic given extraneous factors that limit the proportion of variance that EVTs can explain. Such extraneous factors might include measurement errors, but also idiosyncratic influences which occur so infrequently that EVTs exclude them. Researchers have attempted to improve the predictive power of their models by adding or deleting predictors. This habit, however, makes research findings difficult to compare and theorists caution that this drive for sufficiency can impair a model's parsimony. Ajzen (2011) applies this argumentation to attempts to introduce emotional constructs to TPB and maintains that emotions were already included in the model as part of affective attitude.

At the theoretical level this chapter identified considerable overlap of constructs across EVTs. Thus, perceived threat is included explicitly in HBM and PMT, and is said to affect attitude as measured by TRA/TPB. Further, if perceived threat is understood as including a risk of social disapproval, perceived threat might even affect subjective norm. In addition, social influences are such a potentially broad concept that the individual contribution of social aspects is problematic. Similarly, contextual influences indirectly affect behaviour through attitude, subjective norm and PBC, which makes their contribution difficult to understand. SCT, on the other hand, explicitly considers contextual influences as enabling or disabling environments. It can be argued that definitions of disabling environments overlap with the concept of perceived barriers. There is also an on-going debate over the relationship of perceived barriers, self-efficacy, PBC and LoC. While the inclusion of inhibiting constructs or control variables in most EVTs suggests that there is consensus over its importance for explanations of behaviour, a better understanding is required of which aspect of behavioural control or obstacles is salient to explanations. Such overlap demonstrates the need for the conceptual integration of EVTs. The conceptual overlap also suggests that theorists can

agree on a set of predictive constructs, but not on a common language to describe these. Several integrative efforts have converged on a number of constructs including cost – benefit balance or attitude, social influences, control, and intention. There is less agreement on the necessity of having the required behavioural skills and the absence of environmental constraints, or the role of self-image, knowledge, perceived threat, and cues to action. Additional research is certainly required to complete this effort.

Furthermore, EVTs are better predictors of intention than of behaviour. Reciprocal causality between attitude and behaviour appears to be implicated in the intention – behaviour gap. There is now a general understanding that a motivational and a volitional phase are needed to explain behaviour initiation. It remains unclear, however, what effects the move from intention to volition. Evidence suggests that action-planning interventions can help people to move from intention to behaviour initiation, but the underlying processes require further research. In addition, continuum-models typically neglect the role of past behaviour. There is some uncertainty, however, around the utility of past behaviour measures for explaining, rather than predicting, future behaviour (Norman & Conner, 2005). Yet, habit formation is particularly important for frequently performed behaviours, but in order to understand the effect of habits better, its assessment needs to shift from past performance to the degree of automaticity in its performance.

Finally, the most recent research indicates that EVTs describe just one of two processes that influence intention and behaviour. EVTs can explain rational deliberation, but not automatic intuition. Intuitions generate affective reactions which in turn are likely to reinforce the use of intuition rather than deliberation. As a consequence people are likely to value the costs of a health behaviour more dearly than its benefits and to show a confirmation bias in the information to which they attend when they make a supposedly informed choice. Intuitive thinking is faster and effortless, which makes it instinctively preferable. Messages that cater to this process are easier to comprehend and appear to be truer by association. Narrative presentations of information lend themselves to intuitive processing. These might be useful in helping people in choose a behaviour by providing balanced information in an easily comprehended format. Research further suggests personally desirable default options for effortful choices and agrees with SCT on the benefits of incentives which provide a facilitating environment. Research on such dual-process models of decision-making is

required, however, to provide a better understanding of their connection to EVTs and their use in relation to cervical screening attendance.

In conclusion, it is impractical to compare the applicability of EVTs (Luszczynska & Schwarzer, 2005; Schwarzer, 2008a) and integrative efforts have yet to agree on a sufficient set of behavioural predictors (Conner & Norman, 2005; Smedslund, 2000). Consequently, a pragmatic approach whereby the participants will indicate a theory-independent set of predictors of cervical screening attendance is justified. Smedslund argues for the value of interview studies as a source of detailed information about a person's behavioural choices. Accordingly, I chose focus group discussions to gain an initial understanding of Irish women's views and experiences with cervical cancer screening.

Chapter 5

Screening "in the fullness of health": Women's views of cervical cancer prevention

~ Study 2 ~

Building on the ideas described by EVTs (see Chapter 4), the research presented in this chapter seeks to identify influences on screening attendance that Irish women describe as salient. The findings inform subsequent survey research and, thus, provide this bottom-up project with its foundations.

Previous qualitative research on Irish samples was presented in Chapter 1. European researchers have interpreted interviews about cervical screening from a range of perspectives. For example, Blomberg, Widmark, Ternestedt, Törnberg, and Tishelman's (2011) 30-year-old Swedish participants conceptualised health responsibility as aiming to preserve physical well-being, good looks, self-actualisation, and the ability to socialise. These perceptions appeared to be partly due to the media pressure to be healthy and to look good, but the medical system was also seen as expecting 30-year-old women to be healthy. In addition, similar to Bowe's (2004) Irish participants, women with abnormal Pap tests explained how the consequences of abnormal test results occurred so much later that the link to the Pap test was difficult to grasp. Blomberg, Widmark, and colleagues concluded that women with a focus on the present appeared to be less prepared for future illness and that it was these women's stage in the transition into adulthood that influenced their way of thinking about cervical cancer, rather than their Pap test history.

Forss and colleagues' (2001) found four types of attenders in their participants' accounts. Common to all four groups was a perceived need for early detection and the acknowledgement that the women themselves might be unaware of cervical cancer developing in their bodies. They knew about the purpose and procedure of the test and were generally familiar with health check-ups. In contrast, Bowe (2004) found that her participants were unable to recall the screening information leaflet or had not read it. They were also unable to listen to their smear takers' explanations before the test,

because they felt too anxious in anticipation. Nevertheless, the participants reported a desire for further information.

Forss and colleagues (2001) further debate how much and what type of information could lead women to attend screening, because different ways of reasoning can result in screening attendance and need to be considered. They concluded that invitation and educational campaigns based on health behaviour theories would be of limited help in encouraging screening attendance, as screening behaviour appeared to be influenced by many more factors than health behaviour theories were accounting for. The women in Forss et al.'s study appeared to understand their own screening attendance in socially acceptable ways and to agree that health professionals can have knowledge about their bodies that they have not. They showed an underlying trust in the efficacy of the Pap test and, through their screening attendance, seemed to assent to political long-terms decisions about their bodies.

One study (Blomberg, Ternestedt, Törnberg, & Tishelman, 2008) looked at the political nature of screening attendance in more detail. They interviewed women who had declined participation in the Swedish cervical screening programme. The participants saw organised screening as the public sphere encroaching on their private sphere. These women lamented the lack of self-determination in the programme: the intimate nature of the test required trust in the smear taker; therefore some women preferred to attend their own gynaecologists to a system-assigned stranger. They reported feeling under social pressure to prioritise protecting their health. Women with negative experiences of the programme felt subjected to the Pap test and felt the screening situation was disrespectful and degrading. They perceived the invitation as an effort to coerce participation in an ostensibly voluntary programme. This very much contrasts the accounts presented by Forss and colleagues (2001). Furthermore, women who chose not to attend Pap tests at all reported fatalistic beliefs about cancer and considered a healthy lifestyle to be an alternative way of preventing cancer.

Blomberg and colleagues (2008) stress that their non-attending participants actively chose non-attendance and could give voice to their reasoning. This is a rarely researched group and Blomberg et al. wonder how these accounts would compare to those who fail to attend for Pap tests less deliberately. The authors argue that commonly reported psychological barriers (e.g. Bowe, 2004; Waller, Jakowska, Marlow & Wardle, 2012) seem insufficient to induce non-attendance. Research on what knowledge women use to make informed decisions would be more helpful than continuing to increase the

particular knowledge underlying the biomedical method of decision making (Blomberg et al., 2008), which corresponds to Forss and colleagues' (2001) conclusions from their data of regularly attending women.

Recent research from the UK agreed with Bowe's (2004) findings and reports that both screening attenders and avoiders disliked the procedure and anticipated embarrassment or pain during the Pap test (Waller, Jackowska, et al., 2012). In addition, older non-attenders were more likely to report prior negative screening experiences and low perceived risk of cervical cancer as reasons not to have a Pap test. Apparently more common among older women was a weighing of screening costs and benefits that tipped the balance in favour of non-attendance. Waller, Jackowka, and colleagues found the information levels among their participants to be acceptable and interpreted older women's balancing of costs and benefits as evidence of informed decision-making.

In contrast—but similar to Bowe's (2004) conclusions—younger women held more positive attitudes and stronger intentions to attend, but reported more access barriers, which prevented these inclined abstainers from acting on their intentions. These women explained that their needs for flexible appointments to deal with time constraints were often a covert unwillingness to make time. Combined with low perceived risk as an excuse for apathy, this led them to procrastinate on making appointments. Using HBM the authors suggest that decreasing access barriers and using ad campaigns as cues to action might help these women to participate in cervical screening.

The European literature often presents similar findings as previous Irish research, though varying contexts mean differences exist, e.g. in the views of older women or in levels of knowledge. This study updates previous Irish uptake research after five years of organised cervical cancer screening. The European literature will offer additional perspectives from which the findings can be understood.

Methodology

Research design. Focus groups are a long-standing research tool in interview studies of cervical screening attendance (e.g. Agurto, Bishop, Sánchez, Betancourt, & Robles, 2004; Barata, 2008; Bigby, Ko, Johnson, David, & Ferrer, 2003; Blomberg, Tishelman, et al., 2011; Blomberg, Widmark, et al., 2011; Bowe, 2004; Erwin et al., 2010; Lee, 2000; Mangoma, Chirenje, Chimbari, & Chandiwana, 2006; Matthews, Berrios, Darnell, & Calhoun, 2006; Park, Chang, & Chung, 2006; Waller, Jackowska, et al., 2012). With a semi-structured interview schedule, their conversational nature provides a detailed

understanding of individual experiences (Breakwell, Hammond, Fife-Shaw, & Smith, 2006; Robson, 2002). Focus groups are uniquely suited to investigating the range of opinions on an issue and comparing the differing views of different categories of people (Krueger & Casey, 2009), such as women who attend screening and those who do not. Focus groups can also help identify what influences different opinions, intentions and actions (Krueger & Casey, 2009). Matthews et al. (2006) found focus groups useful for investigating a new area of research and Krueger and Casey agree that focus groups can be a starting point to inform larger-scale fixed-design research, like surveys or interventions. According to Waller, Jackowska, and colleagues (2012) the value of focus groups is in their ability to uncover and discuss in detail unanticipated views or concerns. Focus groups can also provide all this information more efficiently than single-person interviews (Park et al., 2006): the special dynamics of the groups, for example, allow the participants to remind each other of ideas to raise and to clarify their views in discussion which each other. This process is absent in individual interviews (Blomberg, Tishelman, et al., 2011; Blomberg, Widmark, et al., 2011).

Nevertheless, Krueger & Casey (2009) caution that other methods might be better suited to the discussion of emotionally charged issues, like cancer, or sensitive information, like reproductive health behaviours, which people are unlikely to be willing to share in a group. They argue that confidentially of sensitive information cannot be ensured in focus groups (Krueger & Casey, 2009). Contrasting this view, Blomberg and colleagues (Blomberg, Tishelman, et al., 2011; Blomberg, Widmark, et al., 2011) have found that sensitive issues are more easily investigated in groups rather than individual interviews. A maximum of six participants in each group limited the number of people receiving confidential information, but also maintained the group character. This groups size is similar to that of Blomberg and colleagues (N_{Group} = two to seven participants, Blomberg, Tishelman et al., 2011; Blomberg, Widmark et al., 2011) or Bowe (2004) whose previous Irish focus groups on cervical screening ranged from two to five participants. In order to emphasise confidentiality, I reminded the participants before the interview that the views and experiences shared during the group interview were not to be discussed outside the focus group.

As the goal of this study is to observe how women experience cervical screening at this stage of the NCSP, the analysis approaches the data inductively; so rather than fitting the views of the participants into preconceived categories, the data themselves suggest the categories. Thematic Analysis according to Braun and Clarke (2006) allows

for this process. The authors explain this method as a highly flexible way to organise, describe and interpret qualitative data.

The analysis focuses primarily on the semantic level, because this study seeks to create an inventory of women's opinions. I did note relationships between the participants' beliefs throughout the analysis as well as my interpretations of them; but explanations of the origins of the participants' opinions are peripheral to the analysis. The THBs informed the analysis: their constructs provided a framework within which to understand the participants reasoning.

Epistemologically, these decisions base this study in the realist framework, which permits an analytical disregard for the focus groups' social dynamics, which have little relevance to the aim of this research.

Sample size and sampling. This study focuses on women aged between 25 and 60 years—the target age range of the NCSP. Women who were too young or too old for a free NCSP Pap test were excluded from this study, as they might face additional access barriers that are potential confounders. Further, to control for influences outside of Irish culture, women who had been born outside Ireland or had lived outside Ireland for more than a year were ineligible for participation. Although some women who have had a hysterectomy might need to continue Pap testing (Dunleavey, 2009), all women with a hysterectomy were excluded to avoid confusion among women who are unsure whether they required further Pap tests.

Three focus groups with up to six women for three different screening patterns were anticipated: *regular screeners* are women whose last Pap test was within the guidelines set by the NCSP, i.e. 25- to 44-year-olds had a Pap test less than 3 years ago, and 45- to 60-years-olds had been screened less than 5 years ago. This is considered a recent Pap test. *Irregular screeners* are women whose last Pap test was less recent than the interval set by the NCSP. Women who have never had a Pap test are *unscreened women*. Thus, 54 women were expected to be recruited. This sample size is considered sufficient to reach saturation (Matthews et al., 2006; Ritchie, Lewis, Nicholls, & Ormston, 2013; Robson, 2002).

In order to make a diverse part of this population aware of the study, I used multiple channels of recruitment. I sent poster advertisements (see figure 5.1, Appendix C, p. C – 2) to GPs' practices, churches, health and community welfare centres, beauty salons, post offices, libraries and women's associations. I published additional advertisements in local newspapers, on social networking websites (e.g. Facebook), parish newsletters and

the university homepage. I also informed staff and students of the university about the study via email and encouraged local community health nurses to tell female patients about the study. Framing the interviews as a meeting over tea and cake, the advertisements informed about the study's topic and asked interested women to contact the researcher.

Method

Participants. In total 34 women contacted me. Three women were ineligible for participation. Of the remaining 31 women only one was an irregular screener and four women were unscreened. Groups could be arranged for 19 of the 29 regular screeners, 13 of whom participated. Six women were invited, but did not attend the focus groups. Saturation was reached after four focus groups. Insufficient numbers of irregular and non-screeners had been recruited to conduct focus groups with these women. Table 5.1 summarises the characteristics of the participants in each focus group.

Table 5.1

Participant characteristics

Group	N	Age range (median)	Pap test attendance	Occupation (N)
1	4	27 – 41 years (31.50)	up-to-date	nurse (1) doctor (1) student (2)
2	2	26 years, 49 years[a]	up-to-date	nurse (1) student (1)
3	3	28 – 60 years (45.00)	up-to-date	nurse (1) student (1) not reported (1)
4	4	26 – 60 years (27.50)	up-to-date	lecturer (1) pharmacist (1) student (2)

Note. Total N = 13; [a] no median calculated, as N = 2.

The participants were between 26 and 60 years old, born and raised in Ireland and had received a recent Pap test. Eight of the participants worked in the health care sector.

I interviewed a pharmacist, three nurses, a doctor, a medical and a massage therapy student, as well as a health care sociologist.

Setting. The interviews were conducted in four focus groups: two groups of four women, one group of three and one group of two participants. The meetings took place in a conference or teaching room at the School of Applied Psychology which was dedicated to the interview to facilitate privacy and minimise disturbance. A female assistant helped with welcoming the participants and took notes to supplement the audio recording of the interview.

Materials. In accordance with Krueger and Casey (2009) the interview schedule progressed from general questions to more personal ones (see Appendix C, pp. C – 3). Based on the predictors found in previous research, the questions focused on information levels, attitudes, perceived benefits, feelings about and perceptions of the Pap test, as well as desired improvements. I referred to the questioning routes published by Andrasik, Rose, Pereira, and Antoni (2008), Guilfoyle, Franco, and Gorin (2007), and also Lee (2000) for inspiration.

Data collection. The semi-structured interviews lasted for approximately 2 hours, including an introductory briefing.

At the arrival of the last participant I began the interview with a short introduction of the study, the assistant and myself. Anonymity, confidentiality and the voluntary nature of their participation had been explained before the women gave informed consent and I reminded them during the introduction and explained the customs of the focus group (see Appendix C, p. C – 3).

Then I interviewed the participants according to the interview schedule. Although the interviews were audio-recorded, the assistant took note of the order of speakers and any other noteworthy events during the interview to aid transcription. The participants' names were changed to pseudonyms during transcription to anonymise the data. Appendix C (pp. C – 5) provides an extract of a transcript.

Analytical procedure. In accordance with Braun and Clarke (2006), I familiarised myself with the content during transcription and active reading thereafter. The transcripts were line-coded successively (see Appendix C, pp. C – 9 for an example) and the codes were compared to each other and to their respective data extracts to review their legitimacy. After removing duplicates, I grouped the codes into themes, which were categorised in turn. Constant comparison resulted in the merging and division of some themes and categories and introduced sub-themes and sub-categories. In the final

step the categories were merged into perspectives on cervical screening. Major decisions and turning points in the analysis were recorded in memorandums. Table 5.2 in Appendix C (pp. C – 14) shows an extract of the progression from line codes to perspectives.

Analysis

Key findings. I identified seven perspectives from which the women explained their screening uptake, as shown in figure 5.2. Firstly, the participants' prior screening experiences have to be considered as important influences on their intentions for future Pap tests. The women reported screening barriers and ways in which they were able to overcome them. Intra-individual perspectives look at personal characteristics and beliefs that influence screening attendance. In contrast, inter-individual aspects might affect attendance through social support as well as subjective norms, and the participants' perceptions of unscreened women might indicate important factors in screening attendance of which the participants were perhaps less aware. Attitude can show how their perceptions of cervical screening affect attendance. Understanding focuses on the participants' perceived and true levels of information about cervical screening. All of these factors might influence the decisions the participants made about cervical screening; there is evidence, however, that screening attendance did not follow from careful deliberation.

This summary of the findings exposes two dichotomies in the participants' viewpoints: inter- and intra-individual perspectives warrant comparison; and understanding of cervical screening as a rational perspective might oppose attitude, which appears to be an experiential evaluation of screening. The remainder of this section will focus on each perspective in detail and discuss these dichotomies.

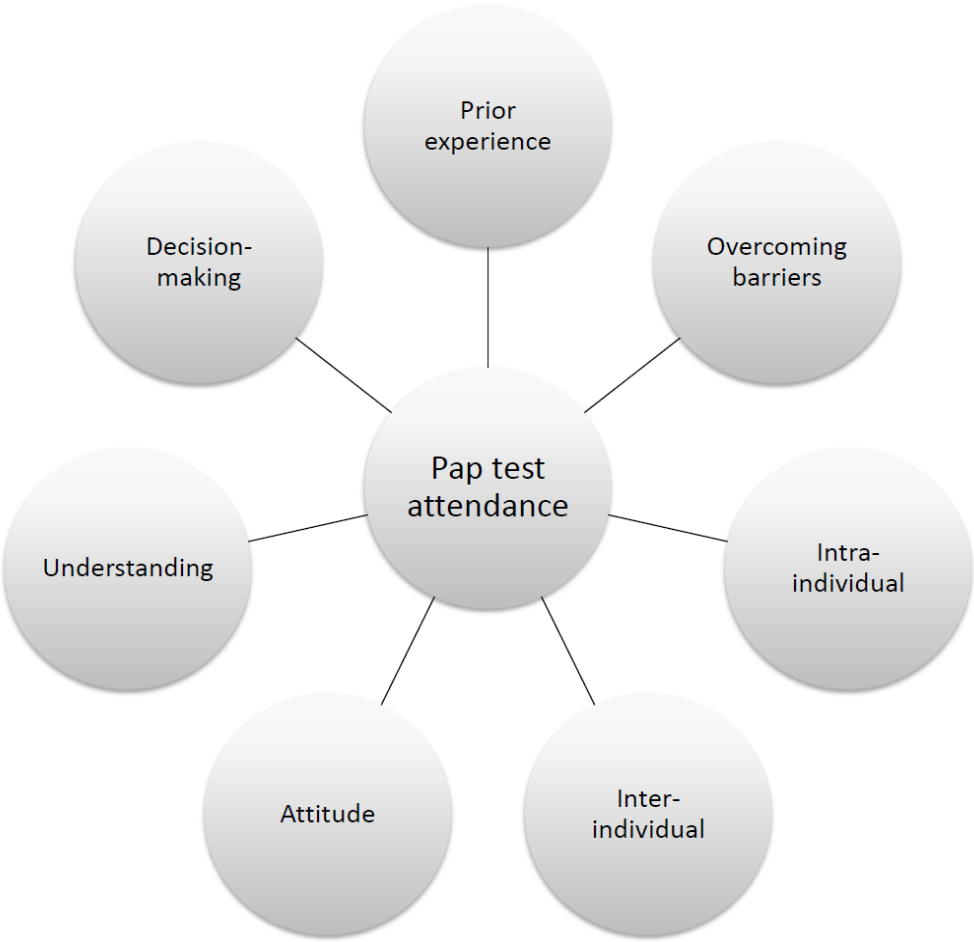

Figure 5.2. Perspectives on cervical screening uptake

Prior experience. The participants' level of experience of the Pap test varied by age. Older women reported having had multiple Pap tests and most of the younger women had only had one Pap test before the interview. This could relate to parity, as many of the older women reported post-natal care as an important opportunity for Pap tests.

Since many of the participants worked as health care professionals, the sample had considerable health care experience, from both the patient's and the provider's perspective. Some of these women also had experience of performing Pap tests, but apparently those experiences fail to ease Pap test uptake for them. Judy (G1, 41)[5] explained that performing Pap tests did not prepare her for obtaining one and Helen

[5] Participant information uses the format (G1, 41) to signify group 1, aged 41 years, for example.

(G4, 26) felt under pressure to relax herself after asking patients to relax when she performed the Pap test.

> … while I'm happy to do do anything to anybody, but to have it done to myself is totally different … (Judy, G1, 41)

Most of the participants reported having a regular source of care, commonly they were registered with a GP. No-one reported being without a regular source of care, though some women only saw their GPs irregularly: "… thank god I never have to go to the GP …" (Helen, G4, 26). This might relate to a common habit among the participants to delay GP appointments until multiple issues had arisen. Laura (G1, 36) explained, however, how repeated health care visits are conducive to her Pap test attendance, while Amy (G3, 28) had a different experience: although she was seeing the doctor frequently for diabetes and high blood pressure and had been treated for polycystic ovaries the previous year, she was apprehensive about her first Pap test.

Laura (G1, 36) also reports early experiences of the NCSP through the pilot programme, which might be as important as previous health care visits. Similarly, Barbara (G2, 26) had engaged in female reproductive health care since adolescence and Doris's (G3, 45) time in London exposed her to cervical screening as a young adult.

While the experiences of these women appear to have been positive, Sarah (G1, 27) had found her previous experience at the colposcopy clinic dissatisfying. Her intention to have a Pap test appears to be impervious to this experience though.

> … the colposcopy I had was a male doctor, was a bit old, […] I was a bit cringy about that […] after the two abnormal smears the colposcopy was *delayed* by so much […] it was like maybe it was more than 2 months […] and then I got a letter […] it was [really badly done], it said […] 'You you had your LETTZ procedure and results were as expected' […] what exactly does that mean? … (Sarah, G1, 27, emphasis in original)

Finally, women with some prior experience of abnormal Pap tests had a more positive attitude to them than women without prior experiences, who were afraid of the prospect. Most women—except Laura (G1, 36) and Sarah (G1, 27)—had had only normal Pap tests. Carla (G2, 49), however, who had experienced friends' abnormal test results explained that her friends' follow-up Pap tests had always been normal. Thus,

she also held a positive attitude to abnormal Pap test results. Seemingly, prior experiences lowered the participants' anxiety.

> … I know that can happen, they send you out for a second one to check it out straightaway like you know, but ehm, I I wouldn't take any notice of the first positive really like at all at all … (Carla, G2, 49)

Overcoming barriers. Barriers exist even among regularly screening women. Yet, their behaviour shows that they were able to overcome these hurdles. This section looks at how they achieved this.

Dealing with access issues. Although the test is available to the participants for free, cost was mentioned as a barrier to the Pap test. The women's inclinations to avoid the test, if they had to pay for it and their explicit appreciation of free Pap tests are evidence that the NCSP has overcome an important access barrier.

The participants found that the need to make appointments decreased accessibility, "when people are working and running around in circles …" (Carla, G2, 49). Women pressed for time had difficulty booking an appointment and attending the appointment. They also lamented waiting room delays and inconvenient surgery opening hours. Consequently they found themselves delaying the call to book the appointment despite feeling the need for a Pap test. These women concluded that reducing constraints on time could increase Pap test uptake.

Some women suggested the NCSP might make Pap test available without appointments. Others argued, however, that women could delay their Pap tests even more easily. They saw sufficient benefits in the appointment system to suggest pre-set appointments in the NCSP invitation letter as a useful alternative. The apparent contradiction between these views suggests that the apparent lack of time is in fact a reluctance to *prioritise* the Pap test over competing demands on the women's time, which turn time constraints from an access issue into a psychological barrier.

Overcoming psychological barriers. The participants emphasised psychological barriers over structural barriers. Laura (G1, 36) explained that she found the reminder necessary to counteract forgetting, i.e. a cognitive barrier.

> … I wouldn't go for it if, like, they didn't call, I probably wouldn't, ehm, be like 'Oh, I have to go for a smear test' […] I actually wouldn't remember anyway I think, […] cause so long passes, see, between […] the last time you had it done, […] I think it was probably around two years ago, but I can't remember exactly when I had it done; so […] when you're on a register […] they have you on file that way that they remind you after certain number of years (Laura, G1, 36)

In all of the groups women reported having been reminded to get a Pap test. For most of the participants Pap test reminders functioned as cues to action. They could take the form of chat among friends, self-reminders, or, commonly reported, NCSP letters. Some participants reported being cued by a particular birthday. Other Pap test reminders included social pressure, passing the GP's surgery regularly and reminders by health care providers.

> … we're all going in around the same, so we'll remind each other … 'Did you get yours?' […] that works out very well, but because we're, a lot of the girls I'd be working with now are in the same age group …
>
> (Carla, G2, 49)

Most women obtained their test when prompted by the invitation, though despite their up-to-date records, some women required extra encouragement. Kate (G4, 26) reported receiving three letters from the NCSP before she obtained her test. Others had ignored it in the past or had remembered to have a Pap test without the invitation. Two women reported being missed by the NCSP, although they were aware that they should attend for a Pap test. In addition, several women reported receiving invitation letters when they had had a Pap test recently. Consequently, there was some doubt of the effectiveness of the invitation letter. In addition to helping women prioritise screening, Helen (G4, 26) suggested pre-booked appointments could increase its effectiveness as a cue:

> … the only, thing I would consider tryin' to, maybe tweak a bit, is that, you might be kinda tied down more to 'Look, come and have it now and it'll all be over and done with' not you know 'Make an appointment yourself'… (Helen, G4, 26)

Furthermore, a commonly reported barrier was anxiety. At the most general level some participants described themselves as worriers, as feeling anxious in the absence of certainty. Anxiety that might prevent women from obtaining a Pap test related to general fears of medical procedures or the Pap test procedure in particular, being afraid of being stigmatised for having the test and fear of abnormal results. Especially, the younger participants reported fear of the test procedure. Some women preferred to ignore things that might upset them, including Pap test results and personal risk factors for cervical cancer. Interestingly, a few women who shared this habit used it to avoid information that would prevent them from having a Pap test as opposed to avoiding the test itself.

> And there's always the, eh, the anxiety too, about, you know 'Will the results be okay?'… (Freda, G4, 60)

> … I do remember being quite apprehensive after the conversation with the friend of mine who was talking about the whole, you know, sterilisation of instruments […] I would have rather not [laughs] had that conversation (Freda G4, 60)

Discomfort during the test, whether physical or psychological, appeared to be the women's most important barrier to the Pap test. The participants experienced negative affect during the test. Many women reported that the intimacy of the Pap test procedure caused them to feel uncomfortable, vulnerable and embarrassed.

> … it's just not really normal to have somebody else, you know, having a good look like … (Helen, G4, 26)

> … they're down where, no-one should be … (Carla, G2, 49)

> … just that I'm vulnerable I suppose, and that I'm lying in that position […] exposed … (Erica, G3, 60)

As Erica's (G3, 60) comment suggests, some of the women also felt humiliatingly exposed during the test. Particularly older participants attributed their feelings to their up-bringing. They perceived the culture in which they grew up as making women's health a social taboo. In order to minimise this feeling of exposure, they wore dresses or skirts to the test.

> … go in summer in a summer dress with no tights [laughs] that you have to be struggling with, and no trousers […] once you slip your panties down, there's no […] It's nothing (Freda, G4, 60)

Some women also desired to prepare themselves mentally for the test, although others could see advantages to an unplanned Pap test. Compare Helen's (G4, 26) and Grace's (G4, 29) experiences: their comments show that while some women might prefer mental preparation for this uncomfortable situation, those inclined to worry might benefit from less opportunity for contemplation.

> … knowing what's involved probably helps you to kind of, be prepared for that, kind of, bit of discomfort … (Helen, G4, 26)

> … that was actually a good approach then, because I had no chance to be apprehensive, literally, I was lying on the table and that was it (Grace, G4, 29)

Moreover, all of the participants agreed that the Pap test was uncomfortable, but only a few had ever found it painful or unbearable. Erica (G3, 60) and Grace (G4, 29) reported having complications during their most uncomfortable Pap tests, which perhaps explains the particular discomfort. In general, most of the participants found the level of discomfort acceptable. Some even reported having experienced pain-free Pap tests, for example during post-natal care.

Several women reported being afraid that their next Pap test might be painful. Laura (G1, 36), for instance, worried more about this than about the results of the test. The women in one group suggested that patient expectations were partly responsible for the level of discomfort women experienced during the test:

> … if you tell somebody that the … cervical smear is going to be really really painful […] They're going to be really really tense […] And then it's more likely to be painful … (Freda, G4, 60)

To overcome the discomfort, the participants had cognitive and emotional strategies. All women reduced physical discomforts by relaxing during the procedure. With the exception of Erica (G3, 60), none of the women reported using specific relaxation methods, and a lot of them found it difficult to relax, particularly in the most

uncomfortable moments of the procedure. Their interaction with their smear takers also influenced their ability to relax. They particularly appreciated distracting conversation and kindness:

> … a bit of kindness as well I think, especially, when you're doing something like that it just goes a long way to keep you relaxed
>
> (Carla, G2, 49)

The participants also mentioned concerns about being clean enough for the Pap test. This might relate to the normal odour and discharge of the female genitalia, as odour and fluids in other parts of the body might signal insufficient hygiene. The women were sensitive about this private area of their bodies and wanted to wash away the odour and discharge, in order to avoid being perceived as a person who neglects bodily hygiene. This is sometimes impossible, however, which makes the participants uncomfortable.

> Some women think that if you have a bit of a discharge or secretions that that's not normal and it's not nice and that […] the doctor might think they're dirty; d'you know? (Doris, G3, 45)

> … you'd even be uncomfortable, if you're made wait a while, because, things are gathering obviously [laughs] […] and that's being as clean as you can be … (Carla, G2, 49)

In addition, a few women related lacking hygiene to abnormal Pap test results. Mary's (G1, 27) comment suggests that her desire to be clean at the Pap test appointment could have arisen to show the smear taker that, if abnormalities were present, they were due to reasons other than wanting cleanliness.

> … it's like when you're going to the dentist when you want to brush your teeth 10 times […] But that's really gonna solve the problem [laughs]
>
> (Mary, G1, 27)

Finally, some participants could imagine situations that might weaken their intentions: "it's very easy to put things like that on the long finger …" (Mary, G1, 27). Having never been part of the NCSP and having reached the upper age limit for NCSP inclusion, Freda (G4, 60) was the only participant, planning to reduce her screening. All

other participants, however, intended to obtain Pap tests in the future. Some women even showed evidence of forming Implementation Intentions.

> … I'm definitely going to get the lady doctor the next time …
>
> (Carla, G2, 49)

> … next time I make the appointment […] I won't be making it for weeks in advance … (Grace, G4, 29)

It appears that, as these women attended for Pap tests, none of these barriers were insurmountable to them.

> … it's just momentarily embarrassing to […] have the test done, but, you know that, you're doing it for the right reasons … (Freda, G4, 60)

The participants' decisional balance favoured the Pap test. The following sections will consider other influences on decision making.

Intra- and inter-individual perspectives: Theoretical models (Ajzen, 1991; Hill & Gick, 2011; Wallston & Wallston, 1982) agree that certain personal characteristics and beliefs can make people more or less likely to look after their health, but no behaviour exists in a social vacuum. This section illustrates this relationship.

Personality characteristics. Certain personality features emerged from the participants' reports that appear to urge them toward Pap test uptake. Most women displayed optimism when they spoke about their Pap tests and about the test results. The women expected normal results after the test, and expected other women to have normal Pap tests—even if they had had abnormal Pap test results before.

Women who had been exposed to abnormal results—through their own or their friends' experiences—had an optimistic attitude to them. Carla (G2, 49), for instance, explained that all her friends' abnormal Pap tests had usually cleared at the 6-month follow-up. Those without exposure to abnormal results, however, hoped that any abnormalities found would be early cell changes that were easily treatable. Amy (G3, 28) was the only exception here. Observing the progress of a friend with cervical cancer, she had believed in the efficacy of cervical cancer treatments, but ultimately had been disappointed.

Furthermore, two women's accounts suggested that openness to experience might help them overcome the discomfort which they associate with the Pap test.

> … as I … get older, I'm kind of like, I wouldn't be as uncomfortable like … (Carla, G2, 49)

> No matter how much you know about it, you don't know exactly until you have it done yourself […] I think going back now the second time might be, I'll be totally fine … (Helen, G4, 26)

Helen's (G4, 26) comment shows that she worried about the procedure initially; but, after having had her first Pap test, she expected to be comfortable at future tests. Other participants also dealt with Pap tests more easily when they knew what to expect, which overall suggests limited openness to experience in these women. Openness is a continuum (John & Srivastava, 1999), however; and while Carla (G2, 49) appears to have few issues with discomfort, Helen's (G4, 26) case exemplifies how some women had overcome their initial apprehensions. Furthermore, accounts of feeling anxious whenever any aspects of their Pap test routines changed support the idea that openness is important in Pap test attendance.

Descriptions of anxiety indicate that neuroticism might impact Pap test uptake negatively and the participants classically used the metaphor of "being an ostrich" (Carla, G2, 49) to describe this process:

> … sometimes I maybe delay things, because I want to, I want to stick my head in the sand (Judy, G1, 41)

Some women, however, displayed few neurotic traits. Carla (G2, 49), for instance, describes herself as not being "a worrier" and as "too old to be intimidated". Other women specifically stated feeling relaxed before a Pap test and to worry little about the test result—even bad experiences failed to discourage them. Women who were likely to worry seemed to balance their fears of cervical cancer and those about the Pap test in favour of obtaining the test. The women's fear of becoming ill, for example, doubtlessly motivated them to obtain the Pap test. Their anxiety from delayed Pap tests or delayed treatment of abnormal cells further supports this conclusion.

General health motivation. The participants clearly valued their health and reported strong desires to maintain it: "I want to be *flying* when I'm 80 I don't want to be … zimmerframing" (Carla, G2, 49, emphasis in original), "… your health is your wealth…" (Amy, G3, 28).

Participants affected by chronic illness knew their health to be a transient state and some of the older participants had developed greater concern for their health with increasing age. These women, unsurprisingly, were becoming more aware of the transience of health as general ability was declining. Carla (G2, 49) admitted: "… I didn't give that one thought when I was your [refers to Barbara (26)] age …" The women's reports of being less health-conscious when they were younger, before being diagnosed with a chronic illness and, most importantly, before they had their first Pap test are in keeping with this argument.

In addition, eight participants worked in health care professions and the constant exposure to illness led these participants to appreciate their health:

> … I work in a hospital I hear horror stories about 18-year-olds and 19-year-olds and that actually keeps you very focused [laughs] in minding yourself in as much as you possibly can … (Carla, G2, 49)

The participants' motivation to stay healthy expressed itself in many ways: at the most general level the participants actively sought to avoid illness and engaged in behaviours that preserve health: "… I'm walking and keeping, you know" (Carla, G2, 49), or they saw their GPs regularly for illness prevention. The women's concern about their health before they experienced any symptoms and the satisfaction they gained from actively preserving their health further illustrates their general health motivation: "it's good to know that you're healthy like" (Carla, G2, 49).

In terms of cervical cancer, the participants never took their health for granted, but perceived it as durable only by maintenance: "… I have to get things checked […] to make sure everything is okay…" (Amy, G3, 28). Consequently, most of the participants seized the initiative regarding their Pap tests. They anticipated their next Pap tests and went to obtain them when necessary. Moreover, the participants expressed motivation, specifically, to avoid cancer. Some women conveyed this motivation through their desire to have their Pap tests in time: "You know the sooner you go the better, for yourself, in the long-run…" (Doris, G3, 45). Others, like Carla (G2, 49), were strongly determined to avoid cancer: "… I just don't want to be there if I can possibly help it".

Responsibility. From these accounts I ought to conclude that the participants felt very much responsible for their health. In their explicit comments on health responsibility however—be it general health or cervical cancer prevention in particular—they more often described to be *displacing responsibility* onto the health care

system than of *being responsible*—and that, despite their negative attitude to this lack of responsibility as evidenced by their guilt and embarrassment over doing this. The following two comments from Erica (G3, 60) illustrate the dichotomy:

> And I, I feel guilty when I don't go; you know, I feel guilty because the service is there and I'm not using it […] You know, and that I'm not looking after myself, you know (Erica, G3, 60)

> And, I suppose to take, personal responsibility […] The HSE won't go looking for you […] Well, they write you the letter, but, they don't care what you do with it […] You could frame it and nobody cares …
>
> (Erica, G3, 60)

Erica (G3, 60) had a history of somewhat irregular Pap tests and perhaps held the least favourable attitude to the test among the women. Her first comment indicates her feelings of wasted opportunity, but it also suggests an understanding that, ultimately, it is her responsibility to get screened. She elaborated on this understanding in the second comment, in which she also described her learning of the consequences of Pap test avoidance: "nobody cares".

Yet most of the women reported waiting for their letters before getting a Pap test or relying on their doctors to suggest the Pap test, like Barbara (G2, 26): "I'm waiting for my call under the HSE screening thing now" and Grace (G4, 29): "… with the GP it's it's a point for them to say 'Okay, now that that's done, it's good for you [to] know about these things'". Similarly, the women reported relying on others to provide information, like Barbara (G2, 26), for example: "… I wouldn't know an awful lot about unless you hear it in the media …" (Barbara, G2, 26).

In addition, some of the women felt obliged to wait for prompts due to misinformation. This suggests that the participants did aim to maintain their health and did take responsibility, but lacking information led them to shift this responsibility onto the NCSP and health care professionals unnecessarily.

> … I thought I might get a letter or somethin' to say 'You need to sign up' […] I didn't really think about it an awful lot, but it was down to me to get registered and I didn't realise that … (Barbara, G2, 26)

Health LoC. Control over illness is important to the participants; this is supported by self-reflective data. The participants' feeling of responsibility as outlined above presupposes an underlying internal HLoC. In contrast, lack of control caused them to worry and feel powerless against illness, and "there's nothing worse than feeling powerless" (Carla, G2, 49). Their reports of seeking to find out what is wrong with them when they are ill further confirm this desire for control.

Similarly, they expressed a preference to know if they had cervical abnormalities. Yet, the women felt that they had reduced control over cervical cancer, which they expected to be difficult to treat once symptoms were observable. Carla's (G2, 49) metaphoric comment below, describes the women's view of cervical cancer as attacking suddenly. She also points out the participants' appreciation of the Pap test as their only way of avoiding or discovering the disease and thus regaining control over their health.

> … it's like a case of a silent stalker, you have no knowledge of it, so this is your, this your only ammunition- (Carla, G2, 49)

Anticipated regret. Interestingly, their motivation to engage in health behaviours could stem from strong feelings of anticipated regret. Many participants almost expected health problems from avoiding the Pap test. Their reports focused exclusively on inaction regret and this might drive them to obtain the test.

> 'Yeah! You get that done now, otherwise –' [laughs] there's always a little voice […] the *price* people pay is too big, for not …
>
> (Carla, G2, 49, emphasis in original)

> … just get it checked out, cause it's not, it's ehm, even though it's not a nice feeling, the alternative is not good either (Amy, G3, 28)

Moreover, women who had delayed their Pap tests in the past reported negative feelings from doing so. Erica (G3, 60) explained how she disapproved of herself: "I feel guilty when I don't go" and Judy (G1, 41) appeared to derive feelings of adequacy from having a recent Pap test: "… but I'm okay at the moment, I'm up-to-date …" These feelings might act as deterrents from delaying or avoiding Pap tests in the future—or as encouragement to obtain the test.

Perceived benefits and rewards. The benefits that the participants gain from the test certainly encouraged attendance. The participants did consider the results an

incentive to get screened, "…especially like, then when you get the letter saying 'Yeah you are grand' […] that's great" (Carla, G2, 49). Normal test results reassured the participants:

> I think *personally* the thing that is good about it, is just that it does kind of put your mind at ease (Kate, G4, 26, emphasis in original)

Nevertheless, some participants argued that the benefits of the Pap test lacked immediacy: the participants placed great value on the Pap test results and could consider the test complete only when they received the results, because they had closure when they did so. Due to this feeling of closure, the time until they received their results was an important issue for the participants. But some women found that the four to six week turn-over time detracted from the feeling of closure. In consequence, the turn-around time also reduced the perceived rewards of the Pap test:

> … you, kind of, separate the two things, cause there's such a big gap between them that you're not really associating the results with the test … (Mary, G1, 27)

Moreover, they felt that the Pap test results usually confirmed their expectations, i.e. that their cervical cells were healthy. To these women the results lacked consequence and the test appeared to be without a significant outcome. This appears to be the flipside of the attendance-encouraging effect of optimism.

> … it's not the same kind of benefit you would have from, you know, having an exam to see how far dilated you are in pregnancy […] That leads to something … (Freda, G4, 60)

The participants also had positive feelings immediately after the test, however, which they perceived as rewarding. The women said that they felt good about themselves for having got the test: happy that they had gone and proud that they had found the courage. Most of the women also felt relieved after their Pap test. Relief from normal results is plausible, but the women also reported relief at the lack of the expected pain, relief that the test was over, and, most commonly, relief that the test was out of the way for the foreseeable future.

> … it's just more of a relief that, you know, it's kind of over and done with, as you [refers to Kate (26)] said for another 3 years […] Rather than this kind of absolutely, cause you're not expecting to be told anything is wrong with you […] and you're not get your results for 4 weeks anyway so, […] I think it's just kind of relief, that, you actually went and did it [laughs] as opposed to a big relief that everything is okay, cause you don't really know until the letter arrives (Helen, G4, 26)

Consequently, some women suggested more tangible rewards and rewarded themselves more concretely for having a Pap test. Amy (G3, 28) felt rewarded by her mother's approval of her obtaining the test. Doris (G3, 45) explained how she treats herself to teasing her husband, who is uncomfortable with female reproductive health care. Others suggested that material rewards could induce reluctant women to get screened.

> … make it like a … treat for yourself, go and have your smear and then go out maybe, and buy yourself a nice magazine and make it a day of of relaxing for yourself then, d'you know, your health is bein' looked after and d'you know? (Doris, G3, 45)

Readiness to act. The women's overall assessment of their own susceptibility to cervical cancer made these benefits all the more important. The participants in one focus group reported obtaining Pap tests to offset health-risk behaviours in which they had engaged in the past. Known risk factors appeared to increase the women's perceived susceptibility. On the one hand, one focus group emphasised their feelings of susceptibility and discussed the cancer histories of relatives in detail. On the other hand, the participants generally emphasised that they felt or in the past had felt unsusceptible to cervical cancer.

> **Judy (41):** … I have gone … maybe, a couple of years over, where I should have gone […] Again, I think it's the thought of 'Oh, it's not gonna happen to me' […] Which is stupid, it can happen to anybody [...]
> **Laura (36):** I suppose you're like, as well, like 'Oh, I feel fine' d'you know, so, … eh … like … nothing's gonna happen
>
> (Group 1)

Their perceptions contradict reports that perceived susceptibility to cervical cancer was a salient concern in the participants' Pap test uptake and pose the question whether these participants truly underestimated their own susceptibility or whether they simply failed to report it. Perhaps these women assumed to have implied high perceived susceptibility so clearly in their accounts that to report it seemed redundant to them.

> … just get it checked out, cause it's not, it's ehm, even though it's not a nice feeling, the alternative is not good either … (Amy, G3, 28)

This ambiguity could suggest a rational belief of susceptibility diverging from an intuitive experience; but considering the women's fear of abnormal Pap tests, it might equally indicate an unwillingness to admit to feeling susceptible.

Moreover, the women agreed that cervical cancer is a severe disease: "… it's not pretty, it's not good" (Carla, G2, 49). In particular, the young age of onset and the sometimes rapid progress of the disease, which they had observed in cervical cancer patients or the Jade Goody case in the media, worried the women. The significance of these observations further increased perceived severity because the women could relate to these cases. The psychosocial consequences of cervical cancer added to its perceived severity. Seemingly the more the participants knew about cervical cancer, the more severe they considered the disease to be.

> Parts taken off over the years, that were invasive, pieces taken off of the cervix and then, major surgery then […] It's all very traumatic …
>
> (Doris, G3, 45)

According to HBM susceptibility and severity create a state of readiness to act on one's chance of developing cervical cancer. This idea, however, also emphasises the importance of knowing what actions are possible.

Autonomy. Society's view of cervical screening constitutes an important aspect of the participants' experience. This section is about in how far society's view mattered to them. For instance, despite the feeling of control that women achieved through preventive health care, Grace (G4, 29) suggested that prescriptive cancer prevention disregards women's autonomy and individuality:

> … it's kinda taking it away from you, it's just, you're part of the bigger population, it's another thing that you have to do, because, the government says you have to, because, the public health authority say you have to… (Grace, G4, 29)

Freda (G4, 60) was the only participant to criticise the emphasis on women in reproductive health preservation: standard preventive strategies, like the Pap test, were medicalising women.

> I suppose like one of thee, the negatives, I suppose, is, that whole thing of the medicalisation of life […] You know, the number of preventative, eh, screening procedures now […] has become so … ridiculous […] and, the other thing […] is it's medicalisation of *women's* life cycle is so much, ehm, more than the medicalisation of male life cycle …
>
> (Freda, G4, 60, emphasis in original)

In addition, some women reported suspending their autonomy and individuality for the duration of the test and submitting to their smear takers as passive patients, to deal with psychological discomforts during the Pap test. Others described a process of mentally distancing themselves:

> … you get up, you know, they do their stuff and then eugh! [laughs] and it's all, it's all over … (Carla, G2, 49)

> Like I don't really find those exp-, […] I kind of get into a different mindset or something maybe? I just go 'Oh, they've seen it all before' I know they have (Laura, G1, 36)

Grace (G4, 29) explained how, in that process, privacy allowed the women to regain their composure and made them feel respected as people. Conceivably, the women needed this feeling of respect to trust in their smear takers to suspend their autonomy and they appreciated special efforts of their smear takers to give them privacy throughout the appointment:

> … I think she might have left the room, whe- when I took my trousers off to lie on the table and like that now, she left a towel or blanket or something, and then, when we were finished and she was tidying up her bits and pieces and she stepped out for a few minutes so, that I had a chance to put my clothes on again, which, you know, I felt then, when she came back into the room, I was sitting down, again as normal, so you know, it was like being at the beautician's almost … (Grace, G4, 29)

This trust appears to be strengthened further by their smear takers' supportiveness during the Pap test. Support was demonstrated by GPs who considered the test to be important, discussed it with the participants and offered the test to them. Moreover, reassurance from their smear takers was paramount. Different women required different levels of reassurance, but everyone expected to meet a reassuring smear taker—however, nobody considered how they could make *themselves* more comfortable: "… there's probably a bit of an onus on them to try and make patients feel comfortable" (Mary, G1, 27). All women had experienced positive relationships with at least one of their smear takers. Only Doris (G3, 45) reported meeting an unsupportive doctor for a Pap test:

> … they wanted me to have a smear test […] and my GP went 'Not at all! You don't need that done; you had your smear test done … a year ago' […] and she really, I had to say to her 'I came here today to get … a smear; that's why I'm here, that's why I'm paying you money!' […] And she was very, I was very, I was surprised at her… (Doris, G3, 45)

These views show that there are two concerns around autonomy in cervical screening. The first one relates to government policy affecting the participants' self-determination whether or not to have a Pap test, which equals the decision of who does what to a woman's body and when. The second one is about passivity and vulnerability that diminish autonomy during the Pap test procedure. A positive relationship with their smear takers appears to be vital for the participants to accept this experience.

Social support. In addition to the relationships with their smear takers, the participants' relationships with other women appear to be influential in Pap test attendance. Through the exchange of their experiences with others the women provided

and gained informational and emotional support. Although only Amy (G3, 28) directly expressed a need for social support in order to have Pap tests, most of the remaining women conveyed this need when they recollected their experiences of talking about the Pap test with others. The participants talked about their test results, good and bad experiences they had had and how they felt about the test. The women also advised each other, by giving practical information: "I said 'If you don't wanna go to your GP, go to [the family planning clinic in] Tuckey Street'" (Doris, G3, 45), and by giving advice on dealing with anticipated discomfort from the Pap test.

Most women received social support for the test from their families, especially their mothers and sisters. Their colleagues were important confidants to those participants who were medical professionals; other women preferred to talk to close friends. All of them had at least one confidant, however, to whom they could speak about the Pap test; this demonstrates their need for such conversations.

> … I talk to my best friends about it […] I have one particular friend who's got it done once or twice … (Amy, G3, 28)

Although some women reported talking to men about their Pap tests, the general consensus was to expect little social support for the Pap test from men. The women expected men to feel uncomfortable talking about reproductive health care, or the Pap test more specifically, but they did desire this to change. One focus group discussed the implications of male hygiene in cervical cancer. This group also became aware of the effects of cervical cancer on men:

> **Helen (26):** See, I suppose they don't, suffer, most of the consequences […]
> **Freda (60):** Yeah, mind you in the long run they do, don't they? It's pretty horrific to lose your partner
>
> (Group 4)

Some women were particularly reluctant to introduce the topic, because they feared that they would make others uncomfortable. They also often felt uncomfortable themselves when talking about Pap tests and reported embarrassment, awkwardness and self-consciousness.

> Slightly like, even though, you're talking with friends, it's still slightly embarrassing talking about it; ehm, because it's such a private area
>
> (Amy, G3, 28)

These participants felt torn between its social benefits and avoiding their own and others' embarrassment by not talking about the test. In order to minimise their risk of embarrassment they took care to share only as much personal detail as necessary. They described their experiences of talking about Pap tests as mentioning the test to friends rather than detailed conversations.

Some women suggested these feelings were residuals from a past culture in which reproductive health care was a social taboo and explained that their concerns related mainly to discussing Pap tests in public. They perceived this topic as unsuitable for public discussion and avoided talking about Pap tests in public to prevent others from assuming that they needed information about a test associated with sexual health.

Others feared stigmatisation for obtaining Pap tests. Helen (G4, 26) and Barbara (G2, 26) explain how this issue arose from others' lack of knowledge rather than their own. Their comments show how misinformation can create psychological barriers to Pap testing.

> … there's people you wouldn't tell, cause immediately the first thing they think about is 'Wh- why did you need to go and get that done?'
>
> (Helen, G4, 26)

> … they may think that the cervical smear is related to the STI stuff and there may be a stigma around that… (Barbara, G2, 26)

Subjective norms. Considering the high level of social support that the interviewed women experienced, strong subjective norms to obtain a Pap test are unsurprising: women who reassure others about the Pap test are likely to want others obtain it. Thus, important influences on women's subjective norms were their friends and their mothers.

> … they're all having it done, it's just, somehow it just seems to be, you know, it's just part of, part of being being a girl … (Carla, G2, 49)

None of the participants reported that their subjective norm was avoiding Pap tests, although they reported to know of people who did avoid Pap tests. They excluded these

non-screeners from their social norm group: Judy (G1, 41), for example, distinguished herself from her mother and other non-screeners of her mother's age, who were arguably outside Judy's (G1, 41) peer group. Similarly, Laura (G1, 36) reported her friends to have started screening late or to avoid the test completely; but she differentiated herself from these friends:

> … they got everybody in Limerick on the scheme so, ehm, I would have probably started having smears before my before my friends that weren't living in Limerick (Laura, G1, 36)

Instead, the women applied their own subjective norm to non-screeners in order to peer-pressure them to obtain Pap tests.

> … my ehm, sister is 29 […] and she said 'Oh I need to have another smear, I don't know if I will' I say 'Oh my god! Go have your smear done' well I […] bully people into having their smear test (Doris, G3, 45)

> … I kind of found myself saying to them 'You know, it's not as bad as you think and it's very worthwhile and it's important and you should go' … (Grace, G4, 29)

Only one participant indicated disliking peer pressure to have a Pap test, while others considered it an important means of persuasion. A minority of women also reported obtaining Pap tests because they experienced social pressure through the NCSP. The participants' accounts showed they appreciated the use of subjective norms to encourage other women to obtain the test. In keeping with their wish to encourage others, the women chose carefully what they told others about the test. While they shared bad experiences with other screeners to receive social support, they omitted bad experiences when talking to non-screeners, as Grace (G4, 29) explained, to reassure them about the test: "I wouldn't go back telling her that story, cause sure, then that'd scare her." None of the interviewed women reported providing information to discourage others from obtaining a Pap test. With the current emphasis on informed choice in health promotion, it is interesting to note that these women favour persuasion over information provision.

Screened women's views of unscreened women. Moreover, the participants often mentioned unscreened women and possible reasons why non-screeners avoided the Pap test. Despite their supportive personal environments, the participants experienced a lack of social support for the Pap test at a societal level.

> **…** *if I wasn't working***,** […] the mothers that I meet from school or second-, I mean, there wouldn't be hope, because you don't have that level of confidentiality or comradeship […] you see there isn't women's groups like there used to be […] the whole community of women … isn't there as much anymore […] I don't know is it there, when people are working and running around in circles …
>
> (Carla, G2, 49, emphasis in original)

The participants also expected society in general to be unaware of the NCSP and to pay insufficient attention to the Pap test. The participants questioned the awareness of older and younger women especially.

> … my aunt was talking to me, she was kinda like 'Oh, should I go and do this? What is this about?' and really wasn't aware of […] why you're doing it … (Mary, G1, 27)

> … like they're in college, they got their 577 points or whatever, they, but they just aren't relating what they're learning to themselves …
>
> (Carla, G2, 49)

In addition, the participants expected lower levels of awareness among women under 25, despite them being sexually active. They desired earlier awareness, which fits with the participants' belief that information decreases anxiety: most participants reported that they would have liked to know about the Pap test before they first had it. Consequently, the participants desired the public to be better informed about the reasons for and advantages of cervical screening, but they also wanted realistic information to prevent false confidence. These topics were those that the participants themselves were most aware of and that were having a particularly strong impact on the participants' Pap test attendance.

Given their expectation that non-screeners must lack social support, awareness and information, the participants had difficulty understanding the avoidant habits of informed women.

> **Laura (36):** … there is a lot of fear around it, ehm, I just can't get over some of my friends who are nurses that haven't had a smear […] actually one of my friends used to work in colposcopy and she worked there for a year before she ever had a smear done and she was like into her thirties
> **Judy (41):** But she must have been terrified by the end like, she must've been working herself up more and more scared seeing all that stuff […]
> **Laura:** I just can't understand it
>
> (Group 1)

Some attempts at explaining this behaviour were made, however, at the individual level. The participants thought non-screeners either felt anxious about the test results, especially of abnormal test results, and avoided it, because they preferred ignorance if they had such a severe disease as cervical cancer; or, they thought, unscreened women might feel more invincible than they did themselves. The screeners also assumed unscreened women would seek health care only, if they experienced symptoms.

> … most women are are are quite intelligent, but they actually do not take on board stuff that they don't want to deal with at all
>
> (Carla, G2, 49)

> … if your cervix was on your thumb and you could see the os[6], if you could see [a] bit of redness, you'd say 'Oh yeah, must go and get that checked out' but it's so hidden, […] people just forget about it, or bury their head in the sand … (Doris, G3, 45)

Alternatively, the participants attributed non-screeners' behaviour to a lack of health responsibility.

[6] *Os* is the opening of the vagina into the uterus.

> … something that I would come across a bit is this, kind of, over-reliance then on the medical profession to spot everything for you, so patients have this almost unrealistic expectation that if something goes wrong, with them, that it was … the doctor's fault for not picking it up, despite the fact that they didn't actually *go* to the doctor until that particular point in time … (Helen, G4, 26, emphasis in original)

While these accounts constitute attempts at explaining others' behaviour and might lack accuracy in this regard, they are likely to be based on the participants' reasoning about *their* behaviour and highlight what the participants think is important: social support, responsibility, susceptibility, awareness and an understanding of the need for Pap tests. The interaction of social and personal phenomena is apparent in this reasoning.

Summary. Among the participants, personality traits and health beliefs like optimism, general health motivation, desire for control and autonomy and readiness to act appear to create a sense of agency that leads to screening attendance. The extent to which they realise this is evident in their perceptions of unscreened women as lacking responsibility or agency and being more fearful. At the same time the participants felt alternately discouraged by society's supposedly uninformed and stigmatising views as well as *encouraged* by their own social circles and supportive relationships with their smeartakers. Since these participants attend screening, it is possible that they are protected from the discouragement they perceive in society.

Information and Attitude. One of the participants' uses of social support is information provision, but the analysis has shown already that these women preferred reassurance over information and they can be seen to explain their screening uptake as much by knowledge and awareness as by fears and hopes around the Pap test. Dual-process models would explain this observation as a juxtaposition of rational deliberation and experiential, intuitive thinking that creates the participants' attitudes (Epstein, 1994; Kahneman, 2011).

Sources of information. The participants reported various sources of information about the Pap test. The women agreed that they received information from their mothers; their descriptions of interactions with friends around the Pap test suggest that their friends were also sources of information. Although they were aware of its disadvantages, the participants sought information from the internet. Women who

desired women's health information from magazines, however, were unable to find any. They ascribed this to the readership's lack of interest in this topic. Erica (G3, 60) thought "… I'm sure if 'Cervical Smear' was on it, Jesus! You'd run a mile from it". Nevertheless, the women compensated for the lack and inaccuracy of information in the media by seeking advice from medical professionals. They most valued information from their GPs and smear takers and medical communication—for example the NCSP letter. Based on the positive association of regular health care visits and Pap test uptake, as shown in the systematic review, however, non-screeners are less likely to have this opportunity. An effective informational Pap test campaign could thus be crucial.

Most women were aware of the information campaign by the NCSP and realised its importance, but they questioned its effectiveness. The participants perceived the health advertising as very similar to commercial advertising, which they had learned to ignore. The information gained salience for the participants, however, when presented at the Pap test appointment rather than outside the medical context, when other demands on their attention distracted them:

> … I felt at that point, yeah, the GP did outline it very well and I understood myself anyway what it was about […] just being part of the process then, you take it in, you know, whereas otherwise if I had decided 'No, I'm not going to get that done' I probably wouldn't have taken in as much about it … (Grace, G4, 29)

Moreover, they felt that the message was weak and difficult to relate to. The participants criticised the Pap test advertising as impersonal with unsatisfactorily distributed, euphemistic information on an embarrassing subject. Although they disliked objective educational advertising, they also rejected the empathetic tone of information about abnormal Pap tests. They thus expected other women to ignore the advertising or to find it irrelevant as a result.

The women suggested a variety of ways to improve the information campaign. Sarah (G1, 27) and Mary (G1, 27) suggested that other women might pay more attention to these advertisements if they were "depersonalised" and presented more privately online, rather than on regular television:

Sarah (27): Maybe internet-based advertising could be good, you know […] It's just very, eh, it's just yourself in front of a screen as opposed to a whole bunch of people watching TV or listening to the radio

Mary (27): And it depersonalises it, you're not self-conscious that you're watching an add on the internet or on TV or anything

(Group 1)

Note that Mary's (G1, 27) understanding of *depersonalised* deviated from its common meaning which equates to *objectified*. Her comment above clarifies that Mary (G1, 27) actually suggested Internet-based advertising to lessen self-consciousness through unobserved watching. Sarah (G1, 27) and Mary (G1, 27) considered this important, because they expected other women to feel embarrassed by the topic of the advertisements. Their view is similar to the groups' embarrassment over publicly seeking information about the Pap test. In fact, the participants agreed that more personal advertising—typically described in terms of case studies—would be very powerful. This is evident in the discussion of Jade Goody's fate in all focus groups. Grace (G4, 29) and Freda (G4, 60) summarised it well:

Grace (29): … I just remember, like when, Jade Goody […] Everyone kinda knows that story I suppose, in a way, […] I mean it just kinda hit home more about the disease and that like, this is actually something that

Freda (60): Well the fact that somebody could be that young

Grace: Yeah, and can die from it yeah

Freda: And also the fact that you could have […] symptoms and not

Grace: Exactly, not realise

Freda: Be worried enough about them to do anything

Grace: Yeah, so that was information in her case, but it was kind of frightening, you know, to think that that was … her situation, that definitely would […] Have focused my mind on it

(Group 4)

This exchange illustrates how the women saw Jade Goody as a negative role model. She was a vivid reminder to get a Pap test. There is also evidence that her case worked by heightening their fear of cervical cancer and scaring them into action. Carla (G2, 49) said: "when you [Barbara (26)] were saying Jade Goody, now that was scary". Another advantage of this case study was the ease with which the participants could relate to it. The information provided by the case was more interesting and also more difficult to ignore than objectified educational advertising.

Interestingly, the participants appeared to desire three contrasting types of advertisements: public and overt information, advertising relating to personal behaviour and advertising which is accessible more privately. Perhaps a bilateral approach could resolve this dispute by providing private and personal information, and also overt, but more general advertising. While the former might focus on risk behaviours and case studies, the openly visible campaigns can educate about cervical cancer incidence and reasons to have a Pap test, for example.

In addition, the women's empathy for Jade Goody increased the perceived severity of cervical cancer, which benefited the participants, because they knew how to prevent this severe disease. Consequently, content that demonstrates the nature of the disease alongside an emphasis on the Pap test as women's opportunity to prevent it might be very effective.

In accordance with their criticisms of the NCSP campaign, the participants desired further case stories and information about cervical cancer and its symptoms and treatment. Sarah (G1, 27), for instance, explains "I did have 2 abnormal ones, so I was like 'What's gonna happen?' …" Their desire for such information probably related to the reassurance that information gave the women—such as knowing what will happen if they received an abnormal result.

It is worth noting that the participants' suggestions to improve the NCSP information campaign focused mainly on educational health advertising. The participants' generally positive attitude to information explained their focus on educational campaigns. Although they criticised the NCSP campaign, they did believe that information helped them to obtain Pap tests. They gained reassurance from information and felt more optimistic about their reproductive health. These benefits made information valuable to the women. Only Doris (G3, 45) suggested an active strategy to increase Pap test uptake, but the other participants in her group agreed: "I almost […] volunteer to have it done just to show people" (Doris, G3, 45).

While they realised that some accounts of their own Pap test experiences might frighten non-screeners, nobody saw any other negative effects of information.

Perceived and true understanding. Although all of the participants availed of multiple sources of information, their perceived information levels varied. While some women considered themselves to be very informed, others thought they had merely sufficient information, "from a practical point of view, […] to take care of [themselves]" (Carla, G2, 49). The participants varied in their awareness of what knowledge they lacked.

Often this lack related to specific information, such as risk factors or details of the Pap test. All participants knew about the Pap test procedure from prior experience. The participants frequently also knew about the reasons for a Pap test and they all considered the test to be a preventive measure: "… it's like a safety guard" (Doris, G3, 45). Some of them were aware of cervical cancer risk factors, including behavioural risk factors and HPV more specifically. Most women were also aware of the HPV vaccine and mentioned the NCSP and the guidelines set by the programme. Those who were medical professionals also had information about the analysis of the test and the follow-up of abnormal tests.

Some lack of information, however, is evident in the participants' accounts. Few of the women had detailed information about cervical cancer. Information about risk factors was often misunderstood. Note how the dialogue below also illustrates the women's use of interpersonal communication to gather information. This practice occurred in most focus groups.

> **Judy (41):** You know, if you haven't had sex, you don't need to get smears, but -
>
> **Sarah (27):** Really? Not at all? […]
>
> **Laura (36):** Well, they say that, I suppose, the HPV virus has to be there first of all and you don't get that -
>
> **Sarah:** Does it have to be there first of all?
>
> (Group 1)

Especially due to the association with sexual risk behaviour—which is apparent in Judy's (G1, 41) comment—some of the participants misunderstood the Pap test as preventing more than just cervical cancer. Sometimes this coincided with an inaccurate

association of STIs and cervical cancer: "So […] it's a good overall check, in that region …" (Barbara, G2, 26).

There was also a lack of general knowledge about the Pap test in some women. Mary (G1, 27) explains that she "didn't really know, why they do it or how". Others, however, required more specific information—for instance regarding access or the cervical screening guidelines—like Barbara (G2, 26): "I thought it was 2 years actually, not 3" or Laura (G1, 36): "Can you get […] smears done at a family planning clinic?"

Sadly, some women's misinformation led to perhaps unnecessary anxiety, as in the case of Doris (G3, 45) who assumed cervical changes occur at a rate faster than tri-annual Pap tests could detect. To put Doris's (G3, 45) concerns in context, Chapter 2 argued that the literature is unclear on how long cancerous changes take to develop, but presents a range from two to fifty years (Dunleavey, 2009; Miaskowski & Buchsel, 1999). The NCSP is aware of this issue and emphasises that more frequent Pap testing would incur higher spending than the marginal increase in public health benefits can justify (NCSP, 2010). Reassuring information about what followed an abnormal test result was also lacking. More detailed information provision might be a useful measure, with this particular issue, to alleviate women's anxiety.

Most participants perceived themselves as well or sufficiently informed. Despite their good understanding of the practicalities of the Pap test, however, they were actually under-informed about the details. This suggests that detailed information is less important in Pap test attendance than feeling informed. Although improved information provision in these areas might have a reassuring effect, the findings could equally indicate that detailed knowledge about the Pap test is unrelated to these women's inclinations to obtain a Pap test. An alternative motivation for screening uptake might be the women's attitudes.

Attitudes toward the Pap test. All participants agreed about the Pap test's significance for their health**.** They valued it for benefiting their health by preserving their lives and the quality of their lives. Some women, however, questioned its potential. Their concerns contrast the participants' appreciation of the test's benefits, but these women referred primarily to incorrect analyses and fast developing cancers. For instance, Freda (G4, 60) worried that normal Pap test results might install false confidence in some women and others questioned the analytic quality in cytology laboratories. Their anxiety commonly arose from concerns about the remote rather than local analysis of their cell samples, which opposed their preferences. These participants

found local laboratories more trustworthy. As a result, they might have benefited less from their test results.

> I do worry about the ones in Portaloise now […] where they send them off and they weren't done right (Doris, G3, 45)

Furthermore, the pitfalls of optimism and the expectation of normal test results have been explained already; and the delay of the results appeared to detract further from any rewarding effect of the results, by weakening the conditional link of the results to the test.

While some participants were happy with the turn-around time and were unconcerned if they had to wait longer than expected, many others felt that they were waiting too long for their results. They felt that receiving their results sooner would much improve the Pap test experience. Moreover, some women reported to start worrying about their results, *because* they were late and others disapproved of the programme's tardy reaction to abnormal Pap tests.

The participants' strongest negative attitude related to the Pap test procedure, primarily because of its intimacy and unpleasantness. Most women perceived its benefits as compensating for its unpleasantness, though Freda (G4, 60) found the intimacy of the Pap test unjustified; the absence of immediate health needs reduced the benefit of the Pap test, because, she explained, such needs could have directed attention away from the discomfort of the procedure.

> … if you're in labour […] there's an over-riding condition […] distracting you from the fact that you're having something, that intimate or intrusive, whereas you *go* to have *that* test *in the fullness of health*
>
> (Freda, G4, 60, emphasis in original)

In each group at least one participant shared negative experiences of the Pap test and all groups agreed that they disliked the procedure. Some participants argued that a quicker and simpler procedure would make the Pap test less unpleasant, but other women were unable to imagine how to decrease their discomfort. Although many women gratefully acknowledged recent improvements to the screening procedure, the participants felt that further improvements were possible. Yet only the two oldest women reported a preference to avoiding the test:

> … it's fiddly […] And, if it didn't have to be, it would be much, kind of quicker … (Freda, G4, 60)

> … it's just something I prefer not to be doing … (Erica, G3, 60)

Some participants, nevertheless, identified positive aspects of the Pap test procedure. Many women considered the test to be quick and simple already and perceived it as a routine procedure and were comfortable with it. Further, some women stated that the lack of side-effects from the procedure was desirable and that they were thus unable to imagine a concrete alternative to the Pap test. The participants also frequently acknowledged experiencing less discomfort at the Pap test than they had expected: "Jesus that wasn't that bad!" (Sarah, G1, 27).

Attitudes to their smear takers. Earlier sections have outlined the importance of trusting relationships with their smear takers and how they expected smear takers to alleviate the unpleasantness of the Pap test. Four attributes appear necessary for such relationships. Firstly, most of the participants preferred familiar smear takers. They trusted familiar smear takers more easily and therefore felt more confident about the Pap test and their smear takers' level of experience. Most of these participants had regular smear takers and expected or had experienced difficulties due to a change of smear taker.

> … say if the nurse […] that I always go to, […] if it wasn't her again, cause I know now that she is good, so like if I had a new person now, I probably […] would be more apprehensive about it … (Laura, G1, 36)

A minority of women, nevertheless, preferred unfamiliar smear takers. They felt more embarrassed by more familiar smear takers, especially when they also knew them in a social context. One woman even preferred an unknown male smear taker over a familiar female which emphasises her desire for social distance. Kate (G4, 26) explains this disagreement as a balance between trust and embarrassment:

> … it would be handy if it was somebody that you never had to see again, you've never seen before, because that way you'd never really have to think about it, but also, you do want it to be somebody who is reassuring, or somebody that you can kinda trust to do it (Kate, G4, 26)

Although some women had experienced male smear takers, almost all participants preferred female smear takers. It appeared strange to them that men would perform the procedure. Carla (G2, 49) perceived her male doctor as having concerns about performing the test. This suggests the provision of a female smear taker will ease Pap test uptake for most women. Nevertheless, some women might suppress their preference and accept a male smear taker, which will make the test more unpleasant to them.

Thirdly, the women expressed a desire for experienced smear takers. They found experienced smear takers more trustworthy and felt more comfortable during the procedure. In contrast, inexperienced smear takers made them feel anxious and they found the Pap test more unpleasant.

Finally, the participants appreciated smear takers who were attentive to their wishes. Fortunately, many of the participants had such smear takers, but some women reported having been upset by smear takers whom they planned to avoid in future. Many participants perceived nurses as more careful and attentive than doctors, regularly obtained their Pap tests from nurses and preferred them as smear takers. Most participants shared Carla's (G2, 49) desire for sensitive smear takers who calmed and comforted them to make the Pap test less unpleasant. Her active approach to dealing with dissatisfactory smear takers is interesting and provides further evidence for the women's agency.

> … I would be slow enough now to go back to her to be honest with you […] I'd ask for someone else or make sure it was a day she wasn't on …
>
> (Carla, G2, 49)

Most of their smear takers met the sample's desires, resulting in a positive general attitude to smear takers. Note that, those women who had unsatisfactory experiences with their smear takers planned to avoid the *smear takers* in future rather than avoid the Pap test. Their positive general attitude to smear takers might be the basis of their intentions, which were impervious to such negative experiences.

Attitudes to the NCSP. Most participants held positive attitudes to the NCSP, because the programme had increased their level of knowledge and awareness. Some women had also observed an increase in awareness in society. They assumed this was due to the NCSP, role models like Jade Goody and school interventions like HPV vaccination.

They further felt that the NCSP had added regularity and credibility to cervical screening and was persistent in its efforts to entice women to obtain Pap tests. One group concluded the NCSP addressed the inverse care law and made former non-screeners participate, but others desired greater focus on high-risk population and the disadvantaged—though they failed to specify whom they considered to be disadvantaged. Some participants criticised that the NCSP's information campaigns failed to reach, and therefore missed, certain eligible women.

> But I think our message is going to the same people all the time and I don't think it's going to other people at all … (Carla, G2, 49)

The participants found the NCSP easy to deal with and hoped that future generations would also benefit from the programme. In particular, the NCSP's effectiveness satisfied some participants, who assumed that all eligible women received Pap test invitations. In contrast, based on her observation of women being missed by the NCSP, Mary (G1, 27) desired changes to the organisation of the NCSP's register.

The majority of the women who had received NCSP invitations evaluated them positively. They found them helpful and felt comfortable receiving the letter. Some participants disagreed; they reported negative reactions to receiving the invitations, such as negative affect or confusion rather than criticisms of the invitation:

> [The invitation] didn't really explain it all that well it just kind of, well, like, I think it does explain it's just a screening, it's checking for abnormalities and just that it's just something that's normal, you should be doing … (Kate, G4, 26)

Few participants had experience with the reminder letters following up the initial invitation, but Kate (G4, 26) described it as "… pretty much the same, but it was worded slightly more kind of aggressively …"

Only few participants reported satisfaction with the screening guidelines set by the NCSP; and, rather than positively endorsing the guidelines, these women merely agreed that more frequent screening would be too often. Freda (G4, 60) suggested that less frequent Pap tests were justifiable. Since the introduction of the NCSP, Freda (G4, 60) had been at the maximum end of the eligible age range. Although she had had Pap tests throughout her life, she explained that her lack of engagement with the NCSP made it

difficult for her to accept their directions. Her continuously normal Pap results appear to have taught her that Pap tests less frequent than 3 years can be sufficient. Other participants who criticised the NCSP guidelines had quite diverging opinions. Many women desired more frequent Pap tests and most suggested that the NCSP should include women younger than 25 years:

> … I see no reason why it shouldn't be from 17 on, quite an awful lot of girls are sexually active (Carla, G2, 49)

Other participants, however, preferred more flexible guidelines. Rather than screening all women earlier and more often, these participants suggested that the NCSP should emphasise the needs of those at risk:

> … that's a very general thing that they're applying to everybody and there's obviously people at risk […] but then if you are, you gonna have to pay for a screening in between […] every 3 years […] I think it's a very generalisable timeframe … (Barbara, G2, 26)

Furthermore, Freda (G4, 60) found the NCSP's approach too treatment-focused and Barbara (G2, 26) actually found it more difficult to obtain Pap tests after the introduction of the NCSP.

> … up until then I used to get my smears and then, because that system came in, the medical card didn't cover it anymore […] So I had to pay […] if I'd left it [I] would have been anticipatin' 'Aw, I have to remember now, I have to get it done in a few months' time when I turn 25 and I have to register and all this'… (Barbara, G2, 26)

Summary. The participants' reports of generally holding positive attitudes to the Pap test, feeling good about being screened for cervical cancer, feeling comfortable with the test and seeing only advantages to it appear to contradict the negative comments reported in this section. Yet those concerns emerged primarily after probing or thorough contemplation and the women considered their issues to be personal rather than objective criticisms. This suggests that the participants considered their negative attitudes as something that needed *their* efforts to improve rather than the system's.

Although their criticism of the NCSP seem to oppose this idea, these particular issues appeared to affect women in society rather than the participants personally.

Furthermore, although the participants appear to be sufficiently informed to obtain Pap tests, they are, arguably, not well-informed and many of their ambiguous attitudes could be moved by a better understanding of cervical screening. This observation, also means, however, that accurate understanding and deliberate decision-making alone cannot explain Pap test uptake. More subjective opinions, based on their experiences, do appear to have a role to play.

Making screening decisions. This section looks at how the participants described their decision making. The perspectives presented above assume that the participants actively made rational decisions to obtain a Pap test. The participants also considered obtaining a Pap test to be a health achievement that gave them the feeling of taking care of themselves. Freda (G4, 60) and Carla's (G2, 49) comments below show that the participants perceived the reassurance gained from screening to outweigh their psychological barriers to it.

> … it's just momentarily embarrassing to […] have the test done, but, you know that, you're doing it for the right reasons … (Freda, G4, 60)

> … it is uncomfortable for what? 30 seconds? Sure and then it's reassurance for three years like … (Carla, G2, 49)

Freda (G4, 60) also argued, however:

> … if you're in labour or […] something, you know, there's an over-riding condition […] distracting you from the fact that you're having something, that intimate or intrusive, whereas you *go* to have *that* test *in the fullness of health* (Freda, G4, 60, emphasis in original)

This qualification suggests that the women might have tended to explain their behaviour in hindsight as a cost – benefit analysis—they automatically rationalise their Pap test uptake after the fact. Laura (G1, 36) said "… it's not a decision I make …", which indicates that factors other than rational decision-making could have influenced the participants Pap test attendance, such as attitudinal ambivalence and a desire to get the test out of the way or feeling obliged to have the Pap test.

Firstly, their rational decisions might have led them to the conclusion that, eventually, they would have to have a Pap test, and secondly, perceived social pressure might lead to feelings of obligation to receive the test. Instinctively however, they might desire to avoid the test, which is psychologically and physically uncomfortable. These disparate inclinations might create attitudinal ambivalence, which can decrease the influence of intention on their behaviour (Hewstone, Schut, De Wit, Van den Bos, & Stroebe, 2007; Ogden, 2007).

Additional influences, for example, the realisation that their attendance was inevitable, might have allowed them to follow their rational intentions: "it was just another thing done, out of the way" (Doris, G3, 45).

Alternatively, the perceived inevitability of the test might create a feeling of obligation to have it. All focus groups provided evidence for this conclusion:

> … I don't go 'Will I go for it or won't I go for it?' it's like, 'I have to go for it' (Laura, G1, 36)

> … it's like washing teeth as far as I'm concerned you wash them, not because you like washing them, but you're preventing … (Carla, G2, 49)

This argument is further evidence for the applicability of dual-process theory in this context.

Concluding remarks

Overall, this study suggests that many predictors discovered in previous research apply to the Irish screening context. In accordance with Forss et al. (2001) and Waller Jackowska, and colleagues (2012), the findings provide support for three well-researched theories: HBM, TPB and the dual-process theories (see Chapter 4). The intra-personal influences explained here match those identified in the systematic review very well. While it is unclear whether the balancing of barriers and benefits in making screening decisions occurred prior to attendance or in hindsight, the findings show that readiness to act and cues to action were relevant concepts. Similarly, attitude, subjective norms and intention, as stipulated by TPB, could be found in the participants' accounts. Support for the idea of PBC might be found in the participants' confidence in their practical knowledge of the Pap test. Dual-process models might help to explain why the participants reported both making decisions and not making decisions about screening.

Their unexpectedly ambiguous attitudes are also better understood from this perspective: only after probing and deliberation did the disadvantages of screening become apparent to them; intuitively their attitudes were positive.

In previous Irish research (Bowe, 2004) attitudes appeared to play as important a role as in this study. Similar psychological barriers emerged from that research (Bowe, 2004) and also in the systematic review. Meanwhile, the problem of smear taker availability appears to have lessened: where Bowe's interviewees desired more choice, our participants had smear takers with whom they were comfortable. This might vary by geographic region, however, as Bowe's participants included rural women and mine benefited from the Cork City infrastructure.

The analysis supports the argument in the systematic review that screened women were interested in their health and would also engage in other healthy behaviours. They also provided practical examples of the association of HLoC with screening attendance that was found in the systematic review. Reassurance of their health was very important to the participants. Maintenance of their health and control over it was the primary benefit of the Pap test and they were willing to put up with discomfort during the procedure to have this reassurance. Interestingly, their optimistic expectations to have normal results decreased the effect of this benefit, in addition to decreased effect due to temporal delays, similar to Blomberg, Widmark and colleagues' (2011) findings. This process demonstrates that, although various viewpoints were presented in different sections of the analysis, they are connected and impact as a whole.

In reaction to the lack of a beneficial effect the participants suggested material rewards. This is in line with the review findings of Shekelle et al. (1999) and Stone and colleagues (2002). Conversely, Bowe's (2004) participants felt incentivised by the cost-free provision of Pap tests, which relates to my participants' appreciation of the same. In contrast to Blomberg, Tishelman, et al. (2011), no-one thought charging a fee would add value to the Pap test.

The analysis showed that social influences from close friends and family had an important effect on the participants' Pap test attendance, while the lack of support from society seemed to have less of an impact. This might go some way towards explaining the lacking support for lay health worker interventions from meta-analyses. Like case studies in the media, family and friends are much more relatable than the general public, which include lay health workers.

The participants reported several sources of fear, such as fear of the test procedure, fear of pain during the procedure, fear of abnormal results and fear of cervical cancer and disease in general. The latter was conducive to Pap test uptake and feeds into susceptibility and severity. Mirroring the review findings, there was some ambiguity in the participants' reports of susceptibility. Readiness to action could be most conducive to disease prevention, when sufficient knowledge about ways to reduce susceptibility or severity is available, as explained by Fylan (1998). Following Yabroff et al.'s (2005) argument, women might be more willing to engage in early cancer detection if they believe that the possibility of an abnormal finding is low or only moderate.

The participants demonstrated an interesting relationship with information. The participants felt that cervical screening was a topic unsuited to public discussion; and they argued that they ignored the current screening advertisements, because they were presented in an unrelated context. Media coverage of cervical screening could hold their attention, however, with relatable case studies.

Furthermore, although many women felt that they had an adequate understanding of cervical screening, their most accurate knowledge was practical and likely to originate in their experiences of having attended for Pap tests. Theoretical knowledge—about cervical cancer and its risk factors, for example—was often lacking or misunderstood. Women who felt less informed possibly realised that they were lacking this theoretical knowledge, whereas participants who reported good understanding might have been unaware that they were lacking accurate theoretical knowledge.

These findings challenge the emphasis of previous research on increased information provision (Ackerson & Gretebeck, 2007; Ackerson & Preston, 2009; Akers, Newmann, & Smith, 2007; Austin, Ahmad, McNally, & Stewart, 2002; Bingham et al., 2003; Coughlin & Wilson, 2002; Edwards et al., 2008; Fylan, 1998; Lee-Lin & Menon, 2005; Loerzel & Bushy, 2005; Walsh, 2006). Instead basic information about why to have the Pap test, details of the procedure and where to get it appears to suffice women to obtain a Pap test, which might confirm Fylan's argument that perceived knowledge is more influential. In general the participants were highly health literate, however, which is unsurprising as several worked in health care and a self-selected sample for a study as this one can be expected to show some appreciation for health issues. This fits also with the review finding that screened women are more likely to be better informed about health.

Some participants would also agree with the review that disadvantaged populations are not reached by screening programmes and they demanded more educational campaigns to increase screening attendance, for themselves and others. They suggested a combination of personally relevant information that is privately accessible and overt public education campaigns about cervical cancer incidence and the benefits of the Pap test; this approach would make the Pap test an appropriate public topic.

This contradiction between their apparent needs and desires could be explained by the reassurance the participants gained from information. This is the sort of information they sought and wanted disseminated. They further thought reassuring information was best combined with persuasive strategies to increase screening attendance—which is interesting, because this idea mirrors the methods employed by the commercial advertising that the participants found easiest to ignore. More importantly, it opposes the current emphasis on informed decision-making in public health and denies self-determination, the loss of which the participants had criticised, to the audience of this one-sided advertising. Yet, given their lack of theoretical knowledge, it is questionable whether the participants were sufficiently informed to justify their preference for this strategy. The participants might prefer information that encourages attendance also because it reassures them that they are doing the right thing already. This argument shows how information might lead to mis-informed decision-making.

However, the evidence of informed decision-making about screening attendance appears to vary (Blomberg et al., 2008; Forss et al., 2001; Waller, Jackowska et al., 2012) and similar to Forss and colleagues' our sample contained passive attenders. Though all of the participants were able to give reasons for their screening attendance, some reported they attended for Pap tests automatically.

Forss and co-authors' (2001) argument that different forms of knowledge lead to screening decisions must be considered also, and our participants' use of social connections rather than the NCSP information campaign to gather screening information is supportive evidence. Alternative reason for their Pap test attendance could be to reduce stress from attitudinal ambivalence—the women said they were happy after they had had their Pap test, so they could then stop thinking about it—or feelings of obligation—they perceived the test as prescribed rather than offered.

A sentiment similar to my participants' loss of self-determination emerged in Blomberg, and co-authors' (2008) study of Swedish women who chose not to participate in organised cervical screening. Their participants also argued that the

intimacy of the Pap test required a trusting relationship with their smear taker, and so they preferred to pay their familiar gynaecologist to perform the test over attending a pre-booked appointment within the Swedish screening programme. They felt controlled by the screening programme and "described a contradiction between the explicit voluntary nature of [the programme] and a feeling of an implicit coercion to participate." (Blomberg et al., 2008, p. 565). Their views and criticisms were more detailed than those of my participants, but Blomberg and colleagues also find this difference in comparison with Swedish programme participants.

Limitations. Unfortunately the design of this study emphasises rational decision-making as a cause of behaviour. Asking women about their views of the Pap test after they have attended for it might lead them to rationalise their behaviour and present views that accord with their actions. Introductory textbooks present the circular relationship of attitudes and behaviour as well-established (Hogg & Vaughan, 2008; Myers, 2008). Additionally, it is in the nature of non-conscious drives to be difficult to report.

One may also question to what extent any of these conclusions are true for unscreened and irregularly screened women, because the analysis focused on data from women who obtain Pap tests. Blomberg, Tishelman, and colleagues (2011) argue, however, that there is value in focusing on aspects that facilitate screening, as reported by screened women. They might point to uptake interventions from a salutogenic perspective.

Furthermore, Waller, Jackowska, and collaborators (2012) report similar barriers among unscreened women as the participants mentioned in this study and these barriers match well with those identified in the systematic review. Screened women, however, appear to overcome these barriers (Blomberg et al., 2008), which begs the question what prevents unscreened women from doing the same. In Waller, Jackowska, and colleagues' study unscreened women seemed to perceive less necessity to overcome their barriers due to low perceived risk. Arguably, unscreened women might actively decide not to attend cervical screening (Blomberg et al., 2008; Waller, Jackowska, et al., 2012) and, thus, might have no need to overcome any barriers.

Open questions. The reluctance of unscreened women to participate in this study is interesting in its own right. Screened women find cervical screening to be an unpopular topic in public conversation, but the tendency to avoid such conversation might be particularly pronounced in non-attendees. Alternatively, I imagine irregular and non-

screeners might be unwilling to identify themselves as such, due to social desirability effects. A survey study could be sufficiently anonymous to establish how far the present findings apply to these groups.

In addition, a sample of 13 must fail to provide generalisable information even to regularly screening women. Although the findings frequently agree with those of the systematic review, some differences did emerge. The review found that male smear takers would prevent women from attending, but the focus group participants would accept the increased awkwardness of a male smear taker to obtain their Pap test. The sample also appears to disagree with the review and previous qualitative research (Blomberg, Tishelman et al., 2011) about the value of pre-arranged screening appointments. Moreover, the issue of decision-making is important, practically and conceptually, but no relevant reviews were identified. Thus, the conclusions about decision-making in this chapter warrant further examination. A cross-sectional survey can investigate the generalisability of the findings in a broader sample.

Chapter 6

Irish opinions of cervical cancer screening

~ Study 3 ~

In Chapter 5 a complex set of influences appeared to affect screening attendance. The focus groups provided a better understanding of how these influences might interact in the particular case of the interviewees. Building on this evidence, the present study surveys women in Ireland to investigate whether a similar picture emerges on a larger scale, and to answer the first research question introduced in Chapter 1:

> What predicts the uptake of cervical screening following the introduction of the NCSP in Ireland?

As outlined in the introduction Walsh and colleagues' (2003) research found a regression model of anticipated regret, attitude, subjective norms and perceived behavioural control to predicted 41% of the variance in intention, while intention was the only significant predictor in a logistic regression of screening attendance (Walsh, 2005). In Walsh and colleagues' (2010) study socio-demographics predicted women's screening behaviours. Women who were married, reported higher socio-economic status or education, good health, and those aged 30 to 59 years were more likely to have attended for cervical screening in the past 12 months.

The focus groups suggested that these influences still play a role, but in addition to influences like information levels, general health motivation, or personality. This study examines a population similar to Walsh's (2003, 2005, 2006; Walsh, O'Reilly, & Tracey, 2003) sample 5 years after the nationwide introduction of the NCSP and investigates the predictors of screening intentions and regular attendance. This study tests the hypotheses that:

a) screening intention will be predicted by a combination of individual differences, demographics, health risk variables, health care resources, screening information level, and health behaviour constructs; and
b) regular screening attendances will be predicted by a combination of individual differences, demographics, health risk variables, health care resources, screening information level, and health behaviour constructs.

Methodology

Research design. Cross-sectional designs can achieve these goals and are widely used in social sciences research to establish relationships between variables. They are particularly suitable to collect data on behaviour that is difficult to observe directly, such as behaviour related to sexual health (Robson, 2002; Whitley, 2002); but their primary strength is their ability to assess many variables at once (Robson, 2002; Whitley, 2002). This design fits the realist perspective well and is suitable for research with practical relevance (Breakwell, Hammond, Fife-Shaw, & Smith, 2006; Marsh, 1982; Robson, 2002).

Cross-sectional surveys are, however, unable to establish causal links (de Vaus, 2001) and Marsh (1982) criticises the temptation to explain survey findings *post hoc*. As surveys are limited to describing relationships between data; it is the responsibility of the researcher to explain the relationships found. Alternatively to hindsight, which is unreliable, Marsh, and Robson (2002), argue for cross-sectional research to rely on theory as a guide to what are meaningful relationships to investigate among the variables. Used in this manner cross-sectional designs can strengthen and elaborate on existing theories (Marsh, 1982). Cross-sectional designs are further valuable for theory building, because they can identify predictors that fail to correlate with the outcome variable and are therefore not a cause of the outcome variable, an ability just as valuable as the demonstration of causality (de Vaus, 2001).

This survey relied on self-report data gathered by an online questionnaire. Whitley (2002) explains that self-report measures can suffer from inaccuracy, as the respondents have to rely on their memory, which is reconstructive; and he argues that since the respondents often might be unaware of what influences their behaviour, they are unable to report these influences correctly (Nisbett & Wilson, 1977 as cited in Whitley, 2002). Questions about actual and recent events, rather than hypothetical situations, can overcome this issue.

Further, social desirability biases can arise when the respondents feel they are being evaluated when they complete the questionnaire. They are then likely to under-report socially undesirable and sensitive behaviours and to over-report socially desirable behaviours (Breakwell et al., 2006). This bias threatens the generalisability of questionnaire data (Schuman & Presser, 1981). Whitley (2002) suggests that the questionnaire items should use non-judgemental phrasing. The wording of instructions and questionnaire items can establish some level of rapport even in self-administered questionnaires.

In addition, Ogden (2003) argues that in the process of answering questionnaire items the participants might re-consider the issue, i.e. responding to the questionnaire might change the participants' intentions or subsequent behaviour. A review by French and Sutton (2010) corroborates Ogden's argument. To avoid this problem, intention was measured at the beginning of the questionnaire.

In a similar manner early items on a questionnaire can influence responses to subsequent items on the questionnaire (Ogden, 2003; Schuman & Presser, 1981). Therefore the questionnaire items were arranged such that items which potentially informed the participants' responses to other items were presented first. For example, items examining the participants' information levels about cervical cancer risk factors were presented before items that established whether these risk factors were present. The items measuring perceived threat came before those items that might make the participants aware of their actual level of risk. Distributing the questionnaire online ensured that all questions were answered in the intended order: items that respondents should answer subsequently to others were presented on a new page.

According to Schuman and Presser (1981) items with similar content are particularly prone to order effects and should appear at different points of the questionnaire. Coherent appearance of the questionnaire, however, requires similar items to appear together. Partial randomisation of the item order might be a good compromise here, though Schuman and Presser warn of the additional order effects that this might introduce. In this study participants had to answer some questions following others: changing the order of the early questions means the context of later questions changes for different participants. Schuman and Presser describe research showing that variations in the context of the questions can affect the participants' responses to it. Thus, while partial randomisation might improve the generalisability of the study, it compromises the validity of the findings in the first instance.

The inclusion of a *don't know* or *no opinion* option among the response options for a question exposes this study to the non-attitude problem. Their research leads Schuman and Presser (1981, p. 160) to conclude that "... whether filtered [including *no opinion* options] or standard questions should be used in a questionnaire would seem to depend on whether an investigator is interested mainly in 'informed opinion' [*sic*] on an issue or mainly in underlying dispositions." In this study the response options of the original scales usually predetermined the provision of *don't know* options. Additional *don't know* options were provided where participants reported past events—e.g. Have *you ever had a Pap test? Yes; No; I don't know*—and for the items assessing the participants' level of information. None of these scales assessed opinion-based matters: participants who selected *I don't know* on the information level scales were simply scored as if they had answered the item incorrectly. In the case of past events the *I don't know* options were treated like incomplete responses and the participants were excluded from the analysis. While this might result in a significant decrease in sample size, discouraging a *don't know* response could lead participants to "make up their responses on the spot" (Breakwell et al., 2006, p. 217) and give badly considered answers. Such responses are unlikely to predict behaviour at all.

Questionnaire distribution. The questionnaire was distributed online, but recruitment used online and offline channels to advertise for participants. According to Whitley (2002) online surveying is advantageous because of its low cost and the many ways in which the technology can save time and aid data collection. It eases data entry considerably, for instance. Online survey formats allow some degree of interaction with the participants, despite the absence of a researcher. Thus, the form can remind participants to respond to items they have missed, it can redirect them to relevant questions depending on their answers to previous items and, although the participants are unable to ask for clarification, the form can provide further information where their need was anticipated. The absence of a researcher might also decrease social desirability bias. Online administration enables the respondents to participate wherever and whenever they choose and increases the pool of potential convenience samples beyond university students. Online questionnaires are therefore suitable to discussing sensitive topics and produce data of good internal validity.

Whitley (2002) and Breakwell et al. (2006), however, point out the main caveats of online distribution. While the internet might offer a larger population to draw an ad hoc sample, this method excludes people without access to the internet or, potentially, with

low literacy skills. Convenience to the participants means decreased control over the environment in which the data are collected. Mean attrition rates of 34% have been observed in online surveys; however, carefully designed and piloted online questionnaires will eliminate and anticipate difficulties in responding (Musch & Reips, 2000). While an internet sample will provide less generalisable data than a random sample, it is very similar to convenience samples of university students, on whom a considerable number of psychological studies depend (Krantz & Dalal, 2000 as cited in Whitley, 2002). Overall, Whitley concludes that the benefits of the online survey method outweigh its disadvantages.

Sample size and sampling. The adequacy of the sample's size depends on the desired power of the statistical analyses used, the level of reliability desired and the anticipated effect size of the relationship under investigation; however, the values of these parameters depend on another (Field, 2009; Whitley, 2002). According to Whitley the power of any test ought to be larger than .5, which equals the probability of guesswork, but Cohen (1988 as cited in Field, 2009; 1992 as cited in Whitley, 2002) demands statistical power larger than .8. Table 6.1 shows the a priori power analysis with G*Power for multiple regression for both power thresholds and different effect sizes, given a model of 20 predictors.

Table 6.1

A Priori Power Analysis for Linear Multiple Regression

	Total N required	
Effect sizes	Power: $1-\beta = 0.5$	$1-\beta = 0.8$
small ($f^2 = 0.02$)	629	1064
moderate ($f^2 = 0.15$)	99	157
large ($f^2 = 0.35$)	53	77

Note. Analysis for up to 20 predictors at $\alpha = .05$.

Similarly, Field (2009) shows that a sample of 200 participants should detect large and moderate effects in a model with up to 20 predictor variables at $1-\beta = .8$. Whitely corroborates this by demonstrating that with a sample size of N = 200 a test should have a statistical power of $1-\beta = .9$ for large and moderate effects. Nevertheless, as much as 83% of studies miss small effects (Rossi, 1990 as cited in Whitley, 2002) and a sample size of N = 400 was necessary to detect small effects at $1-\beta = .8$ according to

Field. Table 6.1 suggests that even larger samples sizes of over 1000 participants would be required.

Taking a realist perspective Robson (2002) argues that large effect sizes should be the primary focus, as they provide certainty that a significant effect is robust, rather than an artefact of large sample size. In addition, this study seeks to identify predictors of regular attendance and intention that are amenable to intervention. If this intervention should have any practical relevance, the effects examined in this study ought to be moderate to large in size. Therefore, a sample size of N = 200 can be considered adequate.

While the method of distribution allows for data collection to continue until a sufficient number of participants have responded, in combination with convenience sampling, non-response and attrition create challenges around the sample's representativeness. Convenience sampling is highly accessible and cost efficient and, therefore, commonly used (Robson, 2002; Whitley, 2002). Nevertheless, the literature cautions against its use, because convenience samples fail to represent the target population reliably (Breakwell et al., 2006; de Vaus, 2001; Robson, 2002; Whitley, 2002). Moser and Kalton (1971, p. 80) explain that "randomness lies at the base of all sound sampling designs..." They argue that non-probability samples introduce biases which even large sample sizes are unable to counter-act. Robson suggests, however, that in what he calls "real world research" (p. 3) random samples, if possible, are difficult to achieve and "… the argument has to follow different lines. Even if statistical generalisation is not legitimate, it may be feasible to use the kind of theoretical generalisations [allowed by] flexible research [methods]…" (p. 267). While the validity of convenience sampling remains controversial (Whitley, 2002), Robson goes so far as to say that since almost all research relied on convenience sampling, almost all statistical inference in social science was questionable.

In order to combat the problems associated with non-response and convenience sampling, Robson (2002) suggests an investigation into the differences of responders and non-responders. Comparisons of the sample to those who began, but failed to complete the questionnaire, and those who were excluded might provide some insight. The effect sizes of the relationships found will also indicate to what extent sample size might have influenced the findings.

Method

Participants. Like the focus groups, this survey examined Irish-born and -raised women aged between 25 and 60 years. The inclusion criteria are explained in Chapter 5.

Participants were recruited through the staff and student emailing lists of the university, advertisements on internet forums such as Facebook or boards.ie and posters sent to places of public interest across the Republic of Ireland, e.g. libraries and post offices. In this manner 252 participants were recruited.

Materials. The study relied on a comprehensive questionnaire assessing personality traits, demographics, health risk behaviours, health care resources, information levels, and health behaviour theories. The findings of the systematic review and focus group findings informed the selection of variables to include in the questionnaire. The inclusion criteria for participation controlled for cultural influences, therefore the survey excluded measures of ethnicity and acculturation.

Scales were selected from previous research based on their cultural applicability to the present sample, the reported reliability coefficient and the length of the scale.

The questionnaire was piloted by four women who had lived outside Ireland for more than 12 months and were ineligible to participate but who fulfilled all other inclusion criteria. The NCSP and the Ethics Committee of the School of Applied Psychology also commented on the questionnaire. These reviewers suggested rewording some items and amendments to some response options. The NCSP also made some suggestions to include further items. These suggestions were realised where the items were unconstrained by psychometric concerns. The questionnaire is found in Appendix D (pp. D – 2).

In addition, a poster was prepared to advertise the study and recruit participants. The poster explained the topic of the study and type of participants sought. It also provided a short URL that interested women could tear off the bottom of the poster. It is presented in Appendix D (p. D – 20). An explanatory letter asking the recipient to display the poster and advertise the study accompanied the poster (cf. Appendix D, p. D – 21).

Variables. The questionnaire benefits from pre-existing scales where reliability and validity measures have been provided by previous research. The literature discourages alterations to pre-existing scales or item wording, as this may change the scale validity and scores would lose their comparability to previous uses of the scale (Breakwell et al., 2006). It is, however, bad practise to administer items that are unfamiliar or irrelevant to

the participants. The use of scales that have been validated for the population which a particular study investigates can solve this dilemma (Breakwell et al., 2006) Nevertheless, this approach would have left the present study with very few scales or items to use. In very few cases item wording was adapted and a minority of scales was altered by deleting irrelevant items and adding any that the focus groups or other previous research identified as essential. Table 6.2 in Appendix D (pp. D – 22) shows the details of the scales used in this questionnaire, including reliability coefficients for this study. Any changes made to these scales are discussed below.

Individual differences. Differences that might impact intention or uptake regularity included: personality, impulsivity, HLoC and spirituality. Rammstedt and John (2007) provide a short version of the Big Five personality questionnaire. Their questionnaire consists of two items per dimension which are measured on a five-point Likert-scale. Reliability coefficients for each dimension and for the entire questionnaire are compared to those for the present sample in table 6.2 (Appendix D, p. D – 27). Impulsivity was measured using Eysenck and Eysenck's (1978) scale of 13 items with yes – no response options, which were summed. A three-dimensional scale for HLoC was used, which examined internal locus, external chance locus and external powerful other locus with six items each on a six-point Likert-scale (Wallston & Wallston, 1978; Wallston, Wallston, Kaplan, & Maides, 1976; Wallston, Wallston, & De Vellis, 1978). The reliability coefficients are available in Appendix D (p. D – 27). These standardised scales were used without changes.

Surveys that investigated the relationship of spirituality and cervical screening attendance (Hoyo et al., 2005; Menon, Szalacha, & Prabhughate, 2012; Reiter & Linnan, 2011; Seow, Huang, & Straughan, 2000), however, appear to conflate fatalism—which is similar to chance HLoC—religion, and spirituality. To keep the questionnaire concise one item from Bruce's (2000) spirituality assessment among public administrators was included: *I consider myself a spiritual person,* on a five-point Likert-scale to gain some more detailed information than Bruce's dichotomised response options would have provided.

Demographics. Age, education, occupation, socio-economic and marital status were included. Women's SES can prove problematic to assess, because some women rely on their spouses' income whereas others contribute to a shared family income or live off their own incomes (Breakwell et al., 2006). For some women income might present a sensitive issue and it is common practice to provide income bands from which to choose (Breakwell et al., 2006). In this survey SES was assessed as the primary wage

earner's occupation categorised into socio-economic groups in accordance with the Central Statistics Office (CSO, 2007), which accommodated all of these situations. The participants' occupation was assessed with one item adapted from Walsh et al. (2003), who supply eight response options. This questionnaire adds *retired* and *other*, which were possible but missing in Walsh et al. The item was equally discreet as the SES item, indicating earnings only indirectly.

Marital status was assessed with a frequently used item providing six response options: *married, cohabiting, separated/ divorced, widowed, single, other, not specified* (Arrossi, Ramos, Paolino, & Sankaranarayanan, 2008; Ji, Chen, Sun, & Liang, 2010; Murray & McMillan, 1993; Reiter & Linnan, 2011; Savage & Clarke, 2001; Sheinfeld Gorin & Heck, 2005; Somkin et al., 2004; Sung, Alema-Mensah, & Blumenthal, 2002; Wang, Fang, Yin, Liu, & Ma, 2010a). In keeping with the practices of the CSO (2002), women in a stable relationship who were not cohabiting were categorised as *single*. Cohabiting women, however, share a household with their partner and are in many ways similar to married women, especially non-heterosexual women in relationships can be assessed this way.

Health risk variables. This section of the survey included parity, perceived health status and sexual risk taking. Many of these items were of a sensitive nature and there is a danger of higher attrition if participants feel they must respond to these questions (Breakwell et al., 2006). The introduction to this section in particular attempted to increase rapport, reminded of anonymity and confidentiality, but also emphasised that these questions may be skipped. Throughout the survey, only the items that assessed outcome variables and exclusion criteria were compulsory items to answer. If participants skipped any other item, they were reminded that the item had been missed, but that they could leave it blank if they so desired. This was hoped to decrease attrition due to sensitivity.

Sexual risk behaviour encompassed seven single items (cf. table 6.2, Appendix D, pp. D – 26). Bourne, Charles, Francis, South-Bourne, and Peters' (2010) *Are you and your partner currently using contraception?* was a dichotomous item that the authors followed up by a more detailed question about the method of contraception used, such as *condoms, the pill,* or *an intrauterine device*. By combining these response options with *no contraception* and *not currently sexually active,* the present questionnaire could do with one less question.

The item asking for the participants' age at their first sexual intercourse (AFI) was adapted from Lazcano-Ponce and co-authors (2002). Their open-ended response option

had to be amended to provide four categories: *15-19 years; 20-24 years; older than 24 years;* and *never had intercourse*. Sexual intercourse with under-17-year-olds is illegal in Ireland and would lead the participants to disclose criminal behaviour. The category *15-19 years* can still signify the risk of early onset of sexual intercourse for cervical cancer, but all participants in this category might have had their first intercourse when they were older than 17 years. *Never had intercourse* was added in response to a pilot participant suggesting that this might apply to a minority of women.

Health care resources. This section enquired about enabling circumstances related to health care. These included having a regular source of care, a positive relationship to one's doctor, preference for the smear taker's sex, satisfaction with one's smear taker, social support in health care matters and having health insurance.

In accordance with Swan, Breen, Coates, Rimer, and Lee (2003) four response options were provided to record access to a regular source of care: *a GP or clinic, the A & E department, none, other*. Responses are dichotomised at data entry into having a regular source of care and being without a regular source of care, whereby the latter included *the A & E department*.

The health insurance item derived from (NCSP, 2012). The item asked the participants to choose any that apply from *private health insurance, medical card*[7]*, GP visit card* and *no health insurance*. The pilot participants suggested that some respondents might have more than one form of health coverage. Since the item was dichotomised as receiving reimbursement for health care costs versus not receiving reimbursement, the participants could select more than one.

Information levels. Knowledge was assessed for cervical cancer, the Pap test and cervical cancer risk factors. While the measurement of information levels in questionnaires is straightforward, it is uncertain who answered the items and whether any help was sought in answering them (Breakwell et al., 2006). This survey was unable to control for seeking help in answering the knowledge items, but the introduction to these items explained to participants that these questions, rather than evaluate, simply sought to "find out in what areas women need to be informed better." (cf. Appendix D, pp. D – 2).

[7] The medical card is issued by the Health Service Executive (HSE) to residents in Ireland with an income below the HSE's guidelines or experiencing financial hardship due to ongoing medical cost caused by a chronic illness. The medical card entitles the card holder to free or cost-reduced primary and hospital care, prescriptions, dental and other health services (HSE, 2013).

Self-reported cervical cancer knowledge was assessed as one item with dichotomous response options: *I do not know enough about cervical cancer to make decisions about its prevention.* This item was adapted from Hoyo et al.'s (2005, p. 442) "Do not know enough about cervical cancer to bother getting screened." With this item it was particularly important to avoid providing information which might help answering the other knowledge items on this page of the questionnaire. The new item loses the association of the Pap test screening with cervical cancer prevention, to which the participants might refer when answering subsequent knowledge questions about the Pap test or cervical cancer risk factors. Since validity and reliability are not assessed for a dichotomous one-item scale, it was a priority to avoid confounding.

Pap test knowledge was assessed as the sum of correct answers to nine items taken from Leung and Leung (2010), Eaker, Adami, and Sparén (2001) and NCSP (2012). Risk factor knowledge was assessed, similarly, as the sum of correct answers to 15 items collated from Leung and Leung and Ralston et al. (2003). Both scales are multiple choice questionnaires whereby the analyst assessed the answers as correct or incorrect. Validity and reliability measures are therefore irrelevant in this instance. The combination of items might render the knowledge level of the present sample incomparable to those of previous samples; but the combination allows for assessing all aspects of Pap test and risk factor knowledge and thus identifies important gaps in women's information levels, e.g. how often they should get a Pap test, who should get a Pap test, etc.

Health behaviour theories. The survey assessed the components of HBM and TPB. Additional theoretical items were general health motivation, anticipated regret, patient invitation, perceived moral obligation to obtain a Pap test, unrealistic optimism, fear of cervical cancer, and perceived stigma.

Self-efficacy emerged from the discussion of EVTs as an important concept in explaining health behaviours; the systematic review failed to identify synthesised evidence on the concept's utility, however, and while the focus groups demonstrated the importance of control constructs, the participants described a general desire to be in control (HLoC) and feeling capable of obtaining a Pap test (PBC) rather than self-efficacy. Moreover, both scales which have measured self-efficacy in relation to Pap test uptake (Hogenmiller, 2007; Tung et al., 2010b) principally inform about the salience of specific screening barriers already assessed by a measure of perceived barriers (Hill & Gick, 2011).

Although intentions are easily accessed in a questionnaire, it is useful to specify an appropriate time frame in which women might perform the intended behaviour (Breakwell et al., 2006). Walsh et al. (2003) and Bish and colleagues (2000) used a 3-month interval, the participants in this study, however, were due a Pap test at different intervals ranging from immediately to in 5 years' time. To keep questions relevant to all participants, the questions were framed in relation to their next Pap test invitation: *when invited next*. This makes sense, because the NCSP sends screening invitations to women who are due a Pap test.

The assessment of behaviour in a questionnaire can be problematic, as such items assume accurate memory and might be influenced by social desirability biases (Breakwell et al., 2006). To deal with the first issue, questions asking about past behaviour always provided a *don't know* option. The second concern was managed by establishing rapport with the participants in the introductory note and the page description at the top of each new page. The purpose of the study was explained as a survey of opinions of cervical screening, which was hoped to de-emphasise the participants' actual behaviour (cf. Appendix D, pp. D – 2).

Despite lacking consensus over how best to measure attitude and opinions, multiple-item scales are commonly used with five- or seven-point Likert-scales as response options (Breakwell et al., 2006). This questionnaire is largely bound to the formats provided by previously-used scales. Many of these used Likert-type formats, but attitude was measured on four seven-point semantic differential scales (Sandberg & Conner, 2009).

The item assessing exposure to cervical cancer required particular attention. Hislop et al. (2003) asked their participants if they had close friends or relatives with a cancer history. They fail to provide any further details on the item, but based on this information the item *Do you have close friends or relatives with a cancer history?* was included in the questionnaire. The response options *yes, with cervical cancer; yes, with another type of cancer;* and *no* were given to assess the degree of specificity of the participants' experiences. This one-item scale relies on categorical responses, such that reliability and validity are irrelevant.

The scale for perceived benefits was compiled from selected items from Allahverdipour and Emami (2008) and Kahn, Goodman, Huang, Slap, and Emans (2003). This is because the focus group findings suggested it would be useful to supplement Kahn et al.'s easily understood items with three from Allahverdipour and

Emami, the topics of which were missing in Kahn's items: *When I do a Pap test, I feel good about myself; When I have regular Pap tests, I don't worry as much about cervical cancer;* and *Having a regular Pap test will allow me to feel healthy and relaxed for the future.* Scores were computed as the mean of seven items on a five-point scale as in Allahverdipour and Emami, because Kahn and colleagues fail to provide information about reliability and response options. Table 6.2 (Appendix D, pp. D – 23) shows that the combined scale used in this study achieved greater reliability than Allahverdipour and Emami's items alone.

In addition, cues to action were adapted from Hennig and Knowles (1990), who assessed the items on an ordinal scale from least to most important; this was converted into a nominal scale: *has occurred; has not occurred;* and *not applicable* for non-screeners and into a six-point scale for screened women. A *not applicable* option was provided along with the Likert-scale. At the suggestion of the NCSP an item about their Pap test invitations as a cue to action was added.

Weinstein (1984) developed the concept of unrealistic optimism, measured on a one-item scale. The item can be altered to suit any topic of interest and any comparison group. Thus, to measure unrealistic optimism about the development of cervical cancer the item was changed to: *Compared to other women, my chances of having cervical cancer in the future are*…. A seven-point scale provided the response options.

The perceived stigma of sexual behaviour has been assessed primarily among communities that consider pre-marital sexual intercourse socially unacceptable, focusing on the stigmatisation of young unmarried women who have Pap tests (Byrd, Peterson, Chavez, & Heckert, 2004; Tung et al., 2010b). The focus groups found that the Pap test might be perceived as stigmatising in relation to sexual behaviour among Irish women also; the stigma differs in its content, however. The focus of the item used by Byrd et al. and Tung et al. was changed from pre-marital sexual intercourse to sexual risk behaviour in general: *If a woman gets a Pap test, everyone will think she engages in sexually risky behaviour.* The four-point scale provided in both studies (Byrd et al., 2004; Tung et al., 2010b) remained unchanged.

Procedure. Interested women were invited to follow a link to an online version of the questionnaire. The cover page informed them about the study topic and explained confidentiality, anonymity and voluntary participation. The page required the women to give their informed consent before it could redirect to the first survey page, which assessed eligibility criteria. Ineligible women were redirected to a page that explained

why they had been excluded from the survey; eligible women were redirected to the first questionnaire page.

Depending on their level of experience with cervical screening, the website displayed only questions to the participants that were relevant to them. For example, unscreened women skipped the question whether they would recommend their smear taker to friends and family.

When the participants had passed through all survey pages, screened participants were provided with details of whom to contact regarding the study or in case of distress. Then these participants were redirected to the Thank-you page.

Statistical analysis. The analysis initially established the characteristics of the sample and compared complete cases to partial and excluded cases. Subsequently predictive models of screening intentions and uptake regularity in those who completed the survey were tested. SPSS and G*Power were used to perform the analyses.

Multiple and logistic regression models investigated the predictors of intention and uptake regularity. The regression analyses used the hierarchical method to control for difficult-to-modify predictors, and proceeded in seven steps: firstly the outcome variables were regressed on the individual differences predictors. In the second step socio-demographic predictors were added to the model; and risk factors were added in the third step. This created a model containing all significant personal characteristics that predicted intention or uptake regularity. The fourth, fifth and sixth step occurred in parallel, whereby health care resources, informational and EVT predictors, respectively, were entered. The seventh step combined the predictors that emerged as significant in the previous three steps and resulted in the final model.

To identify variables to enter into regression analyses the bivariate relationships of intention and uptake regularity with the predictor variables were examined. As a conservative cut-off, all variables that emerged as significant at $p \leq .10$ were entered into the regression models.

Moderation and mediation analyses were conducted using SPSS in accordance with Hayes (2013). Ordinary least squares regression was used to examine interaction effects of possible moderators identified by the regression models. The mediation analysis examined covariates of intention and its predictors that emerged during multiple regression. This procedure used ordinary least squares path analysis as described by Hayes.

Results

Figure 6.2 summarise the recruitment of participants, including exclusion and attrition. Of 688 women attempting the survey, 304 had to be excluded: seven women could not consent to taking part and 11 men attempted the survey. One woman was older than 60 years and 59 women were younger than 25 years. In addition, 114 women had lived outside Ireland for more than 12 months and another 101 women were born outside Ireland. Eleven women had had a hysterectomy. Of the remaining 384 participants 256 completed and submitted the questionnaire. Thus, the completion rate is 66.67%. Four women had to be excluded, however, because they were unsure whether they had ever had a Pap test. A sample size of N = 252 is sufficient to detect moderate to large effects at a significance level of $\alpha = .05$ at a power of .8 (Field, 2009).

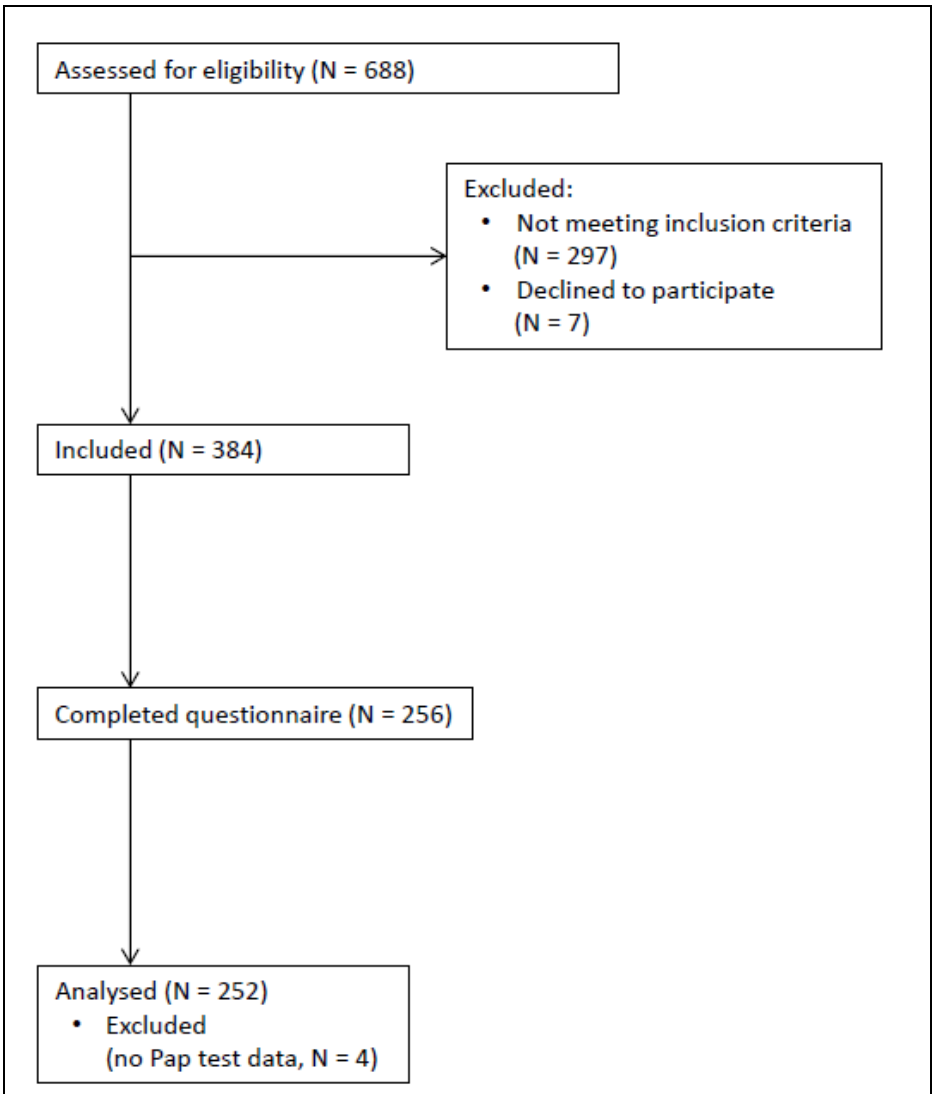

Figure 6.2. Participant recruitment

Sample analysis. Prior to the inferential tests this section will investigate the characteristics of those participants who completed the study and examine differences in those characteristics between the total sample and those who left the survey early or had to be excluded.

Screening status. The majority of the participants (94.05%) had had a Pap test at least once in their lives. Of 237 screened women, 220 had a recent Pap test, 12 women were irregular screeners (Chapter 5 defined these different uptake patterns) and five screeners had failed to give information when they had last had a Pap test. Fifteen women were unscreened. Eighty-seven screened women had previously had an abnormal Pap test result.

Demographics. Please refer to table 6.3 in Appendix D (pp. D – 28) for detailed demographic information. The participants were aged 25 to 60 years, with most aged between 25 and 44 years (mean = 36.23 [SD = 8.52]). Almost half of the participants were married and women in long-term relationships (cohabiting or married) constituted over two thirds of the sample. The sample displayed a high level of education with 56.35% holding at least an honours Bachelor's degree. Just over 40% described themselves as working in a professional or managerial position and 61.90% belonged to the three highest socio-economic groups. Nevertheless, half of the sample reported concern over household finances. Due to the low frequency of some occupational and socio-economic groups, both variables were collapsed for further analysis as shown in table 6.3

Compared to the most recent census in 2011 (CSO, 2012), this sample was younger with less third-level education than the general population of women in this age range, although in the sample twice the rate of women held doctorates. The sample had more women in the higher occupational and socio-economic status groups. Students were over-represented by over 20%. Fewer participants were married, separated, widowed or single than in the census; however, the census did not record cohabitation and this may account for the imbalance.

Personality. Table 6.4 shows the means, medians and normality tests for the variables measuring individual differences. All of the K-S tests were significant meaning that all of the individual difference indicators were non-normally distributed.

Table 6.4

Distribution of Individual Difference Variables

	Mean (SD)	Median	Normality[a]
Personality: BFI			
Openness to experience (N = 250)	6.74 (1.78)	7	.14*
Conscientiousness (N = 251)	7.97 (1.65)	8	.15*
Extraversion(N = 249)	6.66 (1.73)	7	.14*
Agreeableness (N = 250)	7.38 (1.68)	8	.17*
Neuroticism (N = 251)	5.85 (1.79)	6	.16*
Spirituality (N = 251)	3.17 (1.08)	3	.23*
HLoC			
Internal (N= 247)	24.22 (3.67)	24	.08*
External (chance, N = 248)	16.94 (4.14)	17	.07*
External (powerful others, N = 249)	15.73 (4.36)	15	.09*
Impulsivity (N = 247)	17.44 (3.09)	17	.13*

Note. [a] Kolmogorov-Smirnov (K-S) test of normality; * $p \leq .01$.

With the scores on the BFI ranging from 2 to 10 the sample achieved high mean scores on conscientiousness and agreeableness and achieved the lowest mean score on neuroticism, which was, however, well in the centre of the range. As a whole the sample reported moderate spirituality: the mean and median converge on the centre score of the response scale. With a possible range of scores from 13 to 25, the sample scored low on the impulsivity scale. The scores on the HLoC scales had a possible range from 6 to 36. The sample scored higher on the internal HLoC sub-scale than on the two external HLoC sub-scales. The sample means are within the range of those found for female samples of a similar mean age (range: 30.28 years to 33.74 years, Wallston & Wallston, 1981).

Health risk behaviours. For the continuous variables the K-S test showed that all of these variables were non-normally distributed (cf. table 6.5). The sample's self-reported health was good. The medians for both physical and mental health were above the mid-point of the scales.

Table 6.5

Distribution of Health Risk Behaviours—Continuous Variables

	Mean (SD)	Median	Normality[a]
Perceived physical health (N = 252)	17.41 (2.50)	18.00	.24*
Perceived mental health (N = 248)	20.01 (3.55)	21.00	.13*
Number of life-time sexual partners (N = 242)	5.65 (6.74)	4.00	.24*
Number of new partners in past 6 months (N = 231)	0.36 (0.60)	0.00	.42*

Note. [a] K-S test; * $p \leq .01$

The mean and median were particularly far apart for the number of life-time sexual partners for which the three highest scores might be responsible (40, 50, 51). The general tendency was towards much fewer partners and two participants reported never to have had sexual intercourse. The sample tended to have had no new sexual partners within the 6 months prior to the survey; the high proportion of women in long-term relationships might explain this.

Table 6.6 shows the score distribution for the categorical health risk variables. The contraceptive pill and condoms were most frequently reported, but the avoidance of contraception was almost as frequent with one-third of those reporting non-use currently being sexually inactive. Two participants had never had intercourse. Over 50 percent of the participants had had their first sexual intercourse between the ages of 15 and 19 years and over 30 percent between 20 and 24 years.

Table 6.6

Distribution of Health Risk Behaviours—Categorical Variables

	Frequency	Percentage
Contraception (N = 251)		
Condoms	38	15.08
Contraceptive pill	75	29.76
IUD[a]	23	9.13
Other	14	5.56
None	69	27.38

Table 6.6

Distribution of Health Risk Behaviours—Categorical Variables

	Frequency	Percentage
Not currently sexually active	32	12.70
Taking care of children <12 years (N = 252)		
Yes	98	38.89
No	154	61.11
Ever been pregnant (N = 252)		
Yes	147	58.33
No	105	41.67
AFI (N = 248)		
15-19 years	135	53.57
20-24 years	93	36.91
25 years and older	18	7.14
Never had intercourse	2	0.80
Any genital symptoms in past 5 years (N = 251)		
Yes	24	9.52
No	227	90.08
Ever had an STI (N = 251)		
Yes	19	7.54
No	232	92.06
Ever diagnosed with HPV (N = 251)		
Yes	16	6.34
No	235	93.25

Note. [a]Intrauterine device.

While more than half of the sample reported to have been pregnant, only 39% were currently taking care of children younger than 12 years—even though the sample was relatively young with 82% of the sample aged between 25 and 44 years, and a mean age of 36 years.

Few participants reported genital symptoms or STIs. Less than 10% had experienced any genital symptoms in the past 5 years, 7.50% reported to have had an STI and even

fewer reported ever having been diagnosed with HPV. The low frequency of STIs is noteworthy given the high level of contraception avoidance in the sample; however, the high proportion of long-term relationships and low number of new sexual partners in the past 6 months might explain both findings.

Information levels. Understanding of the Pap test varied between scores of 4 and 12, which was the highest score possible. The mean and median, however, approached the mid-point of the scale suggesting an even, albeit non-normal distribution.

The variation in risk information levels was even greater. The minimum score achieved was nil items correct and the maximum was 13 out of 15. Scores between 2 and 13 can be expected (cf. table 6.7). Risk information levels were also non-normally distributed. Table 6.8 shows the percentage of women who answered each information level item correctly. Fewer than half the sample knew how an inflammation with HPV can be treated, or that having sex at a young age, multiparity, taking the contraceptive pill, and having sex without a condom are risk factors for cervical cancer, but that being over 50 years old, having a history of STI or being post-menopausal were not risk factors.

Table 6.7

Distribution of Information Levels

	Mean (SD)	Median	Normality[a]
Information level (Pap test, N = 246)	7.44 (1.41)	7.00	.15*
Information level (risk factors, N = 242)	7.50 (2.62)	8.00	.12*

Note. [a] K-S test; * p ≤ .01

Table 6.8

Frequency of Correct Answers to Pap Test and Risk Factor Knowledge Items

Items	% correct
Information level (Pap test)	
I'm too old to need cervical screening.	98.02
Cervical screening is not necessary once women have reached menopause.	78.57
Healthy women need to have regular cervical screening.	94.05
Women should have cervical screening soon after the first	51.39

Table 6.8

Frequency of Correct Answers to Pap Test and Risk Factor Knowledge Items

Items	% correct
experience of sex.	
If I hadn't sex for ages, I wouldn't need cervical screening.	95.24
Once you have a normal Pap test result, there is no need to go for more Pap tests.	98.02
I only had one sexual partner, so there's no need to have cervical screening.	98.81
Do you know when you should go for your next Pap test?	73.79
How can an inflammation of the cervix be treated?	35.45
Information level (risk factors)	
being over 50 years	38.52
having sex at an early age	47.60
having multiple sexual partners	58.06
having sexual activity with a man who has had multiple sexual partners	50.60
having frequent sexual activity with the same man	63.60
having a history of sexually transmitted disease	16.40
having several miscarriages	50.40
giving birth to many children	10.80
lack of Pap test screening	79.37
having or having had an infection with Human Papillomavirus	76.19
smoking	63.49
post-menopause	33.33
taking the pill	26.98
having had a previous abnormal Pap smear	88.40
having sex without a condom	42.40

Note.

Information level about cervical cancer was a dichotomous variable. Of the 251 participants who answered the question 127 (50.40%) felt insufficiently informed about cervical cancer to make decisions about its prevention—124 (49.21%) felt informed.

Health care resources. Table 6.9 shows that almost the entire sample felt they had someone close to talk to about health care matters like cervical cancer. Most of the sample also had a regular source of care and 86% reported receiving some form of reimbursement for health care expenses. Most women who had had a Pap test would recommend their smear taker to family and friends, which suggests a high level of satisfaction. Just over 73% preferred a female smear taker; the remaining participants had no preference. No-one reported a preference for a male smear taker.

Table 6.9

Distribution of Health Care Resources

	Frequency	Percentage
Social support (N = 249)		
Yes	231	91.67
No	18	7.14
Insurance (N = 252)[a]		
Yes	217	86.11
No	35	13.89
Regular source of care (N = 252)		
Yes	241	95.64
No	11	4.37
Quality of their smear taker (N = 237)[b]		
Satisfied	216	91.14
Not satisfied	21	8.86
Preferred sex of smear taker (N = 251)		
Female	184	73.02
Male	0	0.00
Either	67	26.59

Note. [a] forms of health insurance included GP visit card, medical card and/or private health insurance, [b] item was not presented to non-screeners.

Doctor – patient relationship was the only continuous variable in this section. The mean score is 27.84 (SD = 3.81, N = 251) compared to a median of 28. With a possible range from 8 to 32, the central tendencies agree on a high frequency of positive doctor – patient relationships in the sample, which corresponds to sample means reported by Somkin et al. (2004). Nevertheless, the K-S test was significant at $p \leq .01$ (K-S = .14), indicating a non-normal distribution.

Health behaviour theories. Table 6.10 summarises the central tendencies and K-S tests for the continuous theory-based variables. The variation in intention is low, as indicated by the small standard deviation and the central tendency toward the maximum. Accordingly, the K-S test is significant indicating non-normal distribution.

Table 6.10

Distribution of Continuous Psychological Variables

	Mean (SD)	Median	Normality[a]
Intention (N = 252)	4.68 (0.85)	5.00	.49*
Health Belief Model			
Perceived susceptibility (N = 251)	4.01 (1.02)	4.00	.22*
Perceived severity(N = 251)	5.39 (0.84)	5.00	.25*
Perceived barriers (N = 247)	2.45 (1.05)	2.29	.09*
Perceived benefits (N = 251)	3.99 (0.68)	4.00	.07*
Theory of Planned Behaviour			
Attitudes (N = 249)	2.56 (0.90)	3.00	.41*
Subjective norms (N = 249)	9.28 (1.68)	10.00	.45*
PBC (N = 250)	3.79 (0.56)	4.00	.50*
Additional variables			
Moral obligation (N = 252)	4.14 (1.29)	5.00	.33*
Anticipated regret (N = 225)	10.80 (3.61)	11.00	.12*
Unrealistic optimism (N = 252)	0.02 (1.03)	0.00	.34*
General health motivation (N = 252)	11.31 (2.18)	12.00	.20*
Risk stigma (N = 251)	1.13 (0.51)	1.00	.53*

Note. [a] K-S test; * $p \leq .01$.

The predictors of HBM were also all non-normally distributed. The scores for perceived susceptibility could range from 2 to 10, so a mean and median score of 4 indicates low perceived susceptibility to cervical cancer in this sample. Nevertheless, the participants tended to consider cervical cancer to be a "quite serious" disease. The mean and median of perceived barriers both indicated that the barriers to cervical screening in the sample were low. The scores could range from 1 to 7. Perceived benefits on the other hand were high with a mean and median close to the maximum score of 5.

The variables of TPB were also non-normally distributed. With a possible range from -3 (negative) to +3 (positive) the mean and median attitude scores indicate very favourable attitudes toward cervical screening. Very strong subjective norms are suggested by the mean and median reaching the maximum (10) of the scale. Perceived behavioural control was high in the sample: the median score converges with the scale maximum (4) and the mean approaches it.

Moral obligation scores also tended toward the scale maximum (5) with the mean at 4.14 and a median of 5.00. The level of anticipated regret, however, varied across the sample. The mean and median just exceeded the mid-point of the scale. The mean and median for unrealistic optimism also converged with the mid-point of the scale. This indicates that the participants estimated their chances of developing cervical cancer realistically. Overall, the sample reported high general health motivation with the scores tending towards the highest quartile of the possible range from 2 to 14. The participants found the Pap test to be free from the stigma of engaging in sexual risk behaviour: the mean and median converged at the minimum of the scale (1) with only a small standard deviation from the mean.

Similarly, most participants disagreed with the item stating that lacking hygiene could cause cervical cancer, as shown in table 6.11. Most of the sample had vicarious experiences of cancer through affected family members or friends, but just 7.50% knew someone with cervical cancer and almost two thirds of the participants reported to be unafraid of cervical cancer. Approximately 36% agreed, however, that they thought about developing cervical cancer. The majority of the women recalled having been invited for a Pap test previously and most of these women recalled invitations from the NCSP. The second most commonly recalled invitations came from their GPs.

Table 6.11

Distribution of Categorical Psychological Variables

	Frequency	Percentage
Hygiene stigma (N = 251)		
Agree	3	1.19
Disagree	219	86.91
I don't know	29	11.51
Exposure to cancer (N = 252)		
Yes, to cervical cancer	19	7.54
Yes, to another cancer	192	76.19
No	41	16.27
Invited for a Pap test (N = 251)		
Ever	217	86.11
Never	34	13.49
Invited by (N = 209)[a]		
NCSP	179	82.49
GP	20	9.22
A clinic/ hospital	3	1.38
NCSP & GP	6	2.76
NCSP & GP & a clinic/ hospital	1	0.46

Note. [a]item only presented to participants who answered *yes* to *Have you ever been invited for a Pap test?*

Cues to action in screened and unscreened participants. Table 6.12 shows that in keeping with the frequent recall of NCSP invitations, these were the most potent cues to action for screened women. Reminders from health care professionals were also important cues, whereas public and magazine advertisements were least important.

Table 6.12

Distribution of Cues in Screened Women

	Mean (SD)	Median	Normality[a]
My doctor reminds me (N = 232)	5.09 (1.48)	6	.27*
Someone close to me reminds me (N = 231)	4.26 (2.13)	4	.13*
Seeing a reminder advertisement in a public place (N = 232)	3.77 (1.92)	4	.12*
Seeing a reminder advertisement in a magazine or newspaper (N = 232)	3.69 (1.96)	4	.12*
Receiving an invitation letter from the NCSP (N = 236)	5.73 (0.88)	6	.47*
If somebody I knew discovered she had cervical cancer (N = 232)	4.95 (1.50)	5	.22*
Seeing my own reminder in a diary or calendar (N = 232)	4.84 (1.79)	6	.26*

Note. [a] K-S test; * $p \leq .01$.

In contrast, 60% of the unscreened women recalled being reminded to have a Pap test by health care professionals or important others (see table 6.13) and as many recalled seeing public advertisements. Just over a quarter recalled cervical screening advertisements in magazines or newspapers. Almost half of the sample were unable to recall receiving invitations letters from the NCSP. Eighty percent reported knowing no-one who had discovered cervical cancer, or having reminded themselves.

Table 6.13

Distribution of Cues in Unscreened Women

	Frequency	Percentage
Has a doctor or health professional ever recommended that you have a Pap test?		
Yes	9	60.00
No	6	40.00

Table 6.13

Distribution of Cues in Unscreened Women

	Frequency	Percentage
Has a person important to you ever reminded you?		
Yes	9	60.00
No	6	40.00
Have you ever seen a Pap test reminder advertisement in a public place?		
Yes	9	60.00
No	6	40.00
Have you ever seen a Pap test reminder in a magazine or newspaper?		
Yes	4	26.67
No	11	73.33
Have you ever received a Pap test invitation from the NCSP?		
Yes	8	53.33
No	7	46.67
Has anyone you know ever discovered that she has cervical cancer?		
Yes	3	20.00
No	12	80.00
Have you ever reminded yourself in a diary or calendar?		
Yes	3	20.00
No	12	80.00

Note. N = 15.

Excluded, partial and complete cases. Data are available for some excluded women enabling comparison of excluded, incomplete and included cases. Table 6.14 (Appendix D, pp. D – 30) summarises the analyses of variance of differences between partial and excluded cases compared to complete cases. The parametric tests discovered the same significant findings as the non-parametric Kruskal-Wallis tests. Significant group differences were found in subjective norm, perceived barriers, attitude, perceived mental health and neuroticism.

As shown in table 6.15, Tukey's test was used for post hoc tests to compare complete cases to partial and excluded cases. Using the Bonferroni correction reduced

the α-level to $p \leq .05/2 = .03$. For neuroticism the t-test was used to compare complete to excluded cases, because only one incomplete case had a neuroticism score. The comparison of neuroticism in excluded women (mean = 5.43) and women in the sample (mean = 5.85) found no significant difference: $t(318) = 1.75$, $p = .08$.

Table 6.15

Post Hoc Tests of Difference of Complete, Partial and Excluded Cases

	Mean difference	SE	p
Subjective norm			
Complete vs partial	0.33	0.44	.74
Complete vs excluded	0.82	0.26	.04[-1]
Perceived barriers			
Complete vs partial	-0.89	0.20	.02[-2]
Complete vs excluded	-0.32	0.15	.09
Attitude			
Complete vs partial	0.59	0.24	.04
Complete vs excluded	0.13	0.13	.55
Perceived mental health			
Complete vs partial	4.01	1.60	.03
Complete vs excluded	-0.70	1.64	.32

Note.

Women who completed the survey reported significantly stronger subjective norms to attend than the excluded women. Women who completed the survey also reported significantly fewer barriers to attendance and stronger positive attitude toward the Pap test than women who left the study prematurely. Differences between the groups in mental health failed to reach significance even at $p \leq .03$. As the comparison of complete and partial cases shows the lower p-value, women who left the survey early reported significantly worse mental health than women who completed the survey.

The chi-square analyses in table 6.16 (Appendix D, pp. D – 34) show that the three groups also differed significantly in their age, level of education, SES, having had a Pap test, uptake regularity, previous abnormal test results and the quality of their smear taker. Standardised residuals were used as post hoc tests to identify significant

differences. Naturally, the disqualified women were the only group containing women younger than 25 years or older than 60 years, but women who completed the survey were most likely to be aged 25 to 44 years—excluded women were least likely to be aged 25 to 44 years. Excluded women were also most likely to have a doctoral degree and least likely to hold advanced or higher certificates. SES data were missing for women who left the survey early, but excluded women were significantly less likely to be non-manual or manual labourers than women included in the sample. The analyses of uptake regularity showed that women who completed the survey were least likely never to have had a Pap test or be unsure whether they had had the test. Women who left the survey early were most likely to report previous abnormal Pap test results. Both excluded women and those who left the survey early were more likely to report that they would not recommend their smear taker to their family or friends. Cell counts of less than five may compromise the chi-square analyses and it is, therefore, difficult to ascertain whether these differences truly exist or emerged due to empty groups in the analysis.

These analyses show that women in the sample were most likely to have been screened. The study excluded women of higher SES, with slightly better mental health and lower subjective norms to have a Pap test. Of the included women, those who completed the study were more likely to be satisfied with their smear taker, reported more positive attitude and fewer barriers, and they were less likely ever to have had an abnormal Pap test. This suggests that positive Pap test experiences might be associated with greater likelihood of completing the questionnaire.

Multiple regression of intention. Prior to multiple regression the relationships between intention and the predictor variables were examined. Table 6.17a shows the significant correlations of intention with the continuous variables; table 6.17b in Appendix D (p. D – 41) show the non-significant correlations. Moral obligation, anticipated regret, perceived benefit, positive attitude, general health motivation, conscientiousness, agreeableness, and extraversion predicted strong intention; while perceived barriers and stigma of sexual risk behaviour predicted weak intention. The Pearson and Spearman correlations disagreed about the significance of the correlations with subjective norms, impulsivity, and PBC. As all of the variables involved in these correlations are non-normally distributed, the more conservative Spearman's ϱ was used.

Table 6.17a

Significant Correlations with Intention

Predictor	r	ρ	N
Moral obligation	.23***	.32***	252
Anticipated regret	.21**	.22***	225
Perceived barriers	-.23***	-.24***	247
Stigma of sexual risk behaviour	-.15*	-.21***	251
Perceived benefits	.21***	.22***	251
Attitudes	.46***	.44***	247
General health motivation	.15**	.21***	252
Conscientiousness	.11*	.15**	251
Agreeableness	.11*	.12*	250
Extraversion	.14**	.12*	249
Subjective norm	.11*	.10	249
Impulsivity	.11*	.04	247
PBC	.09	.14**	250

Note. *approaching sig. at p≤.10; ** p ≤ .05; *** p ≤ .01.

Table 6.18a shows the results of the non-parametric independent-samples tests; the non-significant results can be seen in table 6.18b (Appendix D, pp. D – 41). T-tests were carried out for comparison; however, the results frequently differed from the non-parametric test results and the non-normal data frequently violated the assumption of equal variances. The non-parametric findings are therefore of greater importance. Health insurance and satisfaction with her smear taker predicted stronger intentions to obtain a Pap test. Only screened women could answer this item, however, and its inclusion in the regression model would exclude unscreened women from the analysis, so this variable was withheld from the regression model.

Table 6.18a

Significant Analysis of Dichotomous Predictors of Intention

	N	Median	Mean Rank		Effect size
Mann-Whitney				U (z)	(r)
Health insurance				3328.00* (-1.87)	-.12
Yes	217	5.00	128.66		
No	35	5.00	113.09		
Kolmogorov-Smirnov				Z	
Quality of the smear taker[a]				1.44**	-.09
Satisfied	216	5.00			
Not satisfied	21	5.00			
Previous Pap test				1.25***	.08
Yes	237	5.00			
No	15	5.00			

Note. [a] question answered by screened women only; *p ≤ .10; **p ≤ .05; *** p ≤ .01.

Table 6.19a shows that of the categorical variables AFI and uptake regularity emerged as significantly related to intention. The findings of Kruskal-Wallis and ANOVA concurred for all 11 tests, so the more powerful ANOVAs are reported. Post hoc analyses were carried out for the significant ANOVAs using Tukey's test. To avoid type I errors the Bonferroni correction was used. As p = .05/3 = .017, the α-level for each test was set at p ≤ .02. Table 6.19b in Appendix D (pp. D – 42) shows the non-significant Analyses of Variance.

Table 6.19a

Significant Analyses of Variance in Differences in Intention

	Mean	F (df_M, df_R)	Effect size (ω^2)
Uptake regularity (N = 247)		17.20 (2, 244)***	.12
regular (N = 220)	4.78		
irregular (N = 12)	3.83		
unscreened (N = 15)	3.80		

Table 6.19a

Significant Analyses of Variance in Differences in Intention

	Mean	F (df_M, df_R)	Effect size (ω^2)
AFI(N = 248)		2.47 (3, 244)*	.02
15-19 years (N =135)	4.73		
20-24 years (N =93)	4.70		
25 years + (N = 18)	4.33		
Never had intercourse (N = 2)	3.50		

Note. *p ≤ .10, ** p ≤ .05; *** p ≤ .01.

The post hoc analyses found that regular screeners reported significantly stronger intention than irregular screeners and non-screeners; but found no significant differences between irregular and unscreened women (see table 6.20). Table 6.20 further shows the post-hoc tests for AFI with four categories. The modal score for AFI is *15-19 years*. Therefore, post-hoc analysis compared all other categories against this group. Three post-hoc tests were carried out initially, so the new significance level was p ≤ .02. The comparison of *15-19 years* and *never had intercourse* had the smallest p-value, but just two participants were in the latter category.

Table 6.20

Post Hoc Comparisons for Significant ANOVAs

	Mean Difference	SE	p
Uptake regularity[a]			
Regular vs irregular	.95	.24	$.03^{-2}$
Regular vs unscreened	.98	.22	$.03^{-3}$
Irregular vs unscreened	.03	.31	.99
AFI[a]			
15-19 years vs 20-24 years	.03	.12	.99
15-19 years vs 25 years+	.40	.21	.24
15-19 years vs never had intercourse	1.23	.61	.18
AFI (merged)[b]			
15-19 years vs 20-24 years	.03	.12	.95

Table 6.20

Post Hoc Comparisons for Significant ANOVAs

	Mean Difference	SE	p
15-19 years vs 25 years+	.48	.20	.05

Note. [a] $p \leq .02$; [b] $p \leq .03$.

As they were both older than 24 years, these cases were added to the group of those 25 years and older at first intercourse. Additional post hoc tests were carried out to compare the original and merged categories. The Bonferroni-corrected α-level was $p \leq .05/2 \leq .025$. Intention was not significantly different when sexual initiation occurred from age 20 to 24 years compared to those who commenced intercourse between the ages of 15 and 19 years. Those who were older than 24 years at their first sexual intercourse, however, were significantly less likely to intend to have a Pap test than those who were 15 to 19 years old at first intercourse.

Hierarchical regression was used for further analysis. In the first step individual differences predictors were entered. Table 6.21 summarises the model. The model based on individual differences predicts intention better than the mean ($p \leq .05$). R^2 indicates that the model predicts 4.48% of the variance in intention ($p \leq .05$). In the subsequent regression models conscientiousness, extraversion and agreeableness constituted Step 1, in accordance with their Spearman correlations significant at $p \leq .10$.

Table 6.21

Step 1: Multiple Regression of Individual Differences

Predictor	B	SE	β	Part correlation
Constant	3.51	0.38		
Conscientiousness	0.05	0.04	.11	.10
Extraversion	0.07	0.03	.13	.13
Agreeableness	0.04	0.04	.08	.08

Note. N = 210; $R^2 = .05$, F = 3.22 ($p \leq .05$)

Since demographic variables and intention were unrelated bivariately, the next step examined risk factors. According to Ralston et al. (2003) avoidance of cervical screening is a risk factor for developing cervical cancer. Thus, it is appropriate to enter previous Pap test and uptake regularity in Step 2, together with AFI.

This regression required dummy variables for AFI and uptake regularity. Similar to the post-hoc tests, the third and fourth categories of AFI were merged and three dummy variables produced for each predictor. Regression of the dummies, as displayed in table 6.22, showed that only *25 years +* produced a significant model parameter. As the only dummy variable with a significant β-value, *25 years+* was included in Step 2 as AFI. The dummy regression for uptake regularity is shown in table 6.22: irregular screeners were significantly less likely to intend to have a Pap test than others, as were non-screeners compared to other. The latter had the lowest p-value and the largest part correlation and could be entered into the regression; however, this dummy duplicates the previous Pap test variable, which was used instead.

Table 6.22

Regression of Dummy Variables for AFI and Uptake Regularity

Predictor	B	SE	β	Part correlation
AFI				
Constant	3.76	0.53		
20-24 years vs other	0.02	0.13	.01	0.01
25 years + vs other	0.45	0.23	.14*	0.14
Excluded				
15-19 years				
Uptake regularity				
Constant	0.71	0.67		
Irregular vs other	0.97	0.25	.25**	0.25
Unscreened vs other	1.07	0.22	.31**	0.31
Excluded				
Regular vs other				

Note. N =210; R^2 = 0.02, F = 1.99 for AFI; R^2 = 0.15, F = 17.90 for uptake regularity; *p≤.05, **p≤.001.

Table 6.23 presents Step 2 of the regression. The inclusion of AFI and previous Pap test improved the model significantly, though it explained only 1.71% of the variance in intention after Step 2. The F-ratio increased significantly, which suggests an improvement in the model's predictive ability. Previous Pap test explained 7.24% of the

variance in Intention. Women who had ever had Pap test reported stronger intentions than non-screeners.

Table 6.23

Step 2: Multiple Regression of Risk Factors

Predictor	B	SE	β	Part Correlation
Constant	4.05	0.61		
Conscientiousness	0.05	0.04	.09	.09
Extraversion	0.04	0.03	.09	.08
Agreeableness	0.05	0.03	.09	.09
Previous Pap Test	-0.95	.23	-.27*	-.27
AFI	0.33	0.22	.10	.10

Note. N = 210; R^2 = .13, ΔR^2 = .09 (p ≤ .001), F = 6.13 (p ≤ .001); * p ≤ .001

Step 1 and Step 2 investigated predictors that might affect intention, but are less amenable to intervention. To investigate modifiable predictors, resource variables were entered in Step 3a. Table 6.24 summarises the model.

Table 6.24

Step 3a: Multiple Regression of Resources

Predictor	B	SE	β	Part Correlation
Constant	4.48	0.62		
Conscientiousness	0.05	0.04	.09	.09
Extraversion	0.04	0.03	.08	.08
Agreeableness	0.04	0.03	.08	.07
Previous Pap Test	-0.98	0.23	-.28**	-.28
AFI	0.40	0.22	.12	.12
Health insurance	-0.39	0.16	-.16*	-.16

Note. N = 210; R^2 = .16, ΔR^2 = .13 (p ≤ .05), F = 6.24 (p ≤ .001); * p ≤ .05; ** p ≤ .001

The model improved significantly through the addition of health insurance. Women who were reimbursed for their health care costs and those who had ever had a Pap test reported significantly stronger intentions. Health insurance predicted 2.52% of the variance in intention, while previous Pap test predicted 7.67%. Overall, in Step 3a the

model predicted 1.69% more variance, but the inclusion of health insurance significantly increased the F-ratio, meaning the improved fit compensated well for the additional error.

None of the information level variables correlated with intention, so only one parallel analysis was conducted entering EVT variables in Step 3b. Table 6.25 shows the regression model.

Table 6.25

Step 3b: Multiple Regression of EVT Variables

Predictor	B	SE	β	Part Correlation
Constant	3.26	.78		
Conscientiousness	0.01	.03	.02	.02
Extraversion	0.02	.03	.04	.04
Agreeableness	0.03	.03	.05	.05
Previous Pap test	-0.69	.22	-.20*	-.19
AFI	0.13	.20	.04	.04
Moral obligation	0.08	.05	.12	.11
Anticipated regret	-0.03	.02	-.02	-.01
Perceived barriers	0.06	.06	.08	.06
Risk stigma	-0.16	.11	-.09	-.08
Perceived benefits	0.09	.09	.07	.06
Attitude	0.35	.07	.38*	.29
PBC	-0.06	.09	-.04	-.04
General health motivation	0.02	.03	.04	.04

Note. N = 210; R^2 = .32, ΔR^2 = .19 ($p \leq .001$), F= 6.97 ($p \leq .001$); *$p \leq .01$

Model fit improved considerably after Step 3b. The F-ratio suggests that the model's accuracy also increased. The predictive power of the model also improved significantly as shown in table 6.25: the EVT regression model predicts almost 10% of the variance in intention. Women with more positive attitude and those who had ever had a Pap test reported significantly stronger intentions. Attitude explained 8.47% of the variance and previous Pap test explained 3.42%.

In the final iteration of the analysis the variables in Step 1 and Step 2 were entered into the regression as before. Step 3 combined health insurance and attitude. Table 6.26 shows the final model.

Table 6.26

Step 3: Multiple Regression—Final Model

Predictor	B	SE	β	Part Correlation
Constant	3.85	0.58		
Conscientiousness	0.03	0.03	.05	.05
Extraversion	0.01	0.03	.03	.03
Agreeableness	0.02	0.03	.05	.04
AFI	0.23	0.20	.07	.07
Previous Pap Test	-0.68	0.21	-.20**	-.19
Health Insurance	-0.29	0.14	-.12*	-.12
Attitude	0.38	0.06	.41***	.38

Note. N = 210; R^2 = .30, ΔR^2 = .17 ($p \leq .001$), F = 12.54 ($p \leq .001$); *p ≤ .01, **p ≤ .001.

The final model performs worse than the EVT model: while the inclusion of previous Pap test, health insurance and attitude significantly increased the variance explained to 9.18%, the new model explains less of the variance than when only the EVT variables and controls were included. Nevertheless, the new model has a more favourable error-prediction balance than the EVT model: model fit in relation to error significantly improved from Step 2 to Step 3. In addition, all three predictor variables emerged with significant β-values in the final model. Previous Pap test explained 3.61%, health insurance explained 2.43% and attitude explained the most variance in intention with 9.99%. Table 6.27 displays all steps of the model.

Table 6.27

Step 3: Multiple regression—Final Model Complete

Predictor	B	SE	β	Part correlation	Tolerance	VIF
Step 1						
Constant	3.51	0.38				
Conscientiousness	0.05	0.04	.11	.10	.92	1.09
Extraversion	0.07	0.03	.13	.13	.97	1.03
Agreeableness	0.04	0.04	.08	.08	.94	1.07
Step 2						
Constant	4.05	0.61				
Conscientiousness	0.05	0.04	.09	.09	.91	1.10
Extraversion	0.04	0.03	.09	.08	.94	1.06
Agreeableness	0.05	0.03	.09	.09	.92	1.08
AFI	0.33	0.22	.10	.10	.97	1.03
Previous Pap test	-0.95	.23	-.27*	-.27	.97	1.03
Step 3						
Constant	3.85	0.58				
Conscientiousness	0.03	0.03	.05	.05	.91	1.11
Extraversion	0.01	0.03	.03	.03	.93	1.08
Agreeableness	0.02	0.03	.05	.04	.91	1.10
AFI	0.23	0.20	.07	.07	.94	1.07
Previous Pap test	-0.68	0.21	-.20**	-.19	.92	1.08
Health insurance	-0.29	0.14	-.12*	-.12	.96	1.04
Attitudes	0.38	0.06	.41***	.38	.88	1.14

Note. N = 210; R^2 = .05, F-ratio = 3.22 ($p \leq .05$) for Step1; R^2 = .13, ΔR^2 = .09 F = 10.06 ($p \leq .001$) for Step 2; R^2 = .30, ΔR^2 = .17 ($p \leq .001$), F = 24.99 ($p \leq .001$) for Step 3; *p ≤ .05, **p ≤ .01; ***p ≤ .001.

Using procedures described in Appendix D (p. D – 44) three outliers above the acceptable level (Field, 2009) were identified. Nevertheless, their reported intention scores in table 6.28 (Appendix D, p. D – 45) suggest that most outliers scored particularly low on intention. Given the high mean and median scores (see table 6.10,

above), it is unsurprising that these cases may be considered unusual and that their predicted intention scores deviate substantially from their actual scores. An analysis of their influence on the regression model finds that they had only limited impact.

Similarly, the two most influential cases with low CVRs (see Appendix D, p. D – 44, for details) have intention scores of 1—and this model, thanks to the high central tendencies, simply appears to predict high intentions scores more accurately. An examination of heteroscedacity supports this suggestion, see Appendix D (p. D – 44) for details.

In accordance with Field (2009), multicollinearity is unlikely to be problematic in this model. While further correlates with intention have been found, the regression process has demonstrated that, in the presence of the predictors included in the final model, these correlates explain an insignificant amount of the variance in intention.

Using G*Power the adequacy of the sample size for this regression model was confirmed. The analysis is shown in Appendix D (p. D – 44).

Multinomial logistic regression of uptake regularity. This analysis compares 220 women with regular Pap tests, 12 women who had had Pap test irregularly and 15 non-screeners. The large group differences mean that the findings presented below can provide only indications and grounds for further research, rather than conclusions.

Prior to regression analysis the associations of potential predictors with the respondents' uptake regularity were investigated. Table 6.30 (Appendix D, pp. D – 48) summarises the findings of the chi-square tests. Small group sizes may have influenced these tests: the expected counts were frequently smaller than 5, making type II errors more likely. Irregularly screened women were significantly more likely to report being unsure whether cervical cancer was related to lacking hygiene. Unscreened women were significantly more likely never to have been invited for a Pap test. Students were significantly more likely to be unscreened. Irregular screeners were significantly more likely to report dissatisfaction with their smear taker.

The non-parametric tests of the associations of continuous independent variables with uptake regularity agreed with the respective ANOVAs, except for extraversion, so the more conservative Kruskal-Wallis test is reported for each of these variables in table 6.31 (Appendix D, pp. D – 53). These found significant differences in age, intention, moral obligation, anticipated regret, perceived susceptibility, perceived barriers and benefits, attitude, subjective norms, levels of information about the Pap test and perceived mental health.

As there were fewer than 25 irregular and non-screeners the Kolmogorov-Smirnov test was used for post-hoc analysis. Three tests were conducted for each predictor; thus, using the Bonferroni correction the new α-level is .05/3 = .017. Table 6.32 (Appendix D, pp. D – 56) shows that regular screeners had significantly stronger intentions, felt a stronger moral obligation to attend and reported more perceived benefits than both irregular and unscreened women. Regular screeners were older, better informed, reported fewer screening barriers and more positive attitude than unscreened women. They also reported higher perceived susceptibility, more anticipated regret, and stronger subjective norms than irregularly screened women. Irregularly screened women also had weaker subjective norms and worse perceived mental health than non-screeners.

Similar to the previous regression, individual difference variables should constitute Step 1 of the multinomial regression; however, individual difference variables and uptake regularity were unrelated. Thus, the first step of this analysis investigates socio-demographics, as summarised in table 6.33.

Table 6.33

Step 1a: Multinomial Regression of Socio-Demographics

					95% CI	
Regular vs		B	SE	OR	Lower	Upper
Irregular	Intercept	-2.51	1.33			
	Age	0.02	0.04	1.02	0.94	1.10
	Occupation					
	At home	-1.21	1.19	0.30	0.03	3.07
	Professional/ manager	-1.22	0.75	0.30	0.07	1.29
	Clerical	1.38	0.99	0.25	0.04	1.75
	Manual	-18.19	0.00	$1.26E^{-8}$	$1.26E^{-8}$	$1.26E^{-8}$
	Student[a]					
Unscreened	Intercept	5.27	2.71			
	Age	-0.23*	0.10	0.79	0.65	0.96
	Occupation					
	At home	-17.15	3654.81	$3.57E^{-8}$	0.00	[b]

Table 6.33

Step 1a: Multinomial Regression of Socio-Demographics

					95% CI	
Regular vs		B	SE	OR	Lower	Upper
	Professional/ manager	-1.58	0.84	0.21	0.04	1.08
	Clerical	0.53	0.88	0.59	0.10	3.31
	Manual	-17.00	8520.77	$4.14E^{-8}$	0.00	[b]
	Student[a]					

Note. N = 214; R^2 = .14 (Cox & Snell), .23 (Nagelkerke), .16 (McFadden); Model χ^2 (10) = 31.28, p ≤ .001 ; Goodness-of-fit χ^2 (168) = 215.58 (Pearson), p ≤ .01, 71.44 (Deviance), non-sig.; * p ≤ .05; [a] reference category; [b] system missing

The model including age and occupation predicts uptake regularity significantly better than no model. Age is a significant predictor of uptake regularity: younger women were more likely to avoid screening than to attend regularly. None of the predictors, however, can differentiate regular and irregular screeners. The Deviance chi-square indicated that the predicted values are not significantly different from the actual values, but the Pearson chi-square disagrees. This may be due to over-dispersion, which led to empty cells in the analysis. According to Field (2009) more than 20% of zero frequencies render the goodness-of-fit measures unreliable. In this model 60.40% of cells were empty. Table 6.33 shows that the standard errors for manual labourers and women at home are very large and in line with the recommendations of Field (2009) occupation was removed from this regression model.

Table 6.34 summarises the regression without occupation as a predictor. The removal of occupation reduces the predictive power of the model as age can only distinguish regular and non-screeners. The proportion of empty cells decreased to 49.50% and the goodness-of-fit measures agreed that the predicted values do not differ significantly from the observed values. Therefore, the analysis continued without occupation as a predictor. For comparative purposes tables 6.35 – 38 show the regression analysis with occupation in Appendix D (pp. D – 57).

Table 6.34

Step 1b: Multinomial Regression of Socio-Demographics Without Occupation

					95% CI	
Regular vs		B	SE	OR	Lower	Upper
Irregular	Intercept	-2.06	1.36			
	Age	-0.02	0.04	0.98	0.91	1.05
Unscreened	Intercept	6.00	2.39			
	Age	-0.28*	0.08	0.76	0.64	0.89

Note. N = 247; R^2 = .09 (Cox & Snell), .16 (Nagelkerke), .12 (McFadden); Model χ^2 (2) = 24.10, p ≤ .001 ; Goodness-of-fit χ^2 (62) = 45.67 (Pearson), non-sig., 35.69 (Deviance), non-sig.; * p ≤ .05.

In the second step perceived mental health was added as a health risk factor. Table 6.39 shows that this addition produced a significant model and improved model fit. Irregular screeners reported worse mental health and older women were more likely to be regular rather than non-screeners.

Table 6.39

Step 2: Multinomial Regression of Risk Factors Without Occupation

					95% CI	
Regular vs		B	SE	OR	Lower	Upper
Irregular	Intercept	0.88	1.92			
	Age	-0.02	0.04	0.98	0.91	1.05
	Mental health	-0.16*	0.08	0.86	0.74	0.99
Unscreened	Intercept	3.13	3.12			
	Age	-0.28*	0.09	0.75	0.64	0.89
	Mental health	0.14	0.10	1.15	0.95	1.40

Note. N = 247; R^2 = .12 (Cox & Snell), .21 (Nagelkerke), .15 (McFadden); Model χ^2(4) = 31.06, p ≤ .001 ; Goodness-of-fit χ^2(352) = 265.25 (Pearson), non-sig.;* p ≤ .05.

As in multiple regression, these two steps constitute the control variables less amenable to intervention. For the following steps the controls were entered into two parallel models examining information levels (table 6.40) and EVT variables (table 6.41,

Appendix D, p. D – 61). Although the participants' satisfaction with their smear takers was associated with uptake regularity, unscreened women were unable to answer this item and, as before, it cannot be included in the regression. Thus no model of resource variables was estimated.

Table 6.40

Step 3a: Multinomial Regression of Information Levels Without Occupation

					95% CI	
Regular vs		B	SE	OR	Lower	Upper
Irregular	Intercept	3.28	2.42			
	Age	-0.01	0.04	0.99	0.92	1.06
	Mental health	-0.16*	0.08	0.85	0.74	0.99
	Information level (Pap test)	-0.36	0.23	0.70	0.45	1.09
Unscreened	Intercept	7.89	3.83			
	Age	-0.30*	0.10	0.74	0.61	0.90
	Mental health	0.10	0.10	1.10	0.92	1.33
	Information level (Pap test)	-0.49*	0.24	0.62	0.39	0.98

Note. N = 214; R^2 = .15 (Cox & Snell), .25 (Nagelkerke), .18 (McFadden); Model $\chi^2(6) = 34.13$, $p \leq .001$; Goodness-of-fit $\chi^2(392) = 410.32$ (Pearson), non-sig., 142.39 (Deviance), non-sig.; * $p \leq .05$.

The addition of Pap test information level resulted in a model significantly better at predicting uptake regularity than the baseline model and all measures for R^2 show improvement. While poor mental health continued to predict irregular attendance and older women remained more likely to be regular screeners than non-screeners, Pap test avoiders were also significantly less informed about the Pap test than regularly screened women. Table 6.36 (Appendix D, pp. D – 57), however, shows that information level did not predict uptake regularity when occupation was in the model.

Table 6.41 (Appendix D, pp. D – 61) shows Step 3b with the EVT variables in the model. This model is significant and fits the data well. There is a significant improvement in predictive ability, as indicated by R^2, and in the fit indicators compared to Step 2. This model also has better predictive ability than the model including Pap test information level, though this may be due to the large number of predictors entered. Irregular screening attendance, compared to regular attendance, is predicted by worse mental health, lower intention to attend and by seeing fewer benefits to screening, weaker subjective norms, having received a screening invitation, more positive attitude, and stronger moral obligation. Screening avoiders were younger and reported more barriers to screening than regular screeners. In comparison, table 6.37 (Appendix D, pp. D – 58) shows that although occupation is not a significant predictor when the EVT variables are included, the association of subjective norm with uptake regularity is not significant in that model.

The final step in this regression combined the significant predictors from Steps 3a and 3b: intention, moral obligation, perceived benefits and barriers, attitude, subjective norm, having been invited and information level (Pap test) predicted uptake regularity. These variables were entered into the final model, in addition to the controls (see table 6.42).

Table 6.42

Step 3: Multinomial Regression—Final Model Without Occupation

				95% CI			
Regular vs	B	SE	OR	Lower	Upper	Tol.[a]	VIF
Irregular							
Intercept	22.66	6.80					
Age	0.01	0.05	1.102	0.93	1.12	.94	1.06
Mental health	-0.37*	0.14	0.69	0.53	0.92	.98	1.03
Information level (Pap test)	-0.39	0.34	0.68	0.35	1.31	.97	1.03
Intention	-1.23*	0.47	0.29	0.12	0.74	.77	1.30
Moral obligation	0.77	0.54	2.17	0.75	6.25	.85	1.18
Perceived barriers	0.36	0.46	1.43	0.59	3.49	.74	1.35

Table 6.42

Step 3: Multinomial Regression—Final Model Without Occupation

				95% CI			
Regular vs	B	SE	OR	Lower	Upper	Tol.[a]	VIF
Perceived benefits	-3.64*	1.02	0.03	0.00	0.20	.75	1.33
Attitude	1.55*	0.73	4.56	1.14	19.43	.58	1.73
Subjective norm	-0.54*	0.23	0.58	0.37	0.91	.92	1.09
Invited for Pap test							
Ever	-2.37*	1.06	0.09	0.01	0.75	.93	1.08
Never[a]							
Unscreened							
Intercept	5.50	5.25					
Age	-0.20*	0.08	0.82	0.07	0.96	.94	1.06
Mental health	0.16	0.12	1.18	0.93	1.49	.98	1.03
Information level	-0.63	0.33	0.54	0.28	1.02	.97	1.03
(Pap test)							
Intention	-0.73	0.37	0.48	0.23	1.00	.77	1.30
Moral obligation	-0.32	0.28	0.73	0.42	1.26	.85	1.18
Perceived barriers	0.74*	0.37	2.10	1.02	4.331	.74	1.35
Perceived benefits	0.17	0.78	1.19	0.26	5.46	.75	1.33
Attitude	0.06	0.55	1.07	0.36	3.14	.58	1.73
Subjective norm	0.14	0.29	1.15	0.65	2.05	.92	1.09
Invited for Pap test							
Ever	-1.16	0.81	0.32	0.07	1.53	.93	1.08
Never[a]							

Note. N = 235; R^2 = .36 (Cox & Snell), .62 (Nagelkerke), .51 (McFadden); Model $\chi^2(20) = 104.52$, $p \leq .001$; Goodness-of-fit $\chi^2(448) = 900.69$ (Pearson), $p \leq .01$, 100.19 (Deviance), non-sig.; * $p \leq .05$; [a] reference category.

Although the final model is significant and fits the data well, the measures for R^2 suggest that this model predicts uptake regularity less well than the model including all EVT variables (see table 6.42). Irregular screeners reported worse

mental health, fewer perceived benefits, weaker intention and subjective norm, but more positive attitude than regular screeners. Irregular screeners were also more likely to report having been invited for a smear test. Non-attenders reported significantly more perceived barriers and were younger than regular screeners. A comparison with the findings in table 6.38 (Appendix D; pp. D – 60) shows that the exclusion of occupation resulted in information level, moral obligation and subjective norm contributing to the final model. In table 6.38 weak intention predicts screening avoidance, whereas this association merely approaches significance at $p = .05$ when these additional variables are included (cf. table 6.42).

The last two models (tables 6.41 and 42) found unexpected associations with having been invited and attitude. This may have resulted from over-dispersion, as explained in Appendix D (p. D – 62). Hosmer, Lemeshow and Sturdivant (2013) explain, however, that logistic regression models should contain no more parameters than 10% of the number of cases in the smallest outcome group. In this analysis the smallest group are irregular screeners with $N = 12$, therefore the multinomial regression model ought to contain no more than one or two predictors. The final model contains ten predictors for both comparisons, whereas the model with occupation includes only eight predictors. Both models necessitate a more even distribution of cases across the outcome groups, or a larger sample. Nevertheless, the final model without occupation appears to be more stable and predict uptake regularity better, as explained in Appendix D (p. D – 62).

Analyses of interaction and mediation. In combination the two regression models suggest a three-way relationship of attitude, intention and uptake history. In multinomial regression attitude and intention distinguished between regular and irregular screeners. For non-screeners compared to regular screeners, however, these associations disappeared. Although no multicollinearity was detected in either regression analysis, attitude was the most important predictor of intention; and being screened, rather than unscreened, also predicted intention. The graph in figure 6.5 illustrates the relationship of attitude, intention and uptake regularity.

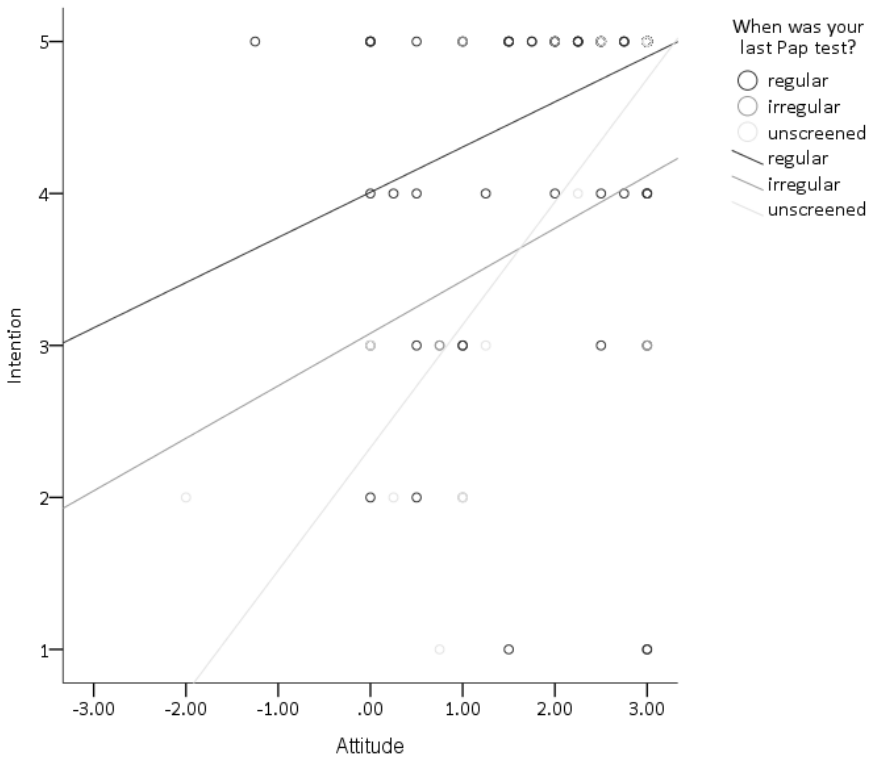

Figure 6.5. Attitude - intention fit lines for regular, irregular and non-screeners.

Figure 6.5 shows the interaction of uptake regularity, attitude and intention. The association of attitude and intention appears to be very similar in regular and irregular screeners, but entirely different for non-screeners. Both groups of screened women reported weak to moderate intentions, when very negative attitude was reported, but unscreened women with less negative attitude reported much weaker intentions. The slope of the regression lines indicates also that positive attitude might have a much stronger effect on intention in unscreened women than it has in either group of screened women, in which the regression lines have very similar slopes.

To test the effect of this interaction, the interaction term of previous Pap test was added to the final multiple regression model. Table 6.44 (Appendix D, p. D – 64) shows the complete analysis. In this model having ever had a Pap test and having health insurance continued to predict strong intention. The association with attitude, however, disappeared when the interaction term was entered, which was also a significant predictor of intention. Thus, any previous experience of cervical screening moderates the association of attitudes with intention. Figure 6.5 suggests that positive attitude is more strongly associated with high intentions scores in unscreened rather than screened women—who will report stronger intention than unscreened women, despite negative attitude. Regular screeners with negative attitude reported stronger

intention than irregular screeners, but both groups showed similar increases in intention scores as attitude becomes more positive.

Furthermore, the correlation procedure prior to the multiple regression of intention discovered several associations which subsequently disappeared in the regression models when attitude was entered as a predictor. This observation would support, for example, the idea that attitude might result from the perceived value of cervical screening and psychological barriers to attendance, as suggested in the discussion of EVTs in Chapter 4 and by the focus groups in Chapter 5. It is possible that the relationship between attitude and intention is mediated by these correlates.

Correlates of intention were tested for associations with attitude. Table 6.45 shows that all correlates of intention were also associated with attitude. These 10 variables were considered as mediators, as described the model in figure 6.6.

Table 6.45

Correlations With Attitude

Predictor	ρ
Moral obligation	.45***
Anticipated regret	.20***
Perceived barriers	-.41***
Risk stigma	-.18***
Perceived benefit	.31***
PBC	.22**
General health motivation	.21**
Conscientiousness	.19**
Agreeableness	.15*
Extraversion	.17*

Note. N = 210; * p ≤ .05, ** p ≤ .01, *** p ≤ .001.

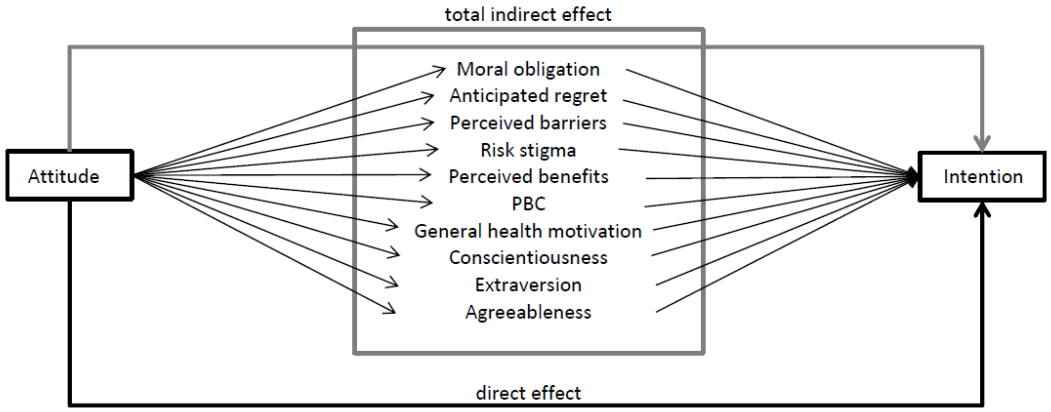

Figure 6.6. Model of multiple parallel mediators in the association of attitude and intention.

Ordinary least squares path analysis found that the data did not support the parallel mediator model. Table 6.46 (see Appendix D, pp. D – 65) summarises the analysis. Although attitude was a significant predictor of nine of the mediators, the mediators' associations with intention were not significant. Similarly, the total indirect effect of the mediators was not significant: the bootstrap confidence interval based on 1000 bootstrap samples crossed 0.00. The analysis found a significant direct effect of attitude on intention (see table 6.46). Nevertheless, there was a difference between the total effect of the model and the direct effect of attitude: while attitude alone explained 24.37% of the variance in intention, the model including the mediators explained 27.98% of the variance. This suggests that an indirect effect might exist which was too small to be detected with this sample.

Concluding remarks

In the present sample strong intentions to obtain Pap tests were predicted by being reimbursed for health care, having had a Pap test in the past and positive attitude towards Pap tests. Attitude was the strongest predictor of intention. None of the information variables was even bivariately associated with intention. Although power analysis indicated a sufficient number of participants, the intention data showed a strong tendency towards the upper limit of the scale and varied little. As a result the model appears to better at predicting cases with high intention scores.

As Pap tests are provided free of charge, it is interesting that health insurance status should predict screening intentions. This finding supports the argument in the systematic review that seeking health insurance might be an expression of interest in one's health. In bivariate analysis general health motivation was positively associated with intention. This association was not significant in the regression model—when insurance status was held constant. This observation supports the idea that having health insurance might indicate willingness to afford health care more so than ability to do so. Nevertheless, several other variables were also held constant in the regression of general health motivation and further research is required to examine this relationship.

Although the relationship between attitude and intention appears to be independent of any of their covariates, in multiple regression none of these covariates explained a significant proportion of intention when attitude was controlled. These observations add to evidence described in the discussion of EVTs which suggests that expectancy-value concepts are very similar, or at least affected by the same underlying mechanisms.

In addition, the association of attitude with intention seems to be stronger among unscreened women: unscreened women with negative attitude appear to be the most likely group to report weak intentions, while the intentions of unscreened women with positive attitude may be as strong as those of regularly screened women and even stronger than those of irregular screeners. Regular screeners reported the highest intention scores overall, which raises the question of what causes this difference in regular screeners.

In the regression model of uptake regularity, poorer mental health, fewer perceived benefits, weaker intention, weaker subjective norm, more positive attitude, and having been invited for screening predicted irregular attendance compared to regular attendance; whereas younger age and more perceived barriers predicted non-attendance. Although low information levels about the Pap test predicted non-attendance initially, the association disappeared in the final regression model.

Certain associations with uptake regularity are interesting. Seemingly, the two regression models disagree over the association of past behaviour and screening intentions. Given that having had a Pap test in the past predicted strong intentions in multiple regression, one would expect to find that intention can differentiate regular uptake from non-attendance. This association failed to reach significance, however, after occupation was excluded from the multinomial analysis and other EVT variables continued to account for some variance in the final model. The analysis including

occupation shows that intention would otherwise predict regular uptake compared to avoidance. Considering also the disproportionate group sizes, it is therefore likely that the lack of significance is an artefact of the analysis.

Although mental health differentiated regular from irregular screeners, the post hoc tests found that non-screeners reported significantly better mental health than irregular screeners. Women reporting good mental health might worry less or see doctors less frequently—and so have less motivation or opportunity to obtain a Pap test—than women who evaluate their mental health as poorer. But those women reporting the poorest mental health might worry so much about the procedure or previous abnormal results that they fail to return for further screening and become irregular screeners in this analysis. Fewer benefits and less satisfaction with their smear takers among irregular screeners further suggest disillusionment with the Pap test. Strange is, too, that irregular screeners should be more likely to recall screening invitations and report more positive attitude. Perhaps screening invitations are more important as cues to action among irregular screeners, but the bivariate tests dispute both associations. Similar to the issue concerning intention, these findings are possibly artefacts in an analysis with uneven outcome groups.

Furthermore, the association of socio-demographics and attendance deserves further attention. In agreement with Walsh and colleagues' (2010) findings, younger women were more likely to avoid Pap test, but of the socio-economic indicators only occupation was associated with cervical screening behaviour. Students were less likely to attend for Pap test than other occupational groups. The analyses of occupation was limited by empty cells, however, and younger women are more likely to be students, suggesting some collinearity between the associations of age and occupation with attendance.

Among screened women, satisfaction with their smear taker correlated positively with intention and regular attendance. This finding suggests that, especially to encourage re-attendance, system-level interventions that include screening provider training could be useful. To facilitate this, however, research must first assess whether satisfaction depends on ability to provide Pap tests or on interpersonal skill. The focus groups and previous Irish research (Bowe, 2004) indicate that both affect satisfaction.

Limitations. This study relied on 252 participants; while this number was sufficiently large to examine screening intentions, Hosmer et al. (2013) suggest that trustworthy

findings require approximately 120 irregular and non-screeners and these results must be considered with caution.

The analysis of the sample's characteristics showed that the results pertain particularly to young, well-educated women with support in health matters. The exclusion of women who have had a hysterectomy means furthermore that the findings are unable to account for their views or experiences. In the context of this study a group of interest could be women who have had a hysterectomy as a consequence of a positive Pap test result.

More than 200 women were excluded from the study to control for cultural differences. The nature of these differences, however, is difficult to examine as part of a general survey of uptake and warrants extensive research in its own right. The sample size also suffered from considerable attrition. Only limited data were available to examine differences between excluded, partial, and complete cases. Encouragingly, excluded women varied less from the sample than women who left early. It appears that particularly unscreened women with more barriers, more negative attitude and less satisfactory screening experiences were most likely to abandon the survey. Unfortunately, this may suggest that people who avoid Pap tests are also reluctant to participate in surveys. Indeed most of the sample had had a Pap test and attended regularly. A possible explanation is cognitive dissonance—evoked by engagement with the study—in unscreened women and those with weak intentions. These women would prefer to avoid the discomfort that cognitive dissonance creates (Festinger, 1957) and thus would avoid the study or leave it early. Waller, Bartoszek, Marlow, and Wardle (2009) found that non-attendance at screening also predicted failure to vote in elections. They explain that general social disillusionment could lead to cognitive dissonance after participating in research intended to improve some aspect of life.

Open questions. Cumulatively the findings suggest that strengthened intentions and reduced barriers to screening could encourage first attendance at cervical screening, whereas regular attendance would also require an improved perception of the benefits of screening. Common to all group comparisons, however, is the effect of strong intentions which improved screening attitude could strengthen in turn. This may be particularly important among unscreened women for whom this association appears to be stronger. Future research needs to establish causal directions among these associations.

Furthermore, this analysis indicates that information campaigns are unlikely to increase intention to attend screening or actual screening participation: apart from the lack of prediction by information levels, the majority of unscreened women recalled screening invitation letters or public advertisements of cervical screening, but even the majority of screened women found the latter to be unhelpful. In fact information levels about the Pap test and cervical cancer risk factors varied considerably in the sample and this was reflected by approximately half of the participants reporting to feel uninformed about cervical cancer. In bivariate analysis women at greater risk of cervical cancer were as likely to attend or to have weak intentions to attend as women at low risk, which corroborates the conclusion that risk information provision has little effect on intention or attendance. Instead, endorsement of screening by their GPs or important others appeared to be more memorable for unscreened women. This may point toward an advantage of person-focused over impersonally presented information. Nevertheless, even personal encouragement failed to encourage these women to obtain a Pap test; rather, women who did obtain Pap tests reported invitation letters as more important cues than personal encouragement. Screened women might have felt more obliged to obtain Pap tests when faced with the invitation letter than unscreened women might feel—this idea would be in keeping with the bivariate associations with attendance: the greatest difference in moral obligation emerged between regular screeners and non-screeners.

By demonstrating the predictive ability of benefits, barriers and attitude, this analysis supports the importance of EVTs. As the focus group study suggests that attitude results from balancing the perceived value of cervical screening and psychological barriers, there might be an interesting relationship between these variables. Although no significant mediators emerged from the covariates of attitude and intention, further research should investigate any covariation and consider moderating and mediating roles among them. While it is tempting to explain cross-sectional findings after the fact (Marsh, 1982), research like this survey is incapable of identifying causal patterns (de Vaus, 2001). The following chapter presents a small-scale experiment to compare informational and attitudinal interventions to increase screening intention, which will also examine effects on barriers and benefits identified as potential covariates in this study.

Chapter 7

Increasing positive attitude to strengthen screening intentions

~ Study 4 ~

The survey findings in Chapter 6 suggest a positive association of attitude toward the Pap test with screening intentions. The aim of this study is to investigate whether a manipulation of attitude can increase intentions to attend for Pap tests. In addition, the study examines how this relationship is influenced by perceived benefits and barriers found to correlate with attitude and intention and to be associated with cervical screening attendance.

Currently, the NCSP's attempts to improve screening intentions and increase attendance focus on factual information provision. The survey in Chapter 6, however, found information levels to be uncorrelated with intention and the evidence from the systematic review suggests that the success of information provision is uncertain and alternative strategies might be more successful. Moreover, the focus group participants found the NCSP information campaign easy to ignore and preferred to hear about women's experiences with cervical cancer prevention. The discussion of dual-process approaches in Chapter 4 summarised cross-sectional evidence of increased screening attendance following media portrayals of cervical cancer. These observations suggest that narratives might be a useful strategy to encourage positive attitude to screening and strengthen intentions to obtain Pap tests. This chapter presents a pilot intervention of women's accounts of cervical screening compared to factual information provision and to no intervention.

Researchers in the UK (Bennett, von Wagner, & Robb, 2015; McGregor et al., 2015) have studied the utility of narrative approaches in relation to bowel cancer screening participation. An experimental study showed that adding patients' experiences of bowel screening to the standard screening information created significantly greater perceived benefit of bowel screening and reduced negative affect, which appeared to result in stronger intentions to participate in bowel screening (McGregor et al., 2015). Participants in qualitative interviews found these narratives more relatable, more

descriptive of the bowel screening procedure and reassuring. Consequently, the participants experienced the narratives as more persuasive than factual information, but without feeling manipulated (Bennett et al., 2015).

In Australia O'Brien and Lee (1990) showed young and middle-aged women videos of a woman's experience of cervical screening. The videos' protagonists were matched to the participants' ages, but the videos were otherwise identical. Their purpose was to increase knowledge of cervical screening and encourage positive attitude. Compared to control participants, women who saw the videos reported increased knowledge, perceived susceptibility, perceived severity, more perceived benefits and fewer perceived barriers. The video particularly affect the perception benefits and barriers among younger women. Pre- and post-test regression analyses of cervical screening behaviour showed that the predictive ability of perceived susceptibility disappeared following the videos. The resultant model of post-test barriers, benefits and screening knowledge predicted 14 percent of the variance in screening behaviour. Thirty-four percent of the unscreened participants had obtained a Pap test at a five-week follow-up. O'Brien and Lee conclude that the videos successfully encouraged unscreened women to obtain Pap tests.

The findings in Chapter 6 applied especially to young women and in light of international concern around screening attendance in younger women (Weller & Campbell, 2009; Weller et al., 2009) this study focuses on women who are about become eligible to partake in the NCSP on their 25th birthday. Similarly, O'Brien and Lee (1990) focused on women aged 16 to 63 years. Organised cervical screening was introduced in Australia in 1991 and women become eligible for the programme at the age of 18 years. These sample characteristics suggest that the value of promoting cervical screening to women before they are expected to begin screening has been recognised in the literature.

Methodology

Research design. The experiment used a pre-post-test design of independent groups. There were four experimental conditions. The participants in the attitude-video condition (AV) watched a short clip of screened women conveying their positive attitude towards the Pap test. The participants in the information-video (IV) condition saw a clip of the same women providing information about HPV, cervical cancer and the Pap test. This condition tested the effect of message content. In the reading

condition (R) the participants received the content of AV as reading material rather than a video to test the effect of the message source. Finally, the participants in the no-treatment (NT) condition received a video irrelevant to cervical cancer screening or illness prevention.

The independent variable is the type of intervention, which is operationalised as group membership in AV, IV, R or NT. Conditions were assigned by quasi-randomisation. The participants were asked for the last four digits of their phone number, which were used as an identifier. A lottery decided what digit combinations would be assigned to what intervention.

The dependent variable is intention to obtain a Pap test. Intention is operationalised as the score on Bish and colleagues' (2000) one-item intention scale. Attitude is thought to be the mechanism leading to changes in intention. It is defined in accordance with TPB (Hennig & Knowles, 1990; Hill, Gardner & Rassaby, 1985). Negative attitude towards the Pap test is operationalised as a low total score on the attitude scales used by Hennig and Knowles, and also by Hill and colleagues; positive attitude is operationalised as a high total score on the attitude scales. To assess any immediate effects of the intervention, participants were asked if their attitude and intentions had changed as a result of the intervention immediately after the intervention. Post-test attitude and intention were measured between 2 and 4 weeks after the intervention using the same measures as the pre-tests. The analysis compares the pre-post changes in attitude and intention between conditions and examines the variation between the groups in attitude and intention immediately after the interventions.

In addition, the analysis investigates any effects of the interventions on perceived barriers and perceived benefits, which covaried with attitude and intention and predicted screening attendance in the survey study (see Chapter 6) and were suggested as important influences on attitude formation by social-cognitive theorists (see Chapter 4) and in the focus groups (Chapter 5).

Controls. Although quasi-random assignment was expected to reduce differences between the experimental groups, pre-tests can account for any remaining differences. For example, the pre-post-test design could identify data from participants with highly positive attitude before the intervention.

Personality variables and general health motivation correlated with attitude and intention in the survey prior to this study. These variables were therefore measured as covariates and to ensure similarity between the groups. Education level was measured

for this purpose as well. During data collection these variables also distracted from the outcome measure.

The conspicuous assessment of the dependent variables immediately before and after the intervention exposed the purpose of the study to the participants and created high demand characteristics. Nevertheless, deception to reduce demand characteristics appears to be unjustified by the purpose of this study. If the intervention would be used in future public cervical screening campaigns, there would be no possibility to deceive viewers of the purpose of the intervention. Similarly, O'Brien and Lee's (1990) refrained from deceiving their participants, although their intervention material would have generated equal demand characteristics. Instead the outcome assessment was approached directly, almost dialogically with the participants, to control the effect of high demand characteristics. The immediate post-test measures for intention and attitude varied from pre-test, asking about change rather than absolute values; and participants were asked to provide explanatory comments, so the analysis could glean more insight in any potential immediate effects. The pre-test and follow-up questionnaires were very similar; however, a delay of 2 to 4 weeks between them should have minimised practice effects and participant fatigue. The immediate post-test was very short and minimal drop-out was expected due to the brevity of the experiment.

Online administration eliminated observer bias and automatically double-blinded the experiment. Online distribution of the study meant maximum flexibility for the participants: they were able to participate wherever and whenever they liked. The absence of a researcher during the administration of the experiment was expected to further reduce demand characteristics and social desirability biases.

Recruitment strategies. Participant recruitment occurred online and offline, to somewhat attenuate exclusion due to non-use of email or online social networks. As the offline recruitment was limited to poster distribution around campus and an article in a local newspaper, offline recruitment was very much Cork-based.

Online distribution. Similar considerations as those discussed in Chapter 6 apply to this study. On the one hand, online distribution can ease data collection, provides easy-to-use re-direction mechanisms that account for participants' prior responses, and can save time (Whitley, 2002). Given the transparent design of this study any reduction of social desirability due to the absence of the researcher is also valuable, as is the opportunity to recruit participants outside the university population.

On the other hand, online distribution may exclude participants without internet access or with low literacy (Whitley, 2002). CSO (n. d.) statistics show that 86% of surveyed 16- to 29-year-olds used the internet every day in 2014. This figure suggests that in the sampled population of 23- and 24-year-olds lack of access to the internet as a reason for inadvertent exclusion is of less concern than in the previous study. Important considerations are, however, less control over the study environment and increased attrition. While the survey software used for this study is designed to run well also on portable devices, the participants needed a good enough internet connection to play the intervention videos and audio output. Interested women might have accessed the study website in environments where noise from audio output was undesirable or where the videos failed to load. Such factors can add to attrition.

Sample size and sampling. Although Whitley (2002) suggests that the power of any test should be at least greater than .5, so better than guessing, Cohen (1988 as cited in Field, 2009; 1992 as cited in Whitley, 2002) argues that statistical power should be larger than .8. A priori power analysis with G*Power suggests that a one-way ANOVA investigating immediate change in attitude or intentions would require the sample sizes shown in table 7.1. The sample sizes required for a 2x4-ANOVA to examine pre- and post-test changes in intentions are shown in table 7.2.

Table 7.1

A Priori Power Analysis for One-Way ANOVA

	Total N required	
Effect sizes	Power: 1-β = 0.5	1-β = 0.8
small (d = 0.1)	580	1096
moderate (d = 0.3)	68	128
large (d = 0.5)	28	48

Note. Analysis for 4 groups at α = .05

Table 7.2

A Priori Power Analysis for 2x4-ANOVA of Intention

	Total N required	
Effect sizes	Power: 1-β = 0.5	1-β = 0.8
small (d = 0.1)	112	200
moderate (d = 0.3)	24	32
large (d = 0.5)	16	24

Note. Analysis for 4 groups at α = .05 with 2 points of measurement, non-sphericity correction = 1, r pre and post = .73 (taken from survey study)

According to Robson (2002) large effect sizes are preferable; but in the previous study attitude explained 9.99% of the variance in intention when other predictors were controlled. The corresponding part correlation was r = .38; therefore moderate to large effects are expected and 32 to 128 participants should be recruited.

This experiment relies on a convenience sample. The inability of convenience samples to represent their population reliably has been criticised in the literature (Breakwell et al., 2006; de Vaus, 2001; Robson, 2002; Whitley, 2002). This was more problematic, however, for the previous study than for this experimental design, in which equality of the groups is more critical. Pre-tests for differences between the groups in demographic and personality controls as well as in intention, attitude and their covariates can be used to ensure this.

Method

Participants. Women aged 23 and 24 years who have never attended for a Pap test were eligible to participate. To control for cultural influences the participants must have been born in Ireland and must not have lived outside Ireland for 12 months or longer. The study excluded women who had had a hysterectomy, because some might not remember correctly whether they require any Pap tests.

Participants were recruited via poster advertisements and ads on mailing lists and social networking websites, such as Facebook. Online and print newspaper articles about the study were released to aid recruitment. As an incentive to participate, respondents were offered to be included in a draw for two €20 One-4-all vouchers.

Materials. The poster shown in figure 7.1 (Appendix E, p. E – 2) was used to recruit participants. The questionnaires used for data collection are shown in Appendix E (pp. E – 3).

Measures. At pre-test, attitude was assessed using the global and specific attitude measures adapted from Hill and colleagues (1985). In contrast to the survey in Chapter 6, assessment brevity was of less concern in this study. In this study attitude is an outcome variable and a better understanding of the intervention effect might be gained from this more detailed assessment of attitude. The global scale asks *For you, how would it be to have a Pap smear when you are 25?* for four semantic differentials with seven-point response scales: *good – bad; wise – foolish; favourable – unfavourable; beneficial – harmful*. The participant's score is the sum of the four items. Neither Hill et al. nor Hennig and Knowles (1990) provide scale reliabilities for their samples; Cronbach's $\alpha = .82$ for this sample.

Global attitude was compared to the specific attitude measure, which is the sum of the total belief strength score and the total outcome evaluation score. Belief strength is measured on a seven-point Likert-scale from (-3) *extremely unlikely* to (+3) *extremely likely*. The scale has seven items which are presented in the questionnaire in Appendix E (p. E – 6). For the same items the outcome evaluation scale measures responses to the question *For you, how good or bad would each of these outcomes be?* on a similar seven-point Likert-scale from (-3) *extremely bad* to (+3) *extremely good*. In this sample Cronbach's α for specific attitude was .55.

Immediate change in attitude after the intervention was assessed as *Has this experience changed your attitude to the Pap test?* on a seven-point scale from (+3) *yes, a lot more positive* to (-3) *yes, a lot more negative*. At follow-up, attitude was assessed using the measures by Hill and colleagues (1985).

Pre-test intention was measured with one item from Bish, Sutton and Golombok (2000; *How likely is it that you will attend for a Pap test when invited?*) on a nine-point scale from (1) *extremely likely* to (9) *extremely unlikely*. To appropriate the item for my sample of young women the wording was changed to *How likely is it that you will attend for a Pap test when you are 25?* The original five-point scale was changed to nine points in order to detect more subtle variations in intention.

Immediate change in intention was measured similarly to attitude as *Has this experience changed your intention to have a Pap test when you are 25?* on a nine-point scale from (1) *Yes,*

I'm a lot more likely to have a Pap test now to (9) *Yes, I'm a lot less likely to have a Pap test now.* At follow-up the intention measure by Bish et al. (2000) was used again.

Perceived barriers were assessed as in the previous study, i.e. using Hill and Gick's (2011) 11-item scale with three additional items. The items are measured on a seven-point Likert-scale from (1) *strongly disagree* to (7) *strongly agree.* The score constitutes the mean of 14 items. Hill and Gick report an α of .89. In this study α was .90. The scale was administered a second time at follow-up.

Perceived benefits were measured using the scale from the previous study which combined three benefit items from Allahverdipour & Emami (2008, α = .74) and four items from Kahn et al. (2003). The score is the mean of all seven items. In this study α was .89. The scale was repeated at follow-up.

Controls. Education level was assessed with the item from the previous study by asking participants to select the highest education level completed in accordance with the categories of the Nation Qualifications Authority Ireland (2009).

Rammstedt & John's (2007) 10-item BFI questionnaire was used to assess personality. The questionnaire uses a five-point Likert-scale from (1) *strongly disagree* to (5) *strongly agree.* The respondents are scored on five dimensions measured by two items each. The participants' scores are the sums of the two items per dimension. Scale reliabilities are displayed in table 7.3

Table 7.3

Big Five Scale Reliabilities

	α	
	Rammstedt & John (2007)	present sample
Complete BFI scale	.75	.10
Openness	.72	.23
Conscientiousness	.77	.48
Extraversion	.83	.67
Agreeableness	.68	.43
Neuroticism	.74	.52

Note.

General health motivation used the scale from Hennig and Knowles (1990). The score is the sum of two items, which are assessed on a seven-point scale from (1) *not at*

all to (7) *extremely*. Hennig and Knowles fail to report Cronbach's α; for this sample α = .65.

Materials for the experimental conditions. The experimental conditions required three short videos and one set of written material. The attitude video and the information video were written and recorded by the researcher with the help of lay actresses who portrayed women aged 25 and 26 years who had recently obtained a Pap test. In the attitude video the actresses engagingly report positive screening experiences. In the information video the same actresses present information about the Pap test, HPV, cervical cancer and its risk factors. In both videos the actresses address the audience directly, but in the information video the actresses are impersonal.

The third video is unrelated to preventive health care or cervical cancer screening and matches the other two videos in length.

Finally, the reading matter presents the content of the attitude video in written format—which is shown Appendix E (pp. E – 18) along with the transcript of the information video. It consists of short paragraphs of direct speech reporting young women's experiences of their recent Pap tests. The Flesch Reading Ease (FRE) and Flesch-Kincaid Grade Level (GL) formulae, provided by Microsoft Word 2010, were used to assess the readability of the reading material. On the FRE scale from 0 (very hard) to 100 (very easy) the attitude-related text achieved a score of 90.00. GL placed the text at reading grade 3; i.e. both formulae agree that the attitude reading material is very easy to read.

Setting and procedure. The experiment was administered online meaning the participants could complete it whenever and wherever they desired. Nevertheless, the participants required internet access and a system with audio output to complete the study. All participants accessed the welcome page of the study via the link provided in the study's advertisements. This page explained the purpose of the study and informed the participants about their anonymity and the confidentiality of their information. It provided contact details for further questions about the study or cervical screening. After giving informed consent, all participants were redirected to a page assessing the inclusion criteria for the study and were asked to provide the last four digits of their mobile phone number, to be used as an identifier. All participants who met the inclusion criteria were then redirected to the pre-test page. This page assessed personality, general health motivation, intentions, attitude, perceived barriers and perceived benefits in relation to the Pap test. The pre-test was followed by the

intervention pages. Depending on their identifier, the survey redirected the participants to the attitude video, the information video, the reading material or to an irrelevant video. Following the intervention the participants took the post-test, which assessed immediate self-reported change in attitude and intention. Comment boxes were provided for both items and the participants were asked to give more detail. The last page of this questionnaire explained about the follow-up and provided a link to a second questionnaire which collected the participants' email addresses independently of their study information. It then thanked the participants for their help, debriefed and repeated contact details for any questions.

On the second questionnaire the participants provided an email address at which they were contactable for follow-up data collection and to be included in the prize draw. The participants were informed that their email address was collected separately from their responses, could not identify them, and would be stored securely to further ensure confidentiality and anonymity.

Participants who provided an email address for follow-up were contacted 2 weeks after providing their email address and invited to participate. They were provided with a link to the follow-up questionnaire, which asked for their informed consent and their four-digit identifier. The next questionnaire page collected data on intention, attitude, perceived benefits, and barriers using the same measures as the pre-test. A comment box was also provided. Participants who failed to complete the follow-up within 4 weeks of providing their email address were emailed a reminder. Thus, the participants were followed-up within 2 to 4 weeks of the intervention.

Statistical analysis. Prior to inferential statistics all variables were tested for normality using the K-S test, sample characteristics and baseline differences between the experimental groups were assessed.

Following this, any differences in immediate change in attitude and intention between the experimental groups were examined using univariate tests. After post-test distributions were checked for normality and group differences in the pre-test scores of the follow-up sample were investigated, group differences from pre- to post-test in attitude, intention, perceived benefits and barriers were examined.

Comments provided at immediate post-test and follow-up were analysed using Content Analysis as described by Vaismoradi, Turunen and Bondas (2013). Comments were examined separately for each question and grouped by experimental condition.

The comments were line coded initially and then grouped into categories. The analysis presents a summary of these categories for each condition.

Results

Sample analysis. Figure 7.2 shows the participant flow through the study. The inclusion criteria were not met by 491 women. Of the 390 eligible women, who consented to participate, 233 women provided an identifier and could be assigned to an experimental group. In total 47 women were allocated to AV, 56 to IV, 55 to R and 75 to NT, but 141 women provided incomplete data. There was no significant association between the experimental group and the frequency of drop-out: χ^2 (3) = 0.60, p =.90. This means the sample size is 92 participants with 19 women in AV, 21 in IV, 20 in R and 32 in NT. Twenty-two women provided follow-up data.

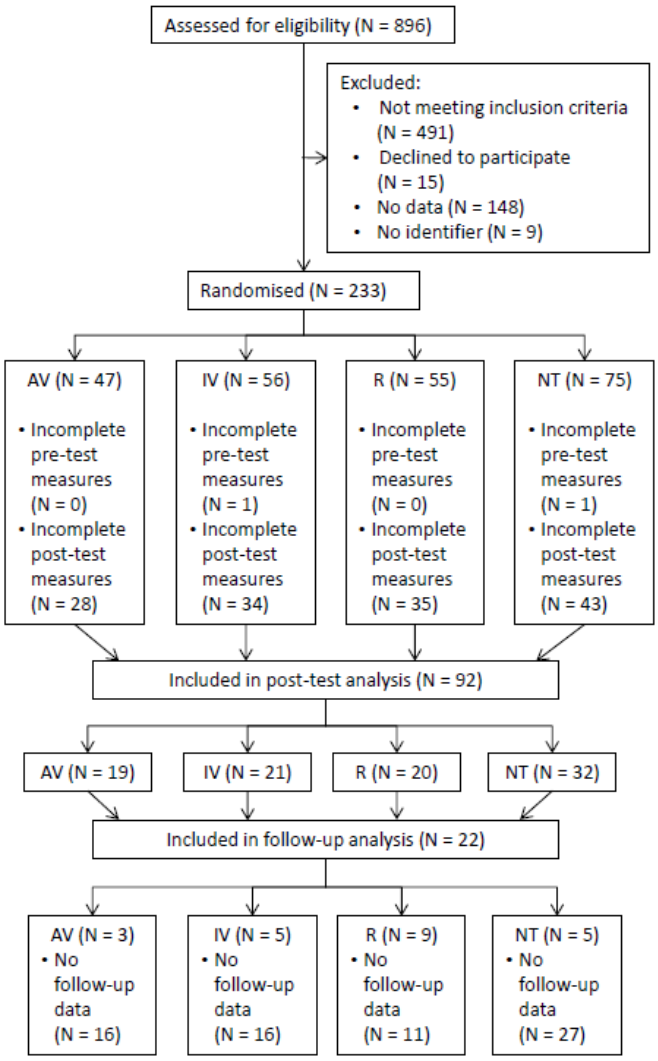

Figure 7.2. Participant flow

Table 7.4 (see Appendix E, p. E – 21) shows the distribution of personal characteristics across the total sample and by experimental group. The majority, 71%, were 23 years old. The median general health motivation scores tended towards or just above the scale mid-point. Across the entire sample the scores on none of the control variables were normally distributed; this contrasts the group distributions, which were more frequently normal, especially for NT and R. Analyses of variance and Kruskal-Wallis tests agreed that there were no significant differences between the groups. Table 7.5 (Appendix E, p. E – 22) shows the details of the more powerful parametric tests.

Figure 7.3 shows the distributions of educational qualifications for the total sample and each experimental condition. The sample was well educated. Approximately 45% had a primary degree and 14% had a postgraduate qualification. There were no significant differences in education level between the experimental groups: χ^2 (18) = 15.56, p = .66, V = .24. Over three quarters (78.6%) of the table cells were empty, however, which could have underpowered the test and prevented significant differences from being identified (Field, 2009).

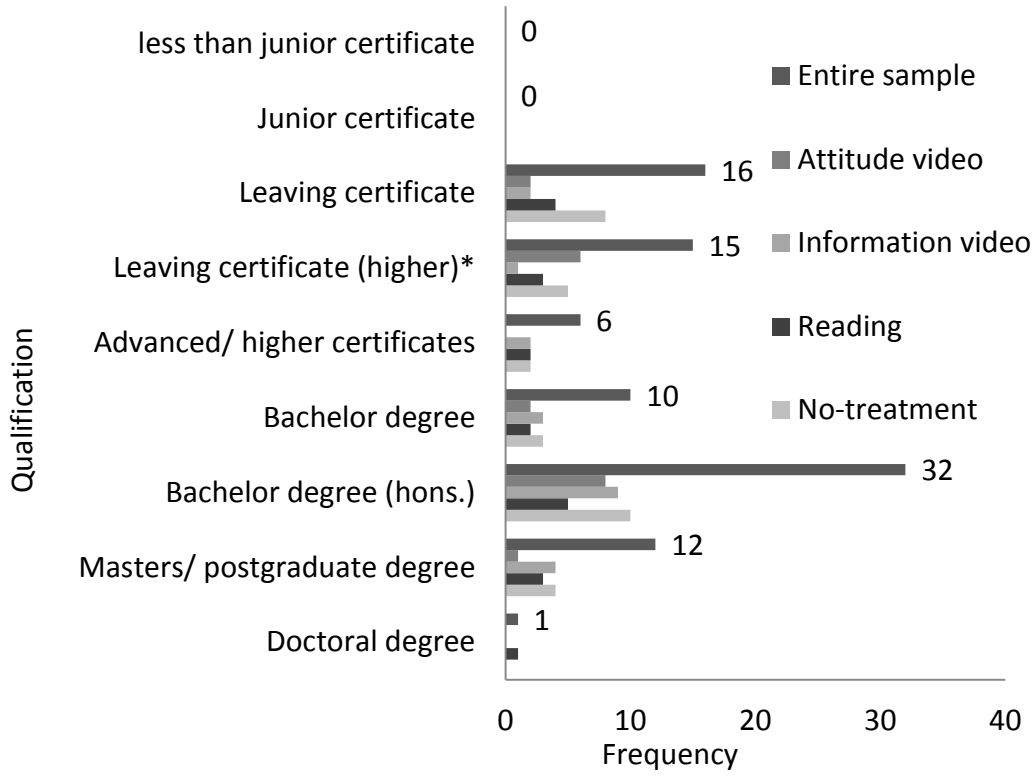

Figure 7.3. Distribution of education level. * Leaving Certificate with higher level courses

Table 7.6 (Appendix E, p. E – 22) shows the central tendencies of the EVT variables for the entire sample and for each experimental condition at pre-test. Only the distribution of specific attitude was normal across the groups. ANOVA found no significant differences in specific attitude between the groups: $F(3, 87) = 0.10$, $p = .96$, $\omega^2 = -.03$. The Kruskal-Wallis tests for the remaining variables are shown in table 7.7 (Appendix E, pp. E – 22). There was a significant difference in perceived benefits, which suggests the randomisation has not been effective. Table 7.8 (Appendix E, p. E - 23) shows the post hoc analysis using Kolmogorov-Smirnov's z-test, because only the no-treatment group had more than 25 participants. Six comparisons were tested resulting in a Bonferroni-corrected α-level of .01 (.05/6 = .008), but none of the post hoc comparisons achieved a p-value below this level. The comparison of R and NT achieved the lowest p-value, i.e. participants in the no-treatment group reported significantly more perceived benefits than participants in the reading group.

A large number of cases showed missing data on the measure of perceived barriers. The majority of these, N = 42, were missing data on the same two barrier items. Using data from the survey in Chapter 6, Cronbach's α and total score correlations were computed for the entire scale and the scale without these two items. Cronbach's α for the 14-item-scale as well as the 12-item-scale was .87. The scales correlated significantly at $r = .99$ ($p \leq .001$). Consequently, the mean of the remaining 12 items in this dataset was taken to replace the missing values for these two items. The number of cases with missing data on the barrier scale was thus reduced to four cases. Table 7.9 (Appendix E, p. E – 23) compares the original distribution to the treated distribution of perceived barriers. After missing data treatment the overall distribution became non-normal. Kruskal-Wallis tests and ANOVA agreed that there were no significant differences in perceived barriers between the groups before or after the missing data treatment: $F_{before}(3, 46) = 0.25$, $p = .86$, $\omega^2 = -.05$; and $F_{after}(3, 84) = 1.76$, $p = .16$, $\omega^2 = .03$.

Immediate change. This section investigates differences in the immediate post-test measures, i.e. changes in attitude toward the Pap test and changes in intention to attend for a Pap test. The relevant hypotheses propose that

a) there will be a significant difference between the four groups in the magnitude of change in attitude; and
b) there will be a significant difference between the four groups in magnitude of change in intention.

Descriptive analysis. Table 7.10 shows the central tendencies and normality tests of the two variables assessing change in attitude and intention for the entire sample and for each condition. As a whole, the participants reported mild change towards more positive attitude and stronger intentions to obtain a Pap test. IV reported the greatest increase in positive attitude, while IV and NT reported moderately increased intention. The data were non-normally distributed in every instance.

Table 7.10

Distribution of Variables Assessing Immediate Change

	Mean (SD)	Median	Normality[a]
Attitude change (N = 94)	0.72 (1.25)	0.00	.28**
Attitude video (N = 20)	0.79 (1.06)	0.00	.36**
Information video (N = 21)	1.05 (1.56)	1.00	.23**
Reading (N = 21)	0.45 (1.00)	0.00	.28**
No-treatment (N = 32)	0.63 (1.29)	0.00	.28**
Intention change (N = 94)	6.70 (2.03)	6.50	.19**
Attitude video (N =20)	6.84 (1.80)	6.00	.19**
Information video (N = 21)	6.57 (2.11)	7.00	.20*
Reading (N = 21)	6.10 (2.22)	5.00	.24**
No-treatment (N = 32)	7.06 (1.97)	7.00	.21**

Note. [a] K-S test; * $p \leq .05$, ** $p \leq .01$

Figures 7.4 and 7.5 (Appendix E, p. E – 24) show how the scores on both scales were distributed across the entire sample and each group. It is apparent that, while 52.17% of the participants reported no change in attitude, most of the remaining participants reported mildly to considerably more positive attitude toward the Pap test (cf. fig. 7.4). Furthermore, the distributions of intention scores in figure 7.5 are bimodal. All groups, and also the entire sample, show a second mode at *9: yes, a lot more likely*.

Inferential statistics. ANOVA and Kruskal-Wallis tests agreed that there are no significant differences in attitude or intention change between the groups, so the more powerful tests are reported: $F_a(3, 88) = 0.87$, $p = .46$, $\omega^2 = -0.49^{E-3}$; $F_b(3, 88) = 0.99$, $p = .40$, $\omega^2 = -0.44^{E-2}$.

Follow-up analysis. This analysis investigated the following hypotheses:

a) there will be significance differences between the groups in how much their attitude differed at follow-up from their attitude at pre-test;
b) there will be significance differences between the groups in how much their intention differed at follow-up from their intention at pre-test; and
c) there will be significance differences between the groups in how much their scores on the covariates differed at follow-up from their scores on the covariates at pre-test.

Descriptive statistics. Twenty-two participants completed the follow-up questionnaire. The sample sizes for each condition were very small: $N_{AV} = 3$, $N_{IV} = 5$, $N_R = 9$, and $N_{NT} = 5$. Particularly problematic is the lack of participants in AV, which tests the main intervention. Table 7.11 (Appendix E, p. E – 25) summarises the central tendencies of the post-test scores. Missing data on the perceived barriers scale at post-test were treated in the same way as the pre-test data. Comparative values can be seen in table 7.11. The data treatment ameliorated the lack of variation in perceived barriers; but all three participants in AV reported very strong intention at pre-test, which led to a lack of variation in the outcome variable. To solve this problem the active intervention conditions were merged into one treatment group (T) for the follow-up analysis and compared to the control condition: $N_T = 17$ and $N_{NT} = 5$.

When the analysis was limited to participants who completed the follow-up, there were no significant differences in the four-group or two-group comparisons of age or the individual differences measures (see tables 7.12 and 7.13 in Appendix E, pp. E – 26). Chi-square tests found no significant difference in education for either comparison: $\chi^2_{4\text{ groups}}(15) = 10.12$, $p = .94$, $V = .39$; and $\chi^2_{2\text{ groups}}(5) = 3.19$, $p = .72$, $V = .38$.

The Kruskal-Wallis test was used to investigate pre-test differences in attitude and intention between all four groups (see table 7.12). There were significant differences in perceived benefits at pre-test. Table 7.14 (Appendix E, p. E – 28) shows the Kolmogorov-Smirnov z-tests for the post hoc analysis. As six tests were carried out, the Bonferroni-corrected α-level is .01 (.05/6 = .008). The comparison of IV and R achieved the lowest p-value: IV reported more perceived benefits (Median = 4.43) than R (Median = 3.57). The size of this effect was moderate and suggests that the randomisation procedure had been ineffective. The moderate effect sizes for the

comparison of AV and R as well as R and NT indicate that further differences might exist that are not significant due to small group sizes. To assess pre-test differences in attitude, intention and their covariates between the treatment and no-treatment groups, the Kolmogorov-Smirnov test was used as shown in table 7.13. No significant differences were found. Combining the active intervention groups eliminated the group differences in perceived benefits.

Inferential statistics. Five 2x2 mixed analyses of variance compared the treatment and no-treatment groups, to test hypotheses a, b, and c. Table 7.15 (Appendix E, p. E - 28) summarises the tests. Although plots of the estimated marginal means showed trends in accordance with hypotheses a and b (cf. figures 7.6 to 7.8 in Appendix E, pp. E – 29), the analyses of variance for intention, global, and specific attitude found no significant differences. Testing hypothesis c, the analyses of variance for perceived barriers and perceived benefits also found no significant differences. Table 7.15 (Appendix E, p. E – 28) shows that the effect sizes were minute and the tests were noticeably under-powered. This might be caused by the small sample sizes.

In order to solve this problem, pre-minus-post score differences were calculated for these five variables and Kolmogorov-Smirnov tests were used to identify significant differences between the treatment and no-treatment conditions. The effect sizes of the z-test were larger than those of the analyses of variance, but none of the tests reached significance; table 7.16 provides a summary.

Table 7.16

Kolmogorov-Smirnov tests of pre-post differences

	z	sig.	effect sizes (r)
Intention (N = 22)	.35	0.81	.17
Global attitude (N = 21)	.68	0.46	.15
Specific attitude (N = 22)	.88	0.25	.19
Perceived barriers (N = 22)	.69	0.55	.15
Perceived benefits (N = 22)	.67	0.55	.14

Note. N = 18

Content analysis. Immediately after the experiment 68 participants provided comments regarding its effect on their screening intention; 71 women commented on its effect on their attitude. Only one participant commented at follow-up.

In summary, very similar themes emerged from the comments on intention change and attitude change—and across conditions. In each instance participants used the comments to affirm that their attitude and intention were the same as before intervention; however, some participants in each group also reported change towards more positive attitude and stronger intention. The participants frequently commented positively on cervical screening, but it was unclear whether these remarks had resulted from the intervention. R was the only group where such positive comments appeared solely in relation to intention change. While AV most frequently confirmed no change in their attitude or intention, R and NT most often reported to be more positive about screening after the intervention. IV had made positive comments about screening and comments about increased positivity equally often.

Comments following the attitude video. In this group, women who reported no change explained that they had received no new information from the video, were already aware of the Pap test and its benefits and had already been intent on obtaining Pap tests prior to the study. Other women reported to have stronger intentions to obtain a Pap test after the video or, at least, to be less determined to avoid it in the future. After the video they were more aware of the Pap test, realised its importance, felt less anxious about it and knew now that it was easy to obtain and what to expect. In addition, the participants reported to be determined to get a Pap test, reiterated its benefits and its value, but gave no indication whether this was influenced by the video. One participant reported that she was as determined to avoid screening as she had been before the study. Two participants talked about taking control of their health in the future, or in the past by getting the HPV vaccine.

Comments following the information video. Some women in this group also reported that their intentions had not changed after the video or that they were feeling just as embarrassed or anxious as before, or—critically—that they had got no additional information from the video. One participant explained that her anxiety and embarrassment would prevent her from getting a Pap test in the future. Much more frequently, however, the participants reported realising the benefits of the Pap test, its importance and the ease of obtaining one. They felt obliged to obtain a Pap test and felt distinctly that its benefits outweighed the negative aspects of Pap testing. These women perceived HPV infections as severe and as threatening their fertility. Even benefits delayed into the future were important to them. One woman expressed her gratitude for having been provided with screening information through the video. Another woman

explained that without her GP recommending it recently, she would never have thought about Pap tests. Similarly, one participant had been unaware of Pap tests before the study and another explained that the new information had increased the importance of Pap tests in her opinion. As in AV, one woman reported having got the HPV vaccine.

Women who commented explicitly on the effect of the video felt better informed and more motivated to obtain Pap tests. These women also reported stronger intentions after the video, as well as increased knowledge and awareness; for example, one participant explained she had previously felt Pap test were for women much older than her. Two women said they would be proactive about getting Pap tests in the future and would avoid procrastination. They felt more enthusiastic about cervical screening, or even felt obliged to do screening. Another woman, however, said she did not expect to obtain a Pap test in the future, despite feeling obliged to do so.

Comments from the reading group. Many of the themes of AV and IV occurred also in the reading condition. Thus, some women reported no change in intention or attitude, not having received any new information or having been intent on getting Pap tests prior to the study. Women in this group also reported never having heard about the Pap test before the study or to have intended to avoid it, because they were embarrassed. While one participant felt that she had no need for a Pap test after reading the stories, another said "what struck [her] was the girl who had to get treatment" and one woman realised through the stories that other women were just as embarrassed as herself. Similarly, participants felt greater ease attending Pap tests after the intervention and said they were more likely to go. They also reported increased awareness and knowledge, realised the benefits of the test and that it was free. They found the accounts reassuring, especially the information that the test was painless. One woman in this group also said she wanted to avoid procrastination on getting tested. In addition, two participants remarked that a female smear taker was important to their attendance.

Comments after no treatment. Some women in this group also reported that their attitude and intentions had not changed, that they had received no new information or had intended to obtain Pap tests prior to the intervention. While the participants frequently made positive comments about cervical screening and said they were determined to attend in the future, others felt anxious, embarrassed or expected discomfort from the Pap test. One woman said all her fears had been confirmed by the study. Another participant was disappointed that self-administration had not been introduced for the Pap test yet. In this group, too, some participants provided evidence

of desiring to be in control of their health or reported having been unaware of cervical screening before the study. Nevertheless, the participants also reported to be more likely to attend for a Pap test after the study, felt more aware and less anxious or embarrassed, were better informed and more familiar with the concept of cervical screening. The study had started them thinking about the Pap test.

The similarity of these comments to those from the other three groups is interesting as the video in the no-treatment condition was unrelated to health care entirely. Some participants, on the one hand, referred explicitly to effects of the questionnaire and pointed out that the video had had no effect. On the other hand, some participant took great interpretive leaps to relate the video to cervical screening or voiced their frustration at being unable to achieve this.

Comment at follow-up. Only one participant (R, 23 years) left a comment at follow-up: "Cervical cancer is primarily [caused] by the HPV virus, which is an STI. As I am a virgin, the likelihood of me having CIN on a smear is low. I am not likely to enter the screening program until I am sexually active". This participant appears to be informed and to use that information to deliberate on the likelihood of her obtaining a Pap test at the age of 25 years. At follow-up she chose 6 on the nine-point intention scale, which suggests that she is undetermined, but with a tendency to obtain a Pap test when she deems it necessary.

Concluding remarks

The statistical analysis failed to reject any of the null hypotheses. Significance tests of group difference in attitude and intention change after completing the study were non-significant, neither were tests of group difference in attitude and intention—or their covariates—at follow-up. This may be due to characteristics of the intervention material, such as not having been sufficiently dissimilar or engaging. Similar to Bennett et al.'s (2015) research, the content presented, especially in AV and R, was geared towards screening promotion rather than informed decision-making and might have been experienced as coercive advertising, which could have let participants to react against it.

The analysis of participants' comments helps to understand the lack of quantitative differences between the groups. The most notable aspect of these comments was their considerable similarity between the groups. In all conditions some women reported not having got any new information or intending to have Pap tests already. There were also participants in all conditions who had good things to say about the Pap test and some

participants appeared to find their experience with the study conducive to Pap test uptake in each condition, including NT.

The distinctions between the factual and attitudinal content are akin to those found in Bennett and colleagues' (2015) study. The attitude video appeared to reassure women and provide them with knowledge of what to expect from cervical screening, whereas the information video did make some women feel more informed and increased awareness—rather than providing reassurance. The reading material seemed to have a similar effect to the attitude video. This is unsurprising, as both include the same content; women in this group, however, appeared to relate to the case studies more so than women in the AV group.

Most importantly, though, the NT group also reported increased awareness and reassurance, which is consistent with the work of Ogden (2003) and Sandberg and Conner (2009) on the mere measurement effect. It suggests that the questionnaire items provided their own effect, as mentioned by some participants in this group.

Limitations. Nevertheless, apart from failing to recruit and retain a sufficiently large sample to determine the significance of small to moderate effects, certain aspects of the data prevent the certain conclusion that these non-significant results are due to the ineffectiveness of the interventions. Although the participants were randomly assigned to their conditions, R reported significantly fewer perceived benefits at pre-test than NT. This might have affected how much attitude and intention could improve in these groups immediately following the interventions. Similarly in the follow-up sample IV reported significantly more perceived benefits at pre-test than R, though this problem was solved by combining the intervention conditions.

The data are limited by a ceiling effect in pre-test intention. The median score of the entire sample was at the second highest point of the scale and even higher for AV, although there were no significant differences between the groups. It is unsurprising then that half of the sample would report no change in intention either immediately after the intervention or at follow-up. The distribution of intention change and the estimated marginal means plots show trends in the hypothesised direction. Although these trends could have been caused by demand characteristics, my findings contrast those of O'Brien and Lee (1990), who did not have to content with ceiling effects due to strong screening intentions at pre-test. This contrast suggests that the lack of effect in this study might be due to the ceiling effects.

Furthermore, the number of participants retained at follow-up was so small that non-significant test results are not unexpected considering the small effect sizes observed. Nevertheless, the tendency of the means from pre-test to follow-up were as predicted and further research is required to confirm the lack of an effect.

In addition, as the majority of the participants were 23 years old, most of the sample were as far from being eligible for cervical screening as was possible. This may have led to Pap test being less relevant to the sample than anticipated.

Open questions. The lack of reliable findings in this study does not render the underlying idea of testing the effect of attitude on screening intention any less worthwhile. This pilot is valuable in its ability to highlight issues which will need to be considered in a more extensive intervention study. The experiment confirmed that a no-treatment control group is essential to distinguish effects of the assessment from those of the intervention. It also suggests that the benefits of patient narratives and informed decision-making should be reflected upon in the design of future intervention material. Most importantly however—given the apparently frequently strong screening intentions in young women—a more targeted and elaborate recruitment strategy will be necessary to produce a sample of women with weak intentions for whom the tested interventions might be of any benefit at all. For example, future research might focus on young women living in the three Irish counties with the lowest (< 70%) screening participation: Kilkenny, Laois, and Roscommon (NCSP, n.d.-b). In the absence of higher education institutions in these areas, recruitment might occur in partnership with the Education and Training Boards in these counties, because they are likely to have young women among their students (Education and Training Boards Ireland, 2015). A more resource-intensive alternative would be a collaboration with professional market research company to recruit a large sample of women with weak screening intentions, similar to Waller, Jackowska, and colleagues (2012). Finally, the utility of the intervention would most benefit from a collaboration with the NCSP to recruit young, unscreened women and test the effectiveness of the intervention on their future screening behaviour.

Chapter 8

Discussion

The principal theme in the findings of the three studies presented here is the association of positive attitude with screening intentions and, possibly, screening attendance—in the absence of any association of information level with screening intentions or attendance. There is no published research in relation to cervical screening attendance that considers intuitive thinking, but my studies point to the value of influencing implicit affective attitude, probably in addition, rather than in favour of explicit cognitive attitude.

Conclusions from the systematic review. Previous systematic reviews (see Chapter 3) were of moderate to high quality and considered environmental and psycho-social associations with cervical screening attendance. The included reviews most commonly focused on screening promotion efforts, patient ethnicity, and information provision; meanwhile the most detailed evidence is available for socio-demographic correlates of Pap test attendance.

Comparatively few reviews focused on the influence of EVT constructs. One review (Shekelle et al., 1999) reported that interventions based on health beliefs appeared to be more successful at increasing screening attendance than non-theory-based interventions. The reviewed health beliefs, however, originated mostly in TRA/TPB and HBM. Intentions to have Pap tests do appear to affect attendance. In accordance with TRA/TPB, screening intentions were predicted by attitude, subjective norm and PBC. Among the control beliefs, PBC and HLoC were positively associated with attendance. The HBM constructs increased perceived susceptibility to cervical cancer, greater perceived benefits and lower perceived barriers were also associated with screening attendance; fear of abnormal Pap test results, however, was associated with avoidance. These findings may appear contradictory; however, women who feel susceptible to cervical cancer might attend screening to receive reassurance that they are healthy, whereas women who fear abnormal results could be afraid that they already have cervical abnormalities or cancer.

In addition there appears to be an overall strong correlation of high level of knowledge about the Pap test with screening attendance, though this association might

arise as a consequence of their Pap test uptake. In keeping with this argument, the evidence is less conclusive on the effect of educational campaigns, possibly due to the campaigns' varying quality. Educational interventions frequently used mass media, which appear to be most effective if they have visual appeal and engage active learning styles. In addition, high *perceived* levels of knowledge were associated with Pap test uptake. Feeling knowledgeable might reduce pre-screening anxiety and encourage uptake as a consequence.

The most frequently reviewed public promotions were patient invitations and reminders. These efforts appear to be effective, especially as women report forgetting to obtain Pap tests. Simultaneously, interactions with their health care providers and positive relationships with their smear takers appeared to correlate positively with attendance. Nevertheless, evidence from lay health worker interventions is inconclusive on the effect of increased social support for cervical screening.

The systematic reviews agreed that older women and those of lower SES were less likely to obtain Pap tests. The association with SES was significant using absolute measures, but also by measuring SES relative to the participants' neighbourhood, which suggests that socio-economic influences might interact with social or infrastructural factors. Similarly, ethnicity appeared to prevent Pap test uptake through socio-economic mechanisms that made ethnic minority women less likely to attend. Moreover, evidence on associations with fatalistic beliefs was inconclusive and, thus, failed to support cultural differences as a screening barrier. In addition, commonly reviewed access barriers were availability of Pap tests, cost, and time constraints. The reviews concluded that the evidence for these barriers is inconsistent. The mere removal of access barriers seems to increase screening attendance insufficiently. Several reviews suggested, however, that lacking access to a female smear taker was a significant barrier to attendance.

Although more frequent health care visits predicted greater likelihood of having Pap test, evidence for this correlation was lacking among disabled women, who more likely visit GPs out of need rather than motivation; and a general motivation to be healthy among non-disabled women might have created a spurious correlation with Pap test attendance.

These aspects provided a key perspective from which to interpret the focus group discussions in Chapter 5.

Focus group findings. The participants' discussions covered seven aspects that influenced their screening behaviour. Most importantly the focus groups provide examples of deliberate and experiential thinking to reach screening decisions. The focus groups suggested that the participants were torn between feeling obliged to have Pap tests and their expectations of psychological or physical discomfort. They, therefore, obtained Pap tests somewhat passively to ease the resulting attitudinal ambivalence.

In addition, the participants' knowledge of cervical screening was limited. Confidence that they could obtain a Pap test appears to be sufficient and their attitude towards Pap tests, evaluating them as worthwhile, appears to drive their screening decision. Although some ambiguity in their attitudes was apparent, negative evaluations of aspects of cervical screening could be changed by a better understanding of the matter, but the participants found health promotion ads unengaging and lacking a relevant context. This finding might elaborate on their lack of success in systematic reviews. Instead the participants preferred case-study based screening information. The women found case-studies more relatable than educational advertising and consequently paid better attention and retained more knowledge.

Furthermore, the focus group participants had difficulties relating to public educational advertising and this might explain the lack of effect of lay health worker interventions: a stranger providing factual information will be paid little attention. Instead the participants relied on family and friends for screening information. In accordance with the review findings, their closer social circles encouraged their screening attendance. Although the participants felt discouraged from Pap test attendance by society's apparently uninformed and stigmatising opinion of cervical screening, they found ways of excluding those parts of society from their social norm groups. For the focus group participants access to a female smear taker was as important as a trustworthy, experienced and sensitive smear taker. Supportive smear takers encouraged screening attendance for all women, but the systematic reviews suggest further that these characteristics could have particular significance for women with different cultural origins.

The focus groups also showed that personality traits like optimism, openness to experience, and neuroticism, which focuses on staying healthy, can encourage screening attendance. Although few psychological concepts featured in the reviews, similar health beliefs that could be identified were general health motivation, readiness to act, control beliefs, screening benefits and barriers, attitude, and subjective norm. The focus groups

thus support the argument that general health motivation will lead to other health protective behaviours, including frequent health care visits. The focus groups also agree with the review that readiness to action, and therefore susceptibility interventions, are most useful once possible actions are clear. This suggests educational interventions should focus on providing practical information about cervical screening. In addition, the focus group participants reported strong internal HLoC. Their desire for control over their health and for autonomy generated a sense of agency regarding their health care that resulted in Pap test uptake. Therefore, the primary benefit of cervical screening for these participants was reassurance a normal Pap test result provided. The participant's assumption that unscreened women lacked this agency and indulged their fears confirms this reading of their accounts.

Barriers reported by the focus groups appear similar to those identified in the review and by unscreened women (Waller, Jackowska et al., 2012). They agreed that cost and time constraints can create access barriers, though screening cost, thanks to the NCSP, was not a barrier for them. Similar to arguments in the review, the focus groups distinguished truly lacking time from unwillingness to make time for screening. In contrast, to the review findings, however, the focus group participants did not report lacking availability of cervical screening. Service provision appears to be a significant achievement of co-ordinated cervical cancer screening. Psychological barriers had a greater impact than access barriers, however. Nevertheless, the most important conclusion about barriers is that the screened focus group participants overcome their barriers, while unscreened women do not. For instance, psychological barriers included fear of pain or embarrassment during the test, and previous positive experiences of Pap tests, but also of other health care appointments, eased the participants' anxiety prior to subsequent Pap tests and thus enabled their attendance. In accordance with Fylan's (1998) review findings, the perception that she knows what to expect from a Pap test appointment appears to be the most important information.

Survey findings. Chapter 6 presented a cross-sectional study of current predictors of cervical screening attendance in Ireland. Multiple regression of intention found that attitude is an important predictor of cervical screening intention. Attitude explained nearly three times as much variance in intention as having had a previous Pap test and four times as much as having health insurance, which were further significant predictors in the final regression model. These results support the review's argument that EVT constructs are important for intervention research. In addition, moral obligation,

anticipated regret, perceived barriers, general health motivation, perceived benefit, extraversion and satisfaction with her smear taker were bivariately associated with screening intention. No measures of socio-demographics or knowledge of cervical screening were associated with intention.

Almost twice as many bivariate associations with uptake regularity emerged: stigma of sexual hygiene, having been invited for screening, occupation, satisfaction with her smear taker, age, intention, moral obligation, anticipated regret, perceived susceptibility, perceived benefit, perceived barriers, attitude, subjective norm and level of information about the Pap test. There is a considerable overlap in the associations of EVT variables with intention and regular attendance; while socio-demographic and knowledge measures did correlate with regular attendance, however, no personality measures appear to predict uptake. Furthermore, the multinomial regression identified perceived benefit, having been invited, intention, attitude, subjective norm, and mental health as significant predictors of regular rather than irregular uptake; and perceived barriers and age as significant predictors of regular compared to non-attendance. The association of younger women and Pap test avoidance is the inverse of the conclusion of the systematic review. Reviews suggest that all cervical cancer outcomes favoured younger women, especially those of reproductive age, over older women who might be uncertain whether they continue to require cervical screening following menopause. Irish women in their late twenties experience a high frequency of life changes, such as the transition from further education to employment, relocation for this purpose, and possibly change of employer. This means, firstly, that screening invitations might have been sent to an out-of-date address. Secondly, these changes require adjustments which may take priority over cervical screening at a critical time for the development of a screening habit. Older women are more likely to have focused on starting a family in young adulthood, which could have resulted in routine exposure to obstetric care and opportunistic, albeit repeated, cervical screening.

Cues to action were measured differently for screened and unscreened women and therefore excluded from the regression models. Although the systematic reviews found that face-to-face screening invitations and lay health worker interventions were less successful than other strategies, screened and unscreened women in the survey agreed that reminders from GPs and important others were among the most important cues to getting a Pap test. This suggests a personal element might improve screening promotion that relies on factual information provision. For screened women, invitations from the

NCSP were their most important cue, while promotional ads appeared to be least important. Unscreened women remembered some public and newspaper ads, but were much less likely to remember screening invitations from the NCSP, suggesting that these are insufficient at increasing attendance.

Overall, these findings suggest an explanatory pathway whereby positive attitude strengthens intention which results in screening attendance. An interaction analysis revealed that prior experience of screening moderated the relationship of positive attitude with intention strength. Thereby any increase in positive attitude was associated with a greater increase in intention strength for women who had never attended for cervical screening compared to those who had. Thus, attitudinal interventions might be best targeted at unscreened women rather than those who have failed to return for Pap tests.

Furthermore, intention to have a Pap test appeared to be entirely independent of information levels about cervical screening, and understanding of risk factors was associated neither with intention nor attendance. In accordance with the review, however, greater knowledge of the Pap test was predictive of screening attendance. Nevertheless, the association disappeared when EVT predictors were held constant. One systematic review (Fylan, 1998) pointed to the importance of perceived knowledge, but 50% of the survey sample felt they had insufficient knowledge of cervical cancer to make decisions about its prevention, despite the majority of the sample reporting previous screening attendance and strong intentions. Perceived knowledge of cervical cancer was not associated with either outcome variable, although, in the spirit of the principle of correspondence (Montaño & Kasprzyk, 2008), it could be perceived knowledge of the Pap test that influences decisions about attendance and actual uptake. Fylan's argument could therefore have relevance to an Irish population.

Experimental findings. The different intervention strategies tested in Chapter 7 led to no significant changes in attitude, intention, perceived benefit or barriers between conditions. Accordingly, participants from all groups commented that their intentions had not changed following the intervention or that the material had provided no new information. A ceiling effect in pre-test intention could have exacerbated this problem. Many participants reported that they had already intended to obtain Pap test prior to the study.

Nevertheless, the overall medians of change in attitude and intention indicate mildly more positive attitude and somewhat stronger intentions at post-test. Similarly, although

non-significant, the follow-up scores show trends towards more positive attitude and stronger intention. Comments suggested that the attitude video provided reassurance, and participants knew what to expect at their appointment following the intervention, while the information video appeared to raise awareness and increase knowledge. Similar to the focus groups, participants in the reading condition found the personal stories particularly relatable. The inferential statistics simply might have been underpowered for these trends to reach significance, due to small sample sizes.

Comments from the no-treatment group, however, suggest that the data collection questionnaire had had an effect similar to that expected of the treatment conditions. These women reported increased awareness and reassurance following participation, which might be caused by a mere measurement effect: rating their emotions and thoughts about cervical screening might have provided all participants with an otherwise unusual opportunity to reflect on cervical screening. The content analysis of participants' comments further found considerable overlap in the themes which suggests that the interventions were insufficiently distinct to produce different effects on attitude or intention; the participant might have processed them in similar ways.

In the review, education campaigns were found to be less effective than other strategies, like patient reminders, lay health workers or access enhancing interventions. Our review provides no evidence of within-sample comparisons of attitudinal and educational interventions. Similar research to increase the uptake of bowel cancer screening, however, found that personal accounts of screening can affect health beliefs and intention to complete FOBt (McGregor et al., 2015). This disagreement in findings suggests that the null-findings of the presented intervention are most likely caused by the study's limitations.

Contribution to knowledge

This research is the first to investigate the predictors of participation in the NCSP. The focus group interviews (Chapter 5) took place at the end of the NCSP's first completed three-year interval as the NCSP reached its 60 percent target for this screening round. The survey (Chapter 6) took place during the second three-year interval when the NCSP aimed to achieve 80 percent attendance. This target continues to be an ambitious goal and my conclusions about the influences on screening attendance can help meet it.

Previous Irish research, as described in the introduction, examined attendance at the ICSP, a regional pilot of the cervical screening programme. Interview studies of participation in the pilot have explored women's views and screening experience, but these were unconnected to cross-sectional studies of the ICSP. Based on the behaviour change literature, the cross-sectional research focused on socio-demographic predictors (Walsh, Silles, & O'Neill, 2010) and the application of EVTs to ICSP participation (Walsh, 2005, 2006; Walsh, O'Reilly, & Tracey, 2003). In contrast, my research, took an inclusive approach: I consulted both existing research evidence, in the systematic review (Chapter 3) and Irish women's experiences, through focus groups to identify potentially relevant predictors of cervical screening in Ireland. Inclusivity was particularly important given the unique sensitivity with which Irish society regards reproductive health care (Inglis, 2005).

In line with previous Irish studies, however, my research indicates that Irish culture appears to impact screening attendance less so than predictors previously associated with cervical screening intention and attendance, such as attitude, perceived benefit, and perceived barriers (Bish, Sutton, & Golombok, 2000; Hennig & Knowles, 1990; Savage & Clarke, 2001). Nevertheless, my research leads to synergistic conclusions that point to the influence of implicit attitude on screening decisions, beyond factual information, on which the NCSP's promotional campaign currently relies. Intuitive decision-making is an emerging field in the study of health behaviour and warrants further exploration in relation to cervical screening behaviour. The intervention pilot in Chapter 7 tested one strategy to affect implicit attitudes, and thus screening intentions, through screening narratives that were derived from the focus group data that initially indicated the utility of such narratives.

Limitations

Each of the studies in this project is limited by some methodological considerations. Most importantly, the overlap of EVT constructs and lack of clear definitions for each of them inhibits their reliable and valid measurement (Eagley & Chaiken, 2007). This might explain the lacking consensus among reviewers over the association of EVT constructs with cervical screening attendance; this situation also generates doubt about whether primary research findings would be consistent using other proposed measures of EVT constructs. Additional research is required to establish universal definitions of EVT constructs and validate tools to assess these.

Furthermore, to summarise the empirical literature on cervical screening attendance in a review of reviews is to accept greater emphasis on a particular set of primary studies which might have featured in several reviews increasing the perceived extent of the evidence. Therefore, greater consensus should not be seen as stronger evidence, but as a clear body of research on which multiple independent reviewers were able to agree. In addition, we synthesised previous reviews at the expense of yet-to-be-reviewed primary research that may well fill the gaps identified in our review. The findings in the subsequent research chapters suggest, however, that the scope of the review (Chapter 4) was sufficiently broad to provide those findings with an empirical context. Moreover, it continues to appear more sensible to compare my empirical findings to previous research of similar context or design in each chapter—rather than to provide a vast and unwieldy a priori summary of the 4075 research articles initially identified for the review.

Our review could include 25 systematic reviews, although thousands of articles have reported primary research of influences on cervical screening attendance. The strict criteria we used to define systematic reviews might have reduced the number of included studies drastically. Prior to the application of those criteria 77 articles were identified for full-text screening, however, which is also a comparatively small number of studies and suggests a lack in review activity. Particular areas on which new reviews might focus concern associations of Pap test uptake with personality, with cervical cancer risk factors, and the role of EVTs in uptake mechanisms. Arguably, little can be changed about personality to increase Pap test attendance. More conclusive evidence on personality and risk factors is useful, however, in targeting interventions using more malleable influences. Meanwhile EVTs may be unattractive to reviewers, because the assessment of EVT variables in primary studies is frequently inadequate and inconsistent across studies, which impedes comparisons or meta-analysis.

During the primary research the project lacked unscreened women in the focus group and survey samples. The difficulties in recruiting even 13 women for the focus groups suggest that cervical screening is not a popular subject. The participants supported this view. Unscreened women might therefore feel embarrassed talking about cervical screening at all, or guilty about their non-attendance. It would be normal to avoid those affects by avoiding participation in focus group discussions about cervical screening. Ethically sound methods of recruiting women under such conditions are limited and resource intensive; yet comparative research of screened and unscreened women has shown that they report similar psychological barriers to screening

attendance (Waller et al., 2009). Although the study of the magnitude of screening influences might be critically affected by the number of unscreened women, an audit of the range of influences which exist may nevertheless be quite accurate. A case in point are the access barriers mentioned by focus group participants, although they faced few access issues.

In the survey fewer unscreened women reduced the reliability of the multinomial regression findings, because the participants were unevenly distributed across the outcome measure. Some counter-intuitive findings that have been suggested to be statistical artefacts would confirm this concern. Yet it is hard to tell which of the apparently more logical findings might not be artefacts also. Although the multiple regression model is less affected by case distribution, the lack of variation in intention scores means the regression model is likely to predict strong screening intention. Even though the model appears to predict the majority of cases correctly, in my data that success could be due to most cases actually reporting strong intentions. Unscreened women and those with negative attitudes, greater perceived barriers and low quality smear takers were most likely to leave the survey early. Nevertheless, the fact that any unscreened women took part in the survey suggests that this design is more agreeable to non-screeners, but participation might still generate guilt in unscreened women and cognitive dissonance in those who question the value of cervical screening.

Although the age restriction in the intervention study eased the recruitment of unscreened women, the experiment suffered from a lack of participants. Trends in the data were in the hypothesised direction, though the study appears underpowered to detect significant smaller effects. A ceiling effect observed in pre-test intention, however, allowed only for small effects of the intervention. The overall median score approached the scale maximum and even reached the maximum for the AV condition, the primary experimental group. While continued recruitment might have solved these issues, as in the previous studies, people who value cervical screening will be more likely to take part in this study—and will also be more likely to intend to have a Pap test in the future—the cognitive dissonance argument equally applies to the intervention study.

Recruitment for all three studies excluded women who might have experienced organised cervical screening while living abroad or who might have been socialised in different cultures before they lived in Ireland. Both experiences might have impacted these women's health beliefs. The review evidence showed that the screening behaviour of ethnic minorities could be influenced by their distinct socio-demographic

characteristics, but also by culture-specific beliefs. While my findings of the influence of socio-demographic characteristics on Pap test uptake will apply as much to the Irish majority population as to women of foreign origin, my research failed to assess culture-specific beliefs of ethnic minority women. The EVTs, which I wished to examine in this project, however, equally exclude culture-specific beliefs, which therefore had to be controlled: either by exclusion of parts of the population who might hold them or by their careful assessment. As concluded in the systematic review, however, consensus of such assessment has yet to be reached; and the diversity of such beliefs precludes any comprehensiveness in a concise manner. Exclusion was therefore the most practical approach.

Moreover, many of the focus group participants were health care professionals. Their work might have affected the findings through their greater knowledge of Pap tests or could have overestimated the role of general health motivation in screening attendance. Qualitative research is not concerned about representativeness, and compared to previous qualitative research (Blomberg et al., 2008; Blomberg, Tishelman et al., 2011; Blomberg, Widmark et al., 2011; Bowe, 2004; Forss et al., 2001; Waller, Jackowska, et al., 2012), the focus groups did reveal a spectrum of influences. It is unsurprising that people who take sufficient interest in health to volunteer to discuss an embarrassing topic would also be likely to work in the health sector, but their professions do not appear to have influenced the focus groups significantly.

Although the focus group analysis picked up on some evidence of irrational decision-making and automatic Pap test attendance, the interview design encourages hindsight explanations congruent with the participants' behaviour (Waller, Jackowska, et al., 2012). Although Waller, Jackowska, and colleagues (2012) suggest population-based surveying as more suitable to avoid hindsight explanations, no self-report design can entirely avoid this problem. Esoteric elicitation methods that claim to access non-conscious drives of behaviour, however, have difficulty in demonstrating scientific rigour equal to that of more commonly used designs (Brunel, Tietje & Greenwald, 2004).

Furthermore, the regression analyses in the survey suggested health beliefs as the best predictors of screening intention and behaviour, but cross-sectional research cannot distinguish causal from non-causal associations, and so the relationship of cervical screening behaviours with health beliefs remains unclear. The bivariate association of levels of information about the Pap test and screening behaviour might be also non-causal. Regular screeners were found to be more knowledgeable about the Pap test than

unscreened women, but to be as knowledgeable as irregular screeners. Screened women might acquire knowledge about the Pap test through their attendance, rather than having knowledge that led them to attend. Women with screening-conducive health beliefs might also be more knowledgeable about screening. This argument explains the non-significant predictive effect of knowledge when health beliefs were entered into multinomial regression. It is more difficult to disentangle, however, whether better information lead to stronger conducive health beliefs that lead to screening attendance, or whether conducive health beliefs cause screening attendance *and* better retention of information about the Pap test.

Finally, any encouraging conclusions from the intervention have to be considered in the light of high demand characteristics and social desirability, which were impossible to avoid. The sample was highly educated and any moderately scientifically aware participants could have seen past any effort at deception. From an ethical perspective it is also questionable whether the benefits of conducting this study successfully would have outweighed ramifications of using deception. In addition, had the intervention been successful through the use of deception, no public health campaign would deceive the population of the purpose their intervention strategy, and therefore deception would have jeopardised the ecological validity of the study.

Implications for the literature

As a whole, this project supports the ideas put forward by EVTs in Chapter 4. Concepts from TRA/TPB (Ajzen, 2002) and HBM (Rosenstock, 1966) were identified in the focus group accounts; especially attitude, perceived benefits and barriers had prominence throughout the project. These concepts might have a common basis in outcome expectancies however (Weinstein, 1993), and the findings, thus, lend some support to SCT and HAPA also.

Most important, however, was the role of intention. Strong intentions to obtain Pap tests were common among the participants of all three studies. In the focus groups intentions to have Pap test failed to weaken in the presence of screening barriers or partly negative attitudes to screening. Similarly, perceived barriers failed to predict intentions in the survey when attitude was regressed simultaneously. Bivariately, barriers did correlate with both, intention and attitude; yet, the survey did not find a significant mediation among these variables. In addition, past attendance predicted strong intention; in reverse, however, weak intentions were predictive only of irregular

compared to regular attendance, rather than non-attendance. These findings might support concerns about the intention-behaviour gap (Sutton, 1998; Sutton, 2003). The differential association of intention and attendance might also suggest that a stronger volitional phase (Norman & Conner, 2005), e.g. more elaborate action planning (Schwarzer, 2008a, 2008b), is necessary to increase Pap test uptake among non-screeners.

Nevertheless, while our systematic review (Chapter 3) could not identify applications of dual-process models to cervical screening attendance, the three empirical studies indicate that intuitive thought has a role in cervical screening decisions. The definitions of the EVT constructs used in the empirical chapters show that these can be divided into those based on rational information processing, e.g. PBC, subjective norm, barrier, benefits, or readiness to action (Allahverdipour & Emami, 2008; Bish et al., 2000; Hennig & Knowles, 1990; Hill & Gick, 2011; Kahn et al., 2003; Walsh, 2006) and those based on intuitive thought. For instance, affective attitude and anticipated regret (Bish et al.; Sandberg & Conner, 2009) are based on emotional reactions by definition; Whynes and colleagues (2007) describe moral obligation as a sentiment, and Hennig and Knowles (1990) derive their definition of general health motivation from Becker and colleagues (1974, p. 207): "'Motivations' refers to differential emotional arousal in individuals caused by [health matters]".

The use of both these pathways was apparent in the focus groups which supported EVT concepts such as perceived barriers and benefit, readiness to action, desire to have control over their health, and subjective norms, but their attitude, anticipated regret and motivation to be healthy featured equally prominently in their accounts. Although being knowledgeable about cervical screening was also important to the participants, they were unwilling to attend to and process traditional education campaigns available in Ireland. Evidencing dual-processing the participant preferred information delivery through personal stories like Jade Goody's. The participants agreed on, but also discounted the value of, screening benefits; they had attended for Pap test, however, despite this discounting. Rather than deliberating on lacking benefits, they reported attending for Pap tests automatically when invited.

The survey further supports both TRA/TPB and HBM. While attitudes appeared to be the best predictor of intention; perceived barriers and benefit of HBM as well as attitude, subjective norm of TRA/TPB appeared to predict screening behaviour in addition to intention, age and having been invited for a Pap test. This evidence

supports the rationale of EVTs, but the survey indicates that attitude, based on affective reasoning, is of greater importance than understanding of cervical screening. The lack of significance of other affective predictors in the multivariate analyses is likely to be due to collinearity with attitude. In fact the survey findings illustrate the primary issue identified in the literature on EVTs: significant correlations of perceived barriers, benefits, anticipated regret, moral obligation and general health motivation with attitude exemplify the need for clearer delineation of EVT constructs.

Unfortunately, the intervention findings support neither factual nor inter-personal information provision as the mechanism of intention formation. These findings might stem as much from a lack of effect as from the methodological realities of the studies. Little can be said, therefore, about the intervention in relation to health behaviour theories.

New knowledge about cervical screening in Ireland

Women in Ireland appear to have good access to cervical screening since the nationwide introduction of the NCSP. The programme's organised invitation of the targeted population appears to be important for women's continued screening attendance. Yet, unscreened women appear less able to recall receiving cervical screening invitations and might need additional encouragement to obtain Pap tests.

Despite a lack of understanding of cervical cancer prevention, Irish women value Pap tests, obtain them and report strong intentions to continue to attend in the future. It would be interesting to know the basis of this perceived value and how it can be generated in women with negative attitudes to cervical screening. Greater knowledge of cervical screening does not appear to affect intention—or attendance, when psychological influences are also considered. This contrasts Walsh's (2006) conclusion that educational campaigns could raise awareness, improve women's understanding of screening, and lower anxiety. Yet Bowe (2004) reports lacking information among screened and unscreened women, their desire for more practical information, and their frustration with the available information material, suggesting that there is a need for different information provision strategies.

Irish cervical screening promotion currently relies on education campaigns (Walsh et al., 2010). It would be irresponsible to abandon information provision, but the previous (Bowe, 2004) and present interview research suggests that the focus of education campaigns and the mode of their delivery should move to practical information

provided by a relatable role model. This role model will increase knowledge, but can also associate positive affect with the opportunity to obtain a Pap test, which appears to strengthen intentions to participate in cancer screening (McGregor et al., 2015). Participant comments from the intervention study support this idea. The survey findings suggest that stronger intentions will be particularly useful to encourage sustained screening attendance throughout the targeted age range.

Unscreened Irish women, in turn, appear to experience greater barriers to screening than screened women. This finding concurs with previous Irish research (Walsh et al., 2003), which associated greater time constraints, less availability of screening, and male smear takers with screening avoidance. The present survey assessed access barriers alongside psychological barriers. While Waller and colleagues (2009) found access barriers, rather than psychological barriers to predict screening avoidance, Walsh (2006) found a combination of psychological and access barriers predicted non-attendance. The screened focus group participants did report psychological barriers and discounted access barriers, in accordance with Waller and collaborators, and also Walsh and co-workers (2003). An explicit investigation of the influence of specific barriers is required to better target future screening promotion.

My survey also supports Walsh and colleagues' (2003) bivariate finding that younger women are less like to obtain a Pap test; both studies oppose the review findings in this respect. The number of unscreened women in my survey, however, makes this finding more of an indication. The much younger sample of the intervention study reported considerable awareness, at least, of cervical screening. Additional research is required to confirm this unusual association of screening attendance with age in Ireland.

Walsh and co-workers' (2003) cross-sectional research found attitude to be less predictive of intention than in the presented survey. Instead intention was predicted primarily by PBC, followed by anticipated regret and subjective norm. In my survey the amount of variance explained by these constructs might have depended on the proportion explained by attitude, which correlated with PBC, anticipated regret and subjective norm. This is particularly likely in the case of anticipated regret: the four general dichotomies which make up Sandberg and Conner's (2009) attitude scale invite an intuitive interpretation that relies on emotions associated with the Pap test (Epstein, 1994; Epstein et al., 1996; Kahneman, 2011). Thus anticipated regret is likely to have influenced attitude scores which would link the variance explained by these two variables.

Instead, the variance in screening intention was explained further by insurance status and having had a previous Pap test. Walsh and co-authors (2003) report that 89% of their sample had private health insurance or a medical card, but do not examine any association with intention. Their investigation of previous experience with cervical screening distinguishes women who have had a Pap test within the past year, within the past three years, and those who have never had a Pap test, which includes those who had a Pap test more than three years ago. The differing group definitions make our findings difficult to compare. In Walsh and collaborators' (2003) sample intention was significantly stronger in unscreened women compared to those who had a Pap test within the previous year, but not compared to those who had a Pap test within the previous three years. Their findings suggest that women who had a Pap test most recently were, correctly, disinclined to re-attend immediately. In contrast, the present survey indicates that unscreened women and those who attend regularly have equally strong intentions to follow their next invitation; whereas women who are overdue have weaker intentions than regular screeners. Walsh et al.'s (2003) conclusions would concur with the present findings, if my sample of regular screeners contained a large proportion of women who had Pap tests more than 1 year prior to completing the survey. If these women report stronger intentions to have a Pap test, they might also have been more likely to respond to my recruitment efforts.

Conclusions

> The claim that 'we already know this' belies the uncertainty of scientific evidence. (Open Science Collaboration, 2015, p. aac4716-7)

The Open Science Collaboration recently completed their first inquiry into the replicability of psychological research. While they had moderate success in reproducing findings from cognitive research, they found the replication of social psychological studies more difficult. Rather than conclude that previous research has failed scientific standards in order to achieve publishable results, they argue that results of even near identical studies can differ as the societies from whom samples are drawn develop and change over the intervening decades. In light of this argument, this project's conclusions that attitude predicts intention to attend for a Pap test which in turn might predict regular attendance is an important contribution to social psychology applied to health, despite meaning that

a) influences on Irish cervical screening attendance are largely similar to those identified in populations across the world,
b) influences on Irish cervical screening attendance which have seen the greatest change since the three-county pilot of the NCSP are of a structural rather than psychological nature, and
c) influences on Irish cervical screening attendance confirm rather than contradict traditional EVTs.

It suggests that

a) interventions which will increase Pap test uptake in other countries might well have success in Ireland,
b) the NCSP achieved increased access, but has yet to reach non-attenders, and
c) EVTs successfully predict attendance in ways that can be explained rationally.

Nevertheless, this project informs one of the frontiers of health behaviour research: automaticity and intuitive thought appear to influence cervical screening attendance in addition to deliberative decision-making. Research that has investigated these ideas in relation to Pap test uptake has not been published. Applications to screening for other cancers (Bennett et al., 2015; McGregor et al., 2015) agree with my findings, which suggests that cancer prevention will benefit from a better understanding of intuitive decision-making, its interplay with rational thought, and its role in a society that emphasises informed choice.

Opportunities for further research

Future research needs to establish to what extent my findings and conclusion apply to women of foreign origin or those with culturally diverse beliefs. Culture-specific beliefs, like fatalism, might impact on the strength of health beliefs, like perceived risk or locus of control; or cultural diversity might impact through a differing understanding of illness and health care.

In addition, as a feasibility study, my intervention highlights several issues that similar larger trials should consider. The study showed that a no-treatment control group is essential to control for any mere measurement effects of pre- and post-assessments.

Given the strong pre-test intentions in my sample, the study emphasises the need for targeted sampling of non-attenders with negative attitude or weak screening intentions. Research with such a sample might not create a realistic exposure pattern for a public health campaign, but will be better able to answer theoretical questions. For instance, a sample with scope for change towards more positive Pap test attitude can help identify reliable strategies to induce positive attitude, which is the foundation for gaining a better understanding of the apparently reciprocal relationship of attitude, intention and behaviour. A sample more similar to mine is more helpful to establishing the effect of a public health campaign in a real-world setting, in which women with positive and negative attitudes, weak and strong intentions might be equally exposed to the intervention.

While the participants' comments on the interventions might help to improve these strategies, further work is required to better understand the mechanisms by which EVT constructs might cause screening attendance. In order to complete this research, however, universal definitions and clearer separation of EVT constructs are needed (Michie, 2015). In my survey, positive attitude to cervical screening appears to be important for strong intention, and screening behaviour was also associated with intention, suggesting an indirect effect of attitude on screening behaviour as proposed by TRA/TPB (Ajzen, 2002). Additionally, perceived benefits and barriers were associated with screening behaviour. All of these concepts were correlated and reacted similarly in the intervention. These findings support Weinstein's (1993) argument that barriers, benefits and attitudes have a common denominator in outcome expectancies, but it remains uncertain how the identified health beliefs relate to each other.

Moreover, dual-process models are increasingly gaining importance in behaviour change research. In respect of this project, especially the role of attitudes in dual-process models needs to be better understood. Kahneman (2011) describes how fast, intuitive thought will create liking based on the ease with which new information can be processed. Such liking is turned into positive attitude when more deliberative thought confirms the initial reaction. He also explains, however, that existing attitude will drive beliefs about the attitude object, such perceived cost and benefits, and will guide information seeking towards confirmatory rather than contradictory information. Although attitude is important for Kahneman's (2011) argument, rather than explicate his definition of the term, he works from an intuitive understanding, as criticised by Smedslund (2000).

The study of implicit attitudes to cervical screening might provide a better understanding of the role of intuitive decision-making in Pap test uptake. The implicit association test could indicate the extent to which women can accurately report their non-conscious associations with, or implicit attitudes towards, cervical screening (Briñol & Petty, 2006). This knowledge might help future survey and intervention designs: traditional questionnaire measures would be unhelpful, if women were unable to report their intuitive responses accurately.

Finally, the emergence of dual-process models has generated debate over whether persuasion through intuitive thought should replace informed decision-making over health matters. My focus group participants provide an excellent example when they advocate that health education advertising should combine reassuring information about cervical screening with persuasive strategies. This suggestion opposes the NCSP (2011a) who emphasise informed decision-making and patient self-determination. Yet, the focus group participants appear to be content to obtain Pap tests with less understanding of cervical cancer prevention than the NCSP (2011a) deems sufficient for informed choices, e.g. the focus group seemed much less concerned by false abnormal results. Everett and co-authors (2011) argue that informed uptake is particularly valuable in light of media coverage of cancer sufferers, like Jade Goody, which might induce women to obtain Pap tests impulsively rather than after deliberating their necessity. Nevertheless, commercial advertising uses persuasive strategies and invests great effort in improving persuasive skill in a culture of public acceptance of this manipulation of people's behaviour. While Everett and collaborators found no trials examining informed consent to cervical screening, research in England (von Wagner et al., 2012; Waller, Macedo, et al., 2012) found that over 80% of patients trust their GPs' recommendations of cancer screening tests. Yet most of these patients also want to be fully informed about the risk and benefits of cancer screening tests. The authors (von Wagner et al., 2012; Waller, Macedo, et al., 2012) conclude that patients are content to defer to an expert opinion in a culture of transparency.

Moreover, as current cervical screening education takes care to provide complete information about the costs and benefits of cervical screening, public health workers need to concern themselves more with impulsive invitation-ignorers than impulsive attenders. Studying persuasive mechanisms, rather than using them to increase attendance, would help to learn how to disrupt them when they encourage screening avoidance. Fear of abnormal results or of discomfort from the Pap test could be

affecting the behaviour of non-screeners at an intuitive level and therefore much faster than they can deliberate over the benefits of cancer prevention and early detection. In line with this argument findings from my survey suggest that providing screening information for informed decision-making might be futile for women with unfavourable attitudes towards cervical screening. Dual-process models would suggest that there is a need first to create willingness to process screening information. Instead screening information might enhance informed choices among women who already favour cervical screening and are willing to process information about it, and it is equally important that these women obtain Pap tests with an accurate understanding.

Furthermore, dual-process models might indicate how comprehensive screening information can be provided such that it will be retained by patients. Narrative as opposed to news-reader formats have been shown to effectively strengthen colorectal screening intentions, were preferred by my focus group participants and provided reassurance, but also knowledge, to participants in my intervention. Although typically used to recommend cancer screening, narratives are just as capable to provide balanced information, including the risks of having a Pap test.. Future research could use a replication of the intervention in Chapter 7 to investigate the effects of including narrative risk information on knowledge of cervical screening, attitude, intentions, and Pap test uptake

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APPENDIX A

3. Who attends for a Pap test? A systematic review of influences on cervical screening uptake

Data collection

Version: 13/03/14 JM or MK (circle) *date of extraction:* _____

Data Extraction Tool
"Who attends for a Pap test?"

Citation:		SR or MA (circle)
Include/ Exclude (circle as appropriate)		
Reports search terms	Yes	No
Lists databases searched	Yes	No
Explicit inclusion criteria	Yes	No
Part or all of study population are eligible female patients	Yes	No
All of study population are physicians or organisations	Yes	No
Reviewed studies used at least cross-sectional designs	Yes	No
Reviewed studies include systematic reviews	Yes	No
Part or all of studied outcomes are Pap test attendance	Yes	No
Results present separate analysis for Pap test attendance of eligible female patients in at least cross-sectional designs	Yes	No
Notes (incl. sources of info; e.g. article [use citations if >1 article report on study], pers. commu. etc.)		
No of databases searched: Publ. years incl: Languages incl: No of studies in review: N (total sample): Countries: Total age range: Ethnicity of sample: Designs of studies included: Def. of outcome measure: How was info collected?		
Definitions & operationalisations of IVs:		
Remarks (key conclusions, important comments by authors, conflicts of interest—if any)		

Figure 3.1. Data extraction tool.

Table 3.1
Record of Review Findings

Predictor	Associated with attendance	Associated with avoidance	No association	Inconclusive evidence	Insufficient/ no evidence
Health beliefs					
Intention	Cooke & French, 2008				
PBC	Cooke & French, 2008				
Locus of control	Fylan, 1998				
Perceived susceptibility	Fylan 1998 Edwards et al., 2008			Everett et al., 2011	Albada et al., 2009
Perceived barriers		Bukowska-Durawa & Luszczynska, 2014		Everett et al., 2011	
Perceived benefits	Fylan 1998 Yabroff et al, 2005				
Stage of adoption					Albada et al., 2009
Fear of abnormal result		Yabroff et al., 2005			
Pain/ discomfort		Fylan, 1998 Yabroff et al., 2005			
Embarrassment		Fylan 1998 Yabroff et al., 2005			
Perceived lack of necessity of Pap test		Fylan, 1998			

Table 3.1
Record of Review Findings

Predictor	Associated with attendance	Associated with avoidance	No association	Inconclusive evidence	Insufficient/ no evidence
Social support in health matters	Han et al., 2011 Everett et al., 2011			Yabroff et al., 2003 Viswanathan et al., 2009	
Socio-demographics					
Age		Fylan, 1998 Newmann & Garner, 2005 Yabroff et al., 2005			
Education	Pruitt et al., 2009 Yabroff et al., 2005				
Homelessness				Newmann & Garner, 2005	
Health literacy	Newmann & Garner, 2005				
Income	Fylan 1998 Newmann & Garner, 2005 Yabroff et al, 2005			Pruitt et al., 2009	Shekelle et al., 1999/ Stone et al., 2002
Exist and type of health care coverage	Newmann & Garner 2005 Yabroff et al., 2005				Shekelle et al., 1999/ Stone et al., 2002

Table 3.1
Record of Review Findings

Predictor	Associated with attendance	Associated with avoidance	No association	Inconclusive evidence	Insufficient/ no evidence
Rural residence			Shekelle et al., 1999/ Stone et al., 2002	Yabroff et al., 2005	Newmann & Garner, 2005
Health behaviours and risk factors					
Regular health checks	Yabroff et al., 2005				
Health status	Wisdom et al., 2010 Newmann & Garner, 2005				
BMI		Cohen et al., 2008 (obesity)		Cohen et al., 2008 (underweight)	
Access issues					
Cost of test					Everett et al., 2011 Sabatino et al., 2012
Regular source of care	Yabroff et al., 2005				
Time constraints		Fylan, 1998 Yabroff et al., 2005			
Accessibility	Han et al., 2011 Yabroff et al., 2005				Sabatino et al., 2012
Female smear taker	Fylan 1998 Newmann & Garner, 2005				

Table 3.1
Record of Review Findings

Predictor	Associated with attendance	Associated with avoidance	No association	Inconclusive evidence	Insufficient/ no evidence
Ethnicity					
Culturally appropriate interventions	Han et al., 2011		Corcoran et al., 2012	Lu et al., 2012 Yabroff et al., 2003	
Proficiency in first language of the country (commonly English)	Fylan, 1998 (SR) Newmann & Garner, 2005 Yabroff et al., 2005				
Foreign origin		Fylan 1998 Norredam et al., 2010		Yabroff et al., 2005 Newmann & Garner, 2005	Shekelle et al., 1999/ Stone et al., 2002
Strong culture-specific beliefs		Fylan, 1998			
Fatalism				Espinosa de los Monteros & Gallo, 2011	
Acculturation	Yabroff et al., 2005				
Level of understanding					
Patient education	Fylan, 1998 Han et al., 2011 Lu et al., 2012 Shekelle et al., 1999/ Stone et al., 2002		Corcoran et al., 2012	Everett et al., 2011 Sabatino et al., 2012 Viswanathan et al., 2009 Yabroff et al., 2003	
Information level (Pap test)	Fylan 1998				

Table 3.1
Record of Review Findings

Predictor	Associated with attendance	Associated with avoidance	No association	Inconclusive evidence	Insufficient/ no evidence
Information level (cervical cancer)	Fylan 1998				
Information level (risk factors)	Fylan 1998				Albada et al., 2009
Perceived information level	Fylan, 1998				
Cervical screening promotion					
Physician recommendation	Yabroff et al, 2005				
Patient invitation	Everett et al., 2011 Ferroni et al., 2012 Pirkis et al., 1998				
Patient reminder	Ferroni et al., 2012 Sabatino et al., 2012 Shekelle et al., 1999/ Stone et al., 2002 Tseng et al., 2001 Yabroff et al., 2003			Kupets & Covens, 2001	Everett et al., 2011
Patient incentives	Shekelle et al., 1999/ Stone et al., 2002				Sabatino et al., 2012
Mass media interventions	Han et al., 2011		Corcoran et al., 2012 Lu et al., 2012	Everett et al., 2011 Shekelle et al., 1999/ Stone et al., 2002	Sabatino et al., 2012
Message framing			Everett et al., 2011		

Table 3.1
Record of Review Findings

Predictor	Associated with attendance	Associated with avoidance	No association	Inconclusive evidence	Insufficient/ no evidence
Small media	Baron, Rimer, Breslow et al., 2008				
Active learning strategies	Shekelle et al., 1999				
Visual appeal/ clarity	Shekelle et al., 1999				
Theory based	Shekelle et al., 1999				
Social influence		Shekelle et al., 1999			
Individual differences					
Forgetfulness		Yabroff et al., 2005			
Degree of heterosexual attraction	Newmann & Garner 2005				

Notes.

Table 3.2
Possible Quality Assessment Criteria

Criterion	CRD, 2008	Sanders & Kitcher, 2006	Oxman, 1994	Shea et al., 2006	Russell et al., 1998	Ellis et al., 2003
focused aim/ specific research question	✓	✓	✓	×	✓	×
thorough search for relevant studies	×	×	✓	×	×	×
specifies search terms/ strategy	✓	✓	×	✓	×	✓
reports details of databases searched	×	✓	×	✓	×	✓
followed up references in bibliographies	×	✓	×	×	✓	✓
hand searched articles	×	✓	×	×	✓	×
consulted experts for further sources	×	✓	×	×	✓	✓
searched grey literature	×	✓	×	×	✓	×
lists years searched	✓	×	×	×	×	×
not restricted to English language papers only/ reports language restrictions	✓	✓	×	×	×	×
unbiased selection of studies	×	×	×	✓	×	×
explicit inclusion/ exclusion criteria	✓	✓	✓	✓	×	✓
more than one reviewer	✓	×	×	×	✓	×
reports methods for selecting studies	×	✓	×	×	×	×
reports methods for extracting data	×	✓	×	×	×	×
reports sufficient detail about studies	✓	×	×	×	×	×
obtained missing data from investigators	×	×	✓	×	×	×
assesses quality of included studies	✓	✓	✓	✓	✓	✓
specifies quality criteria	×	✓	×	×	×	×
appropriate criteria to assess validity of included studies	×	×	×	✓	×	×
uses quality checklist, not scales	✓	×	×	×	×	×
quality assessments includes at least 3 of 6 (design, sample confounders, intervention, DV, follow-up)	×	×	×	×	×	✓

Table 3.2
Possible Quality Assessment Criteria

Criterion	CRD, 2008	Sanders & Kitcher, 2006	Oxman, 1994	Shea et al., 2006	Russell et al., 1998	Ellis et al., 2003
reports methods used to combine findings of relevant studies	×	×	×	✓	×	×
synthesises data to integrate results	✓	✓	✓	×	✓	✓
results of review sensitive to method of review	×	×	✓	×	×	×
subgroups analyses interpreted cautiously	×	×	✓	×	×	×
appropriate synthesis of findings relative to review question	×	×	×	✓	×	×
data support conclusions	✓	×	✓	✓	×	✓
explicates judgements of preference	×	×	×	×	×	×
distinguishes no evidence of effect from evidence of no effect	×	×	✓	×	×	×
overall quality rating of review (scale from 1 to 10)	×	×	×	✓	×	×

Note.

Version: 07/04/2014 JM or MK (circle) date: _____

Quality Assessment Checklist

Citation:			
	Yes	No	No record
focused aim/ specific research question			
specifies search terms/ strategy			
followed up references in bibliographies			
consulted experts for further sources			
assesses quality of included studies			
synthesises data to integrate results			
data support conclusions			

Figure 3.2. Quality Assessment Criteria

Study assessments

Table 3.3
Quality Assessment

Citation	focused aim/ research question	specifies search terms	followed up bibliographies	consulted experts for further sources	explicit inclusion criteria	quality assessment of included studies	synthesises data	data support conclusions
Albada, Ausems, Bensing, & van Dulmen (2009)	✓	✓	✓	✓	✓	✓	✓	✓
Baron, Rimer, Breslow et al. (2008)	✓	✓	✓	✓	✓	✓	✓	✓
Bukowska-Durawa & Luszczynska (2014)	✓		✓	✓	✓	✓	✓	✓
Cohen et al. (2008)	✓	✓	✓		✓		✓	✓
Cooke & French (2008)	✓	✓	✓	✓	✓		✓	✓
Corcoran et al. (2012)	✓	✓	✓	✓	✓	✓	✓	✓
Edwards et al. (2008)	✓	✓	✓	✓	✓	✓	✓	✓
Espinosa de los Monteros & Gallo (2011)	✓	✓	✓		✓			✓
Everett et al. (2011)	✓	✓	✓	✓	✓	✓	✓	✓
Ferroni et al. (2012)	✓	✓	✓		✓	✓	✓	✓
Fylan (1998)	✓	✓			✓		✓	✓
Han et al. (2011)	✓	✓	✓		✓	✓	✓	✓
Lu et al. (2012)	✓	✓	✓	✓	✓	✓	✓	✓
Kupets & Covens (2001)	✓	✓	✓		✓			✓
Newmann & Garner (2005)	✓	✓	✓				✓	✓
Norredam, Nielsen, & Krasnik (2010)	✓	✓	✓		✓		✓	✓
Pirkis et al. (1998)	✓	✓	✓		✓	✓	✓	✓
Pruitt, Shim, Mullen, Vernon, & Amick (2009)	✓	✓	✓	✓	✓		✓	✓

Table 3.3
Quality Assessment

Citation	focused aim/ research question	specifies search terms	followed up bibliographies	consulted experts for further sources	explicit inclusion criteria	quality assessment of included studies	synthesises data	data support conclusions
Stone et al. (2002)/ Shekelle et al. (1999)	✓	✓	✓		✓	✓	✓	✓
Tseng et al. (2001)	✓	✓	✓	✓	✓		✓	✓
Viswanathan et al. (2009)	✓	✓	✓	✓	✓	✓	✓	✓
Wisdom et al. (2010)	✓		✓		✓		✓	✓
Yabroff, Mangan, & Mandelblatt (2003)	✓	✓	✓		✓		✓	✓
Yabroff et al. (2005)	✓	✓	✓		✓		✓	✓

Notes.

Table 3.4
Study Details

Citation	Description
Albada et al. (2009)	– Systematic review – 5 databases searched, all publications until June 2007 – 3 studies, all from US, in English, published 1996 – 2003 – sample characteristics: N = 4178; mean ages 39 and 40 years, and aged 40 – 54 years – study designs are all experimental – outcome: post-test Pap test uptake according to self-report or medical record
Baron, Rimer, Breslow et al. (2008)	– systematic review – used 5 databases, searched all publications until November 2004, from countries with high income

Table 3.4
Study Details

Citation	Description
Baron, Rimer, Breslow et al. (2008) ctd.	economies only[a] (Baron, Rimer, Coates, Kerner, Mullen, et al., 2008) – includes 14 studies, but excludes 2 from evaluation due to poor quality, publication years 1982 – 2003, languages not reported, countries not reported, but authors consider results applicable to Australia and USA, review of studies conducted in more developed countries (Baron, Rimer, Coates, Kerner, Mullen et al., 2008) – sample characteristics: partial report of ethnicity, Hispanic, African-American, Caucasian, Vietnamese, Chinese; total N or age range not reported – study designs: experiments – outcome: post-test Pap test uptake assessed by chart review
Bukowska-Durawa & Luszczynska (2014)	– systematic review – searched 8 databases, 5 named in article, published until 2011, without language restrictions – include 43 studies: 5 experimental, 18 cross-sectional, and 20 excluded because no association with Pap test uptake tested, all studies published in English, conducted in Poland, Australia, Bulgaria, Romania, Mexico, Sweden and USA, between 1989 and 2011 – sample characteristics: N = 21571 for experiments, not reported for cross-sectional studies, age and ethnicity not reported – study designs: cross-sectional, RCTs, and controlled trials – outcome: Pap test uptake, no measures reported
Cohen et al. (2008)	– systematic review – 1 database searched, all publications until February 2007, English only – 14 studies included, conducted in USA, published between 1972 and 2006

Table 3.4
Study Details

Citation	Description
Cohen et al. (2008) ctd.	– sample characteristics: N = 228 424; age ≥ 18 years or age range 18 – 75 years; ethnicity reported partially as mostly Caucasian, some African-American – study designs: cross-sectional – outcome: Pap test uptake within past 1, 2, or 3 years; measured mostly by self-report, but also chart review
Cooke & French (2008)	– meta-analysis – searched 4 databases between 1981 and 2006, report no language restrictions – 4 studies included, from UK and Ireland, published between 2000 and 2006 – sample characteristics: N = 1013; age range (partial) 20-67 year – study designs: cross-sectional with bivariate analyses – outcomes: no definition for attendance; measured by self-report or medical records
Corcoran et al. (2012)	– meta-analysis – used 5 databases, searched until January 2009, report no language restrictions – includes 6 studies published in English between 1997 and 2005, from USA – sample characteristics: N = 2615; age ≥ 18 years; Hispanic – study designs: 2 experiments, 4 quasi-experiments – outcome definitions and outcome measures not reported
Edwards et al. (2008)	– meta-analysis – 7 databases searched from 1985 – 2005, report no language restrictions – 3 datasets (4 articles) from USA and Australia, published between 1996 and 2005, all in English – sample characteristics: N = 1991; aged 18 to 75 years – study designs are all RCTs – outcomes: post-test Pap test uptake; no measures reported

Table 3.4
Study Details

Citation	Description
Espinosa de los Monteros & Gallo (2011)	– systematic review – included 8 databases, articles published by 25th February 2010, in English & Spanish – 7 studies included, from USA, all published in English – sample characteristics: N = 7846; age range: 40 – 75 years, mean age range 38.5 – 49 years; ethnicities include Hispanic versus other – study designs are all cross-sectional – outcomes: life-time Pap test, Pap test within past 2, 3, or 5 years, prior to cervical cancer diagnosis, time since last Pap test; measured mostly by self-report
Everett et al. (2011)	– meta-analysis – 4 databases searched between 1966 and 2009, no language restrictions – includes 38 studies, published between 1987-2007, from USA (16), Australia (9), UK (7), Canada (2), Sweden (2), Italy (1), South Africa (1) – sample characteristics: N = 205288; age range 18 – 75 years or 18 years +; Asian, Hispanic, Caucasian, African (incomplete) – study designs are all RCTs – outcomes: post-test Pap test uptake measured by record review or self-report
Ferroni et al. (2012)	– meta-analysis – included 7 databases without language restrictions – 17 datasets (13 studies), published between 1989 and 2005, from Australia, Canada, Taiwan, UK, USA – sample characteristics: N = 20485; age range restricted to 25 – 64 years, but not reported – study designs are all experimental – outcomes definitions and outcome measures not reported

Table 3.4
Study Details

Citation	Description
Fylan (1998)	– systematic review – searched 1 database from 1982 – 1997, in English only – includes 21 studies, published between 1983 and 1997, does not report countries – does not report sample characteristics – does not report study designs – does not report outcome definitions or measures
Han et al. (2011)	– meta-analysis – used 4 databases, searched articles published between 1984 and 2009, in English only – includes 18 studies from USA, published from 1993 – 2007 – sample characteristics: N = 13407; African-American, Hispanic, Asian, Native American; age range not reported – study designs: experiments and quasi-experiments – outcomes: no definitions reported; measured by self-report or medical records
Kupets & Covens (2001)	– systematic review – 2 databases searched between 1996 and 2000, restricted to studies from North America and published in English – includes 5 studies, published between 1989 and 1997 – study designs are all RCTs – outcomes: post-test Pap test uptake; measures not reported
Lu et al. (2012)	– systematic review – 15 databases searched, published until 2010, no language restrictions – includes 18 studies, 12 about cervical screening, published in English and Chinese between 1994 and 2007, in USA, Taiwan, Thailand, Canada, New Zealand

Table 3.4
Study Details

Citation	Description
Lu et al., (2012) ctd.	– sample characterisitics: total N = 7189, of Asians and Asian emigrants, ages not reported – study designs: RCTs, prospective cohort studies, non-equivalent control groups – outcome: completion of Pap test, self-report or record review
Newmann & Garner (2005)	– systematic review – 1 database searched for publications from USA after 1990 – includes 19 studies: N and age range not reported; African American, Caucasian, Native American, Asian, Pacific Islanders – study designs not reported – outcome definitions and measures not reported
Norredam et al. (2010)	– systematic review – used 2 databases, publications from 1999 – 2009, studies from EU countries + Switzerland, Norway, Iceland, Lichtenstein – includes 2 studies from the Netherlands, UK and Spain, published in 2004 and 2005 – sample characteristics: N = 35064; age range 30 – 64 years; South Asians (ethnicities partially reported) – study designs: cross-sectional, longitudinal – outcomes measured by chart review, no definitions provided
Pirkis et al. (1998)	– meta-analysis – searched 2 databases for articles published before 1996 in English only – includes 6 studies from Australia, Canada, USA, UK, published 1988-1995 – sample characteristics: N = 17115; ethnicity and age range not reported – study designs: RCTs – outcomes: post-test Pap test uptake at 6 months or 12 months; measured as chart review, self- or GP-report (partially reported)

Table 3.4
Study Details

Citation	Description
Pruitt et al. (2009)	– systematic review – 6 databases searched until 2007, publications in English only – includes 8 studies published between 1998 and 2006, from Japan, Australia, USA – sample characteristics: N (partially reported) = 248995; aged 18 -75 years or ≥ 18 years; ethnicity incompletely reported as Asian, Caucasian, African American, Hispanic – study designs are all cross-sectional – outcomes: lifetime Pap test, within past year, 2 years, 3 years; measured by self-report or record review
Sabatino et al. (2012)	– systematic review – partly updates review by Baron, Rimer, Breslow et al. (2008), includes results in data synthesis – searched 5 databases from 2004 – 2008, original search until November 2004, both searched for studies published in countries with high income economies[1] (Baron, Rimer, Coates, Kerner, Mullen et al., 2008) – adds 18 studies to original 16 (Baron, Rimer, Breslow et al., 2008); published between 1989 – 2008; from USA, Sweden, Belgium, Australia, Canada, UK – sample characteristics: N not reported; ages not reported; African American, Hispanic, Asian, Asian American, Caucasian, Native American (ethnicities incomplete) – study designs are all experimental – outcomes: post-test Pap test uptake; measured by self-report or record review
Shekelle et al. (1999)/ Stone et al. (2002)	– meta-analysis – searched 3 databases for publications in English from 1968 until 1995/ used 2 databases until February 1999 – includes 25 studies; published between 1987 – 1998; majority from USA or 'other'; includes 33 datasets (N studies not reported)

Table 3.4
Study Details

Citation	Description
Shekelle et al. (1999)/ Stone et al. (2002) ctd.	– sample characteristics: N > 99779 (partially reported); majority aged < 65 years, incomplete reporting; Hispanic, African American (partial reporting)/ not reported – study designs: RCTs, clinical controlled trials, controlled before-and-after studies/ all RCTs – outcomes: post-test Pap test uptake, measures not reported
Tseng et al. (2001)	– meta-analysis – searched 2 databases from 1966 – 2000 – includes 10 studies; published between 1989 – 1999; in English; from USA, Australia, Canada, UK – sample characteristics: N = 20812; aged 18 – 74 years; ethnicities not reported – study designs are all RCTs – outcomes: post-test Pap test uptake, measured as record review, self-report, practitioner report
Viswanathan et al. (2009)	– systematic review – searched 3 databases, published in English, from USA only, from 1980 onwards – includes 6 datasets (10 articles) published from 1992 – 2008 – sample characteristics: N = 4366; aged 18 – 97 years or mean age 45.2 years; Asian-American, African-American, Hispanic – study designs: experimental, quasi-experimental, prospective, retrospective – outcomes: post-test Pap test uptake with 1 or 2 year follow-up, lifetime Pap test, uptake in past year or 3 years; measured by self-report
Wisdom et al. (2010)	– systematic review – used 1 database, searched publications in English only from 1990 – 2005 – includes 6 studies published between 1998 and 2004 – sample characteristics: older than 19 years – study designs: not reported – outcomes: lifetime Pap test, recent Pap test, Pap test within past year; no measures reported

Table 3.4
Study Details

Citation	Description
Yabroff et al. (2005)	– systematic review – searched 1 database from 1966 – 2002, for studies from US, published in English only – includes 28 studies; published between 1990 and 2002 – no sample characteristics reported – no study designs reported – outcomes: not operationalised, measured by self-report or chart review
Yabroff et al. (2003)	– systematic review – 1 database searched from 1980 – 2002, for studies from US, published in English only – includes 24 studies; published between 1990 and 2001 – sample characteristics: N = 25150; majority aged 50 to 59 years or < 40 years; African-American, Hispanic, Asian, Native American, Caucasian – study designs are all experimental – outcomes: post-test Pap test uptake, measured as self-report or record review

Notes. [a]as defined by the World Bank.

APPENDIX B

4. Theories of health behaviour and behaviour change:

A discussion

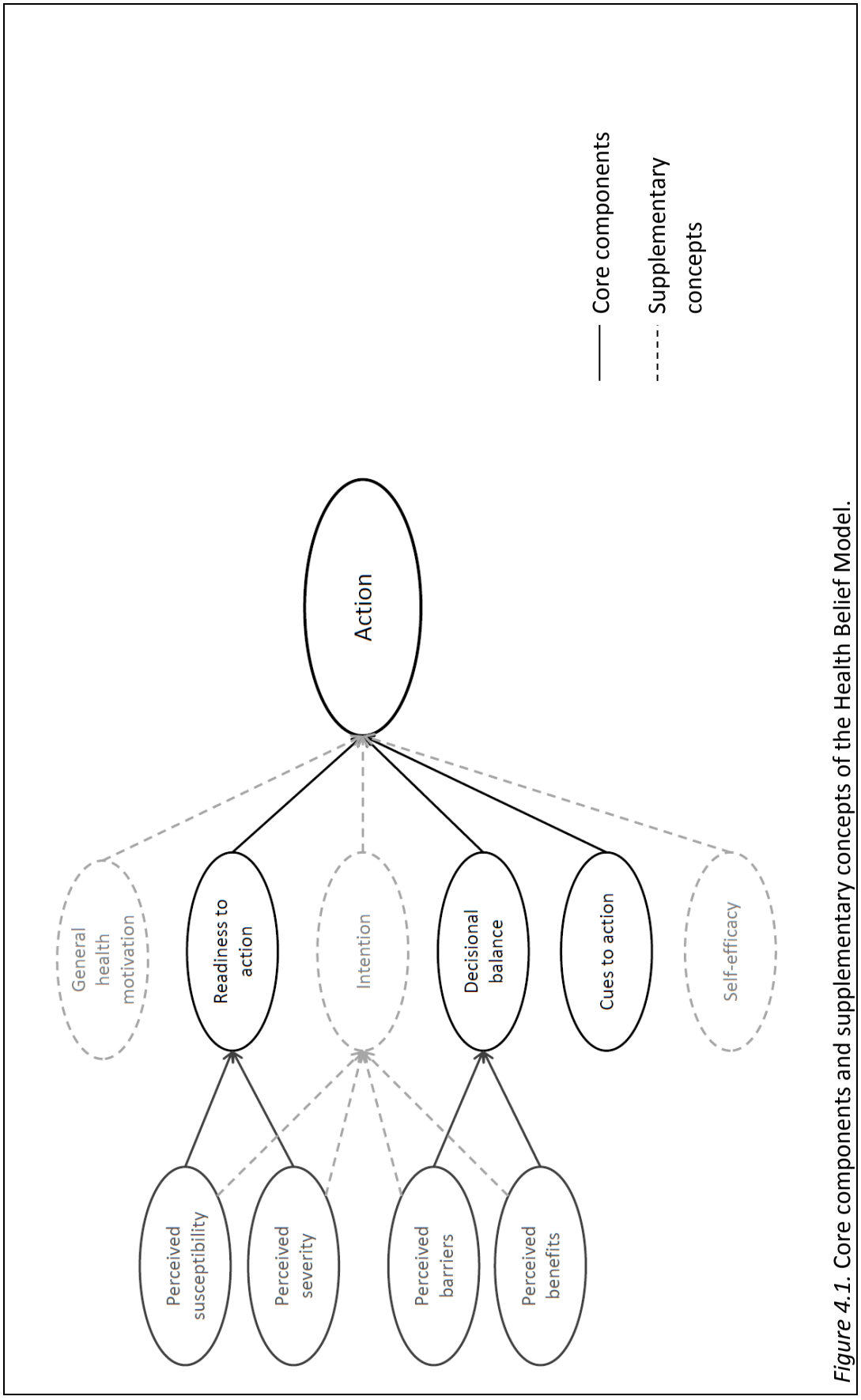

Figure 4.1. Core components and supplementary concepts of the Health Belief Model.

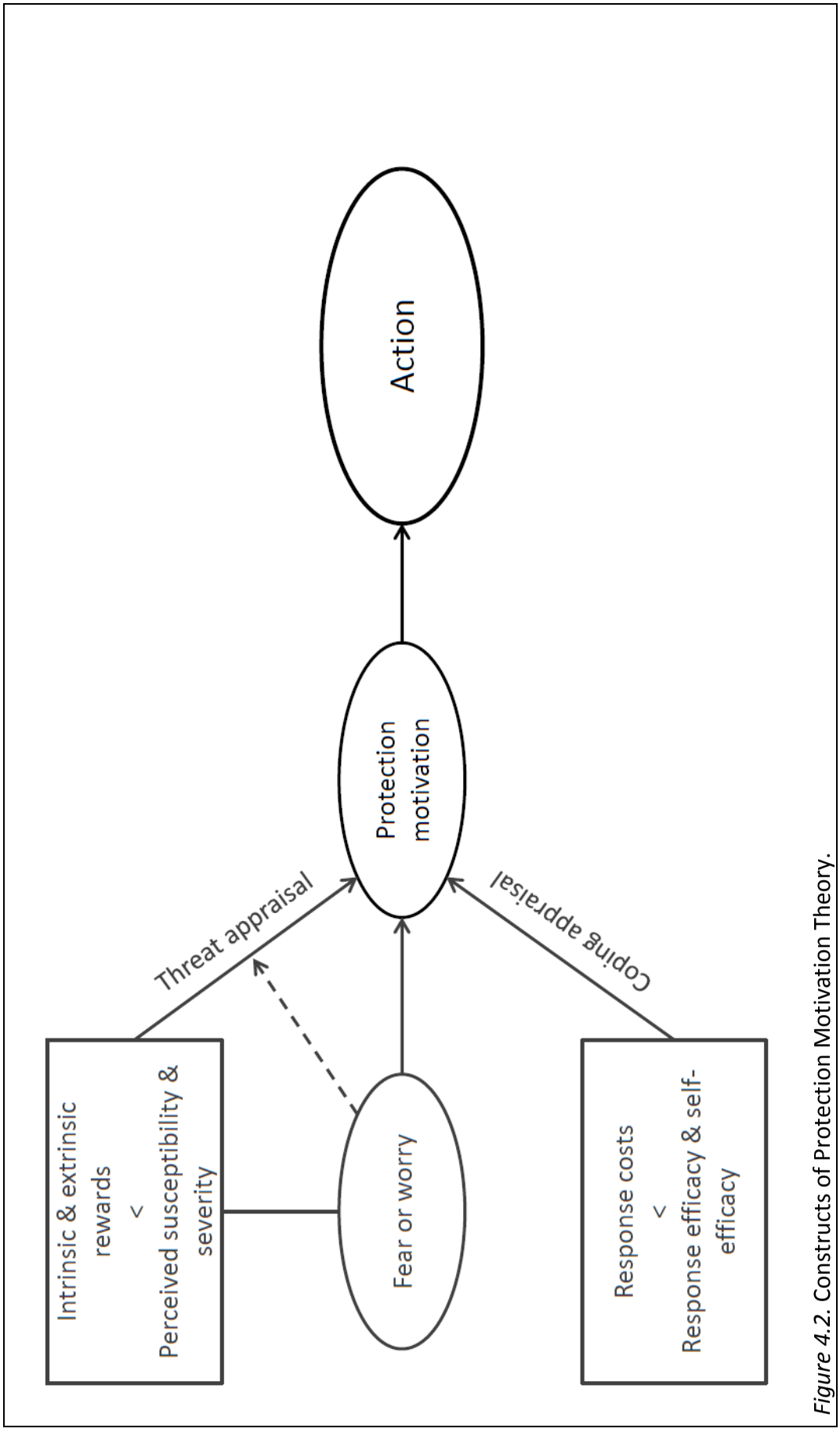

Figure 4.2. Constructs of Protection Motivation Theory.

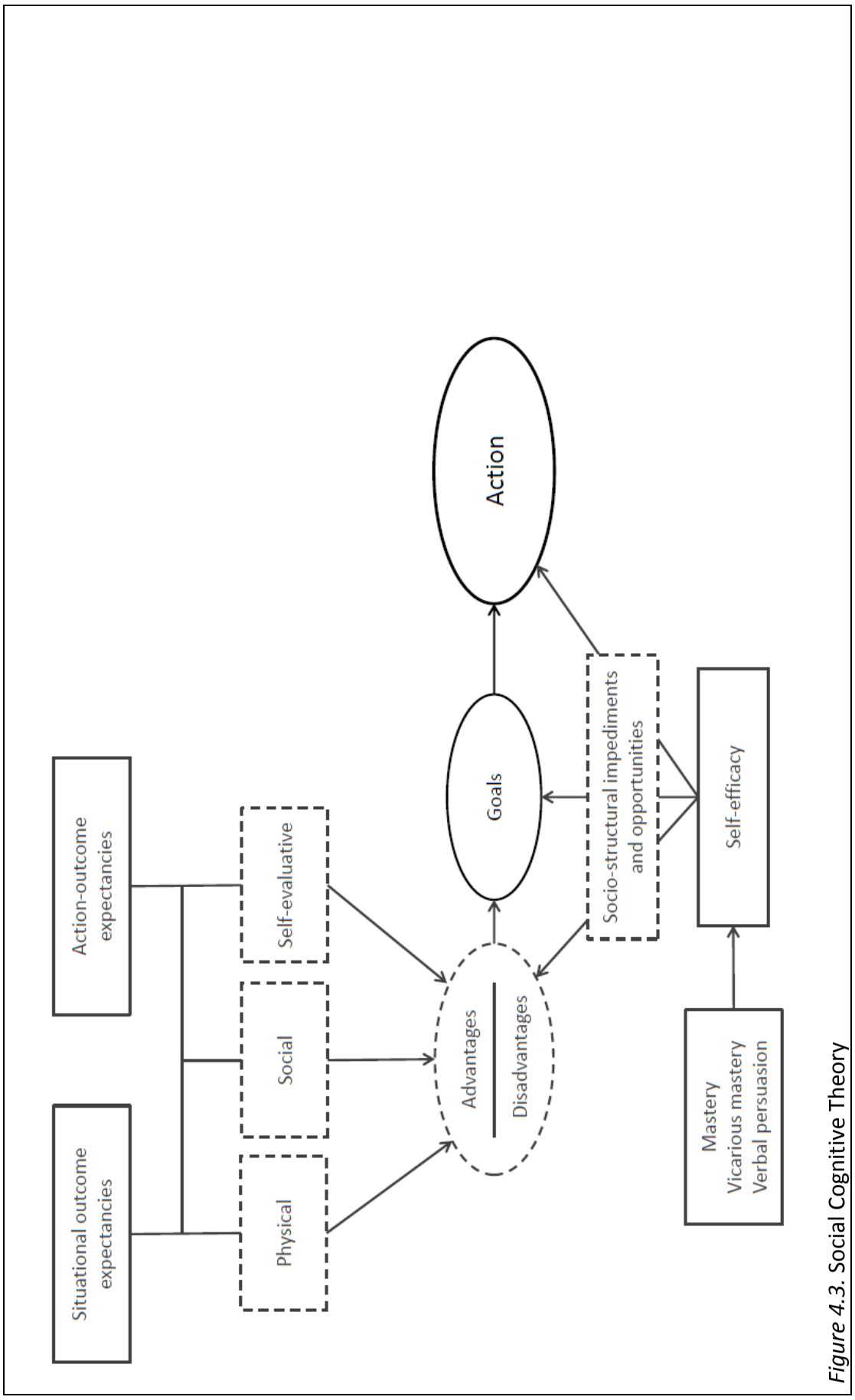

Figure 4.3. Social Cognitive Theory

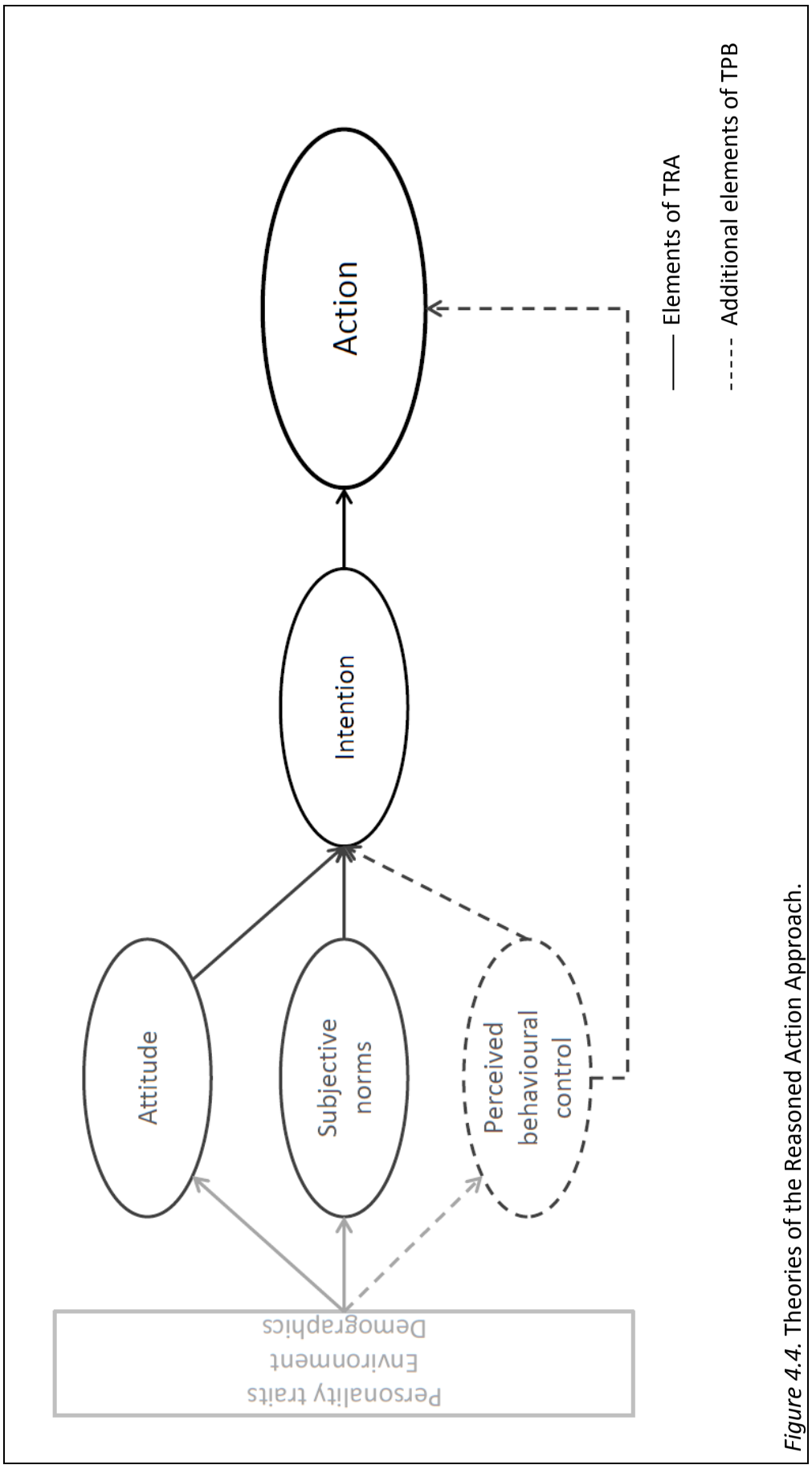

Figure 4.4. Theories of the Reasoned Action Approach.

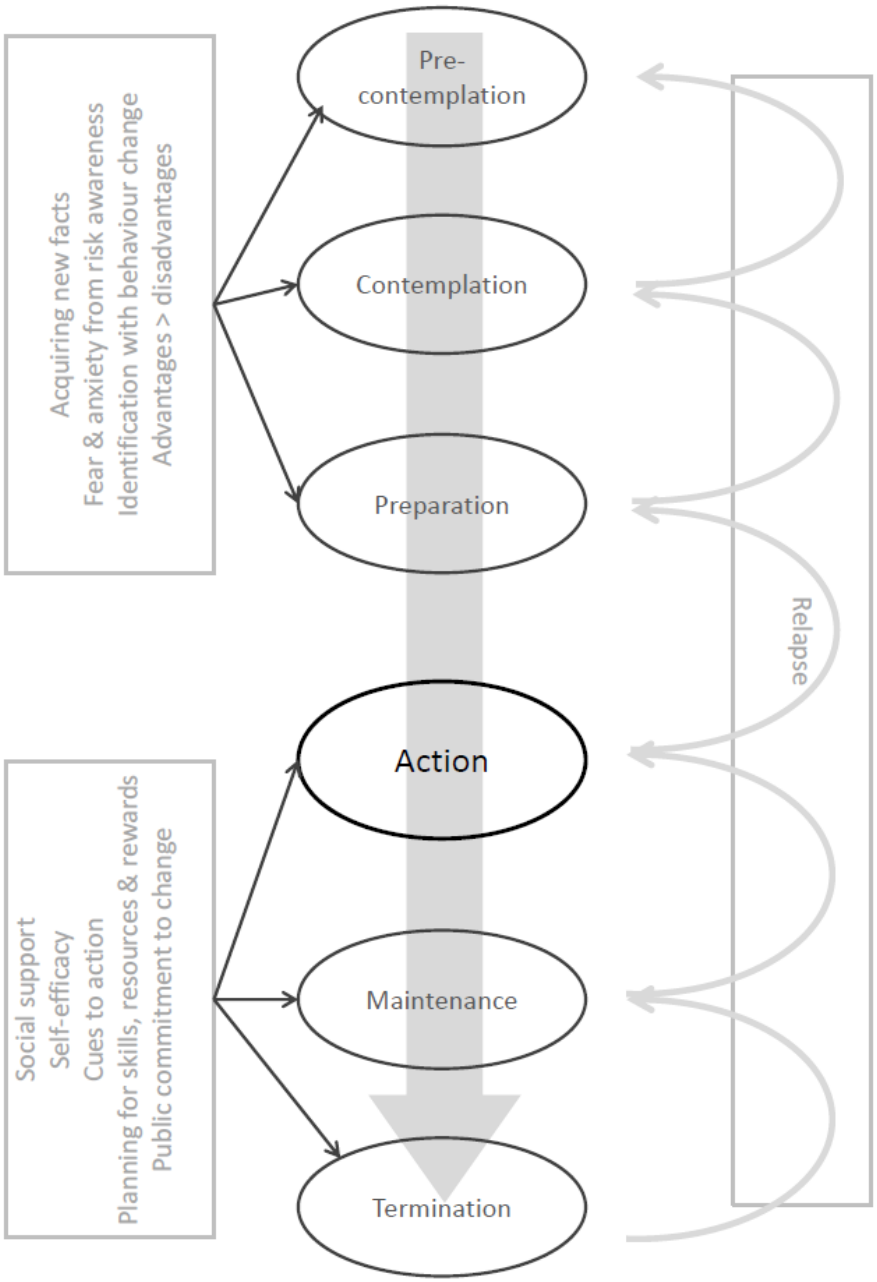

Figure 4.5. Stages of the Transtheoretical Model.

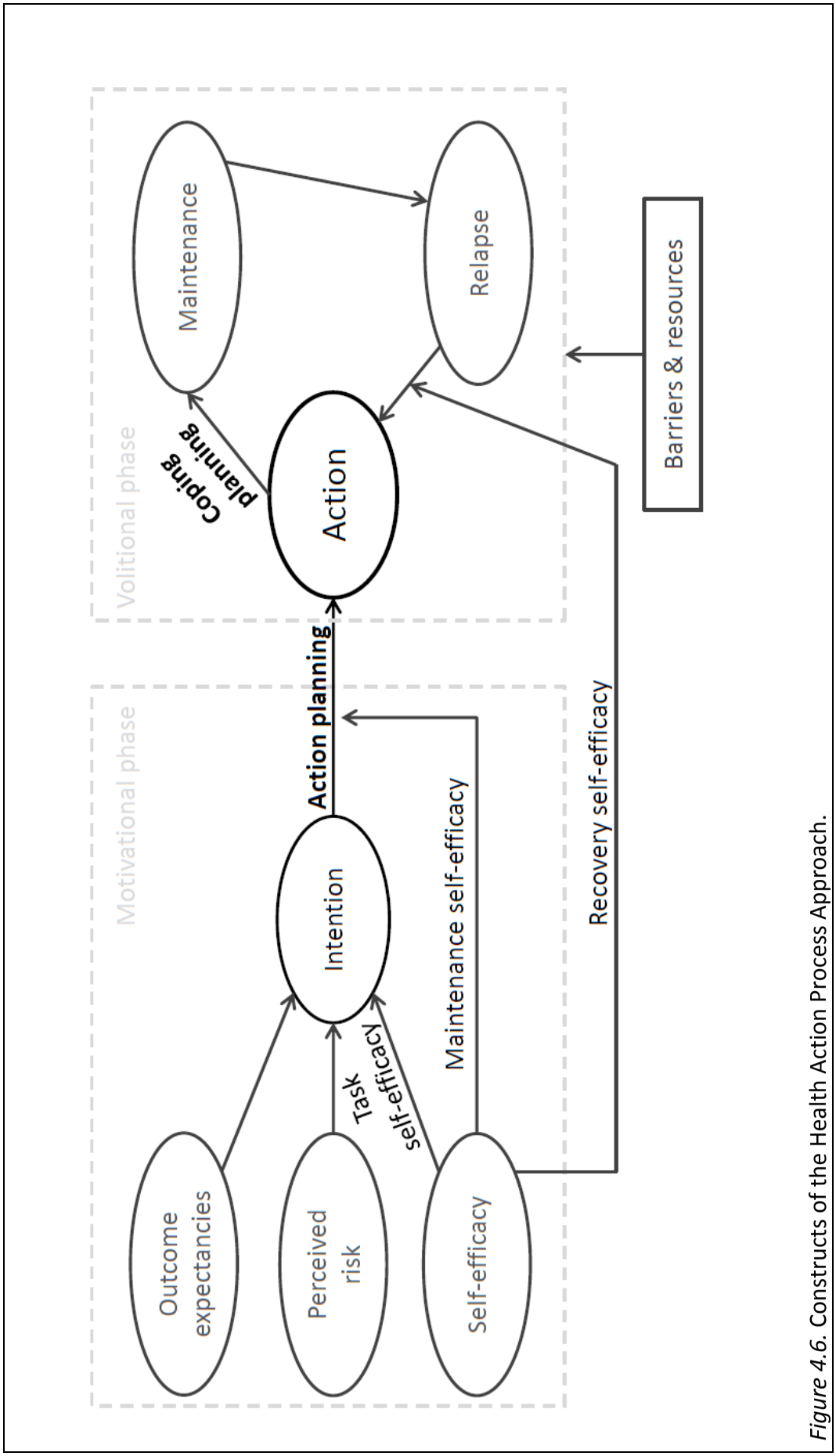

Figure 4.6. Constructs of the Health Action Process Approach.

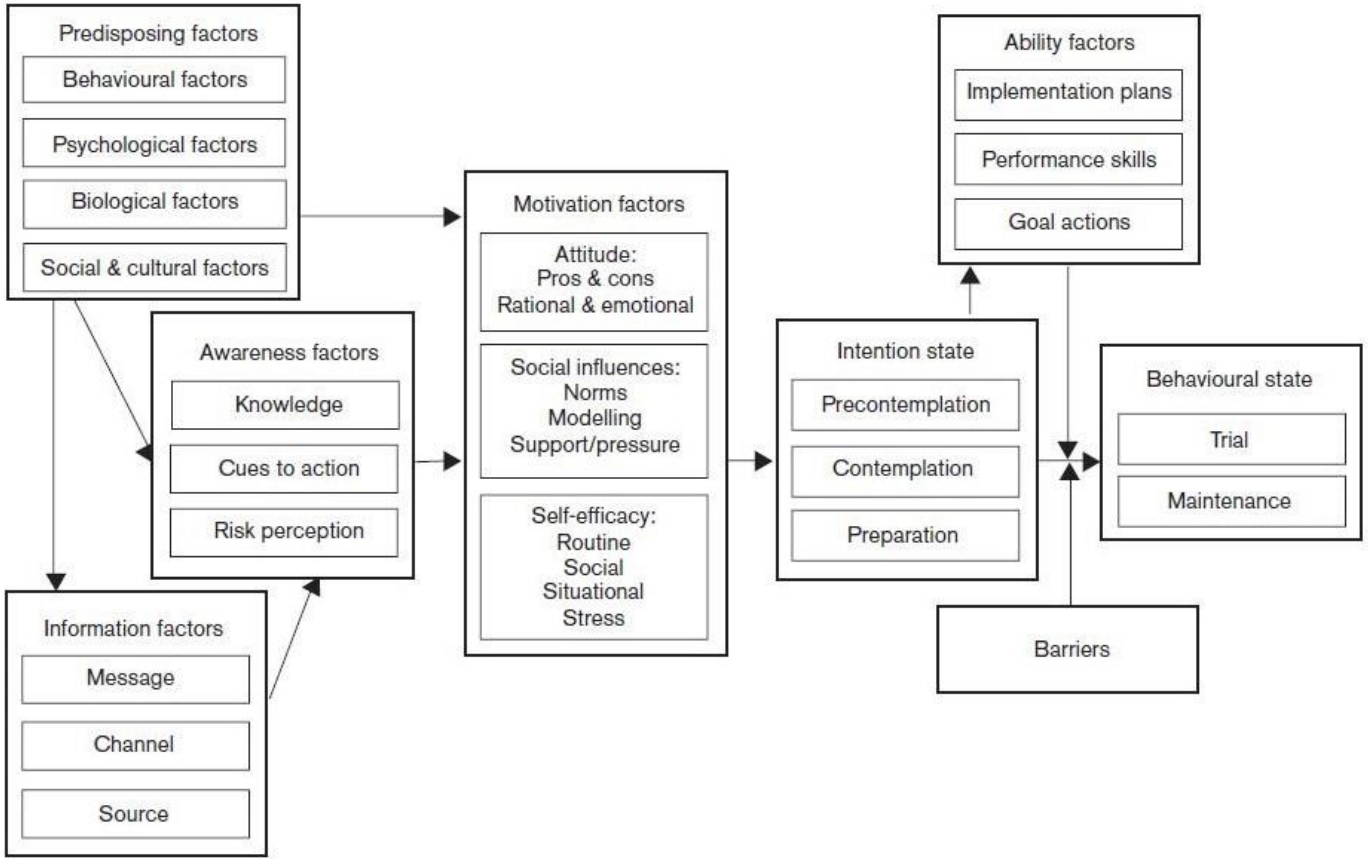

Figure 4.8. The Integrated Model of Behavioural Change. Reproduced from "The European Smoking prevention Framework Approach (EFSA): An example of integral prevention," by H. de Vries, A. Mudde, I. Leijs, A. Charlton, E. Vartiainen, G. Buijs, … S. Kremers, 2003, *Health Education Research, 18*(5), 612. Copyright 2003 by Oxford University Press.

Appendix C

5. Screening "in the fullness of health": Women's views of cervical cancer prevention

Recruitment material

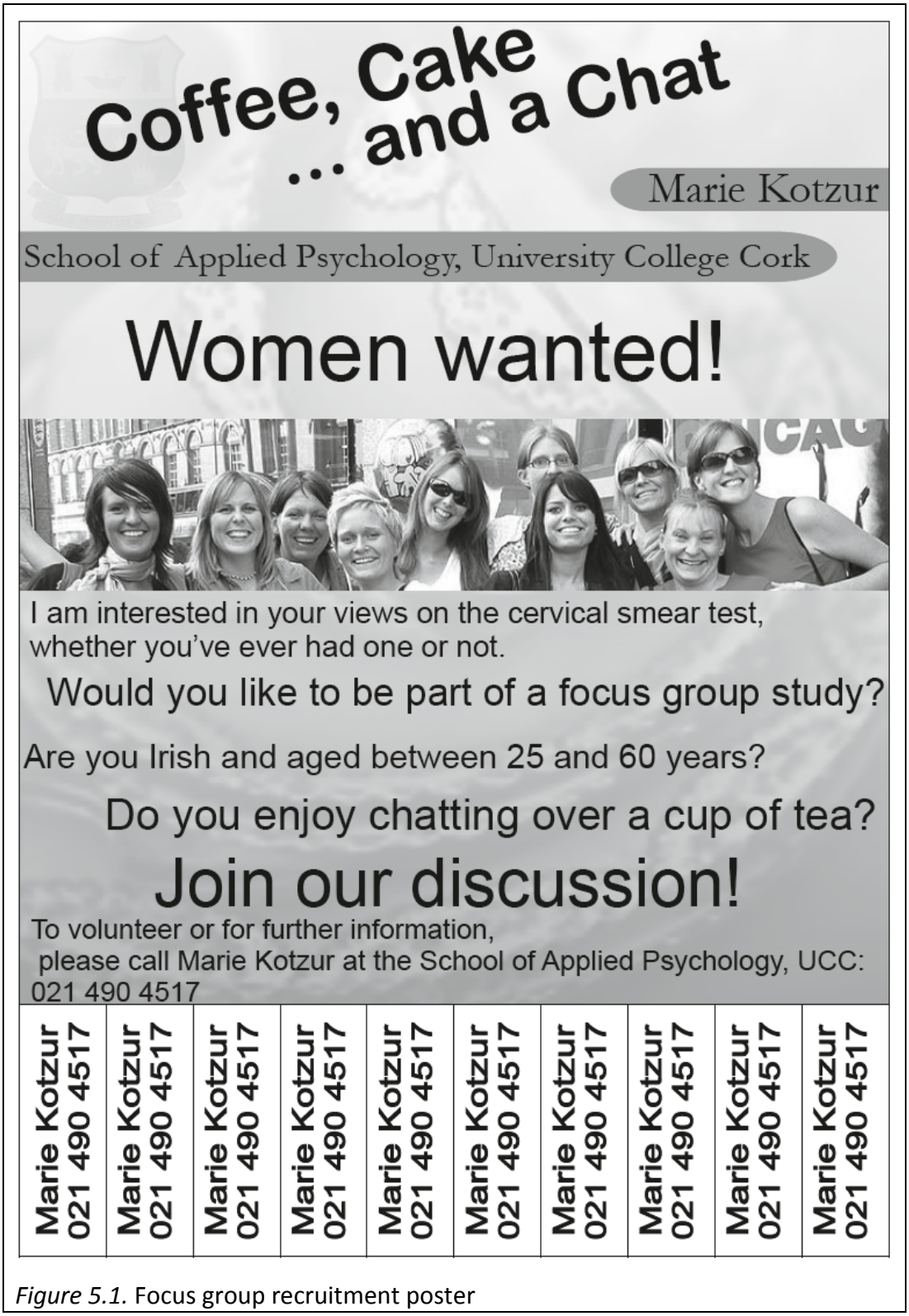

Figure 5.1. Focus group recruitment poster

Interview schedule

Introduction – *10 min*

Thank you all for coming. My name is Marie Kotzur, I'm running the cervical screening study, and this is my assistant, [name]. In this meeting we want to find out about your views on the cervical smear test.

The discussion should take about an hour and half. [assistant's name] will record the meeting, so it is easier for us to analyse your answers later. I know the information you might share in this group may be very personal to you, but I can assure your names will not be used in any reports of this study. But I must also ask you to respect each other's confidentiality. So anything that is said in this room, has to stay in this room.

There is tea and coffee on the side of the room and there is cake as well. Please, help yourselves to them whenever you feel like it. If you need the bathrooms, turn right, walk down the hall and turn right again. I would much appreciate if you could put your phones on silent. If you're expecting an important call, it'd be great if you could take any calls that can't wait, outside, so they won't interrupt the group.

Now, we'll start in a minute and I will ask you some questions that I would like you to talk about. In principle, you can speak whenever you feel like it, but some of you may be rather shy and others may like to talk a lot, so it may be that I have to interrupt you, but this is only to give others a chance to talk as well or I might call on you directly to hear your views.

Now, let's introduce ourselves first: Tell us your names and where you're from and what you like to do in your free time. – *5 min* → Marie, from Germany, lived in Cork for 5 years, like to garden *[indication to pass question around in a circle]*

There is no need to go around in circles anymore now, just speak when you feel like it.

- What do you know about the cervical smear test? – *10 min*
  - How informed do you feel about it?
  - Who do you talk to about smear tests?
  - What do your friends think about the smear test?

  - What does your family think about the smear test
  - How do you feel about cervical screening?
- How many of you have had a cervical smear in the past five years? Please, raise your hand if you have. – *30 sec [call number out for tape]*
- Try to remember the last time you were reminded to have a smear test. What was your reaction to it? – *10 min*
  - What was the reminder?
  - What did you do about it?
  - How did you feel about it?
  - Did you go for the test?
- How do you feel about going to the doctor for a smear test? – *20 min*
  - What is it like to have a smear?
  - How do you feel before/ during/ after the procedure?
  - Imagine you had to go to the doctor for a smear test after this group. What are you feeling?
  - What positive feelings are there?
  - What negative feelings are there?
- What is good about cervical screening? – *15 min*
  - What are the advantages of the test?
  - How does it benefit you?
  - What makes it easy to get the test?
- What is bad about cervical screening? – *15 min*
  - What are the disadvantages of the test?
  - What makes it difficult to get the test?
  - How could the service be improved?
- If you were trying to get more women to go for a smear, what do you think would be the most important aspect to talk about? – *5 min*
- Is there anything that you came waiting to say, but didn't get a chance to say? – *5 min*
  - Have we missed anything?

➔ 6 questions = 90.5 min

Transcript

Transcription key:

… = short pause

[…] = long pause

, = pause, long enough to take a breath

; = end of sentence: voice becomes lower and pause to take breath

? = question: voice up

! = exclamation

'…' = reported speech

Unfinished wo- = unfinished words

This is an example of - = unfinished sentence

Words in bold = special emphasis in speech

Abbreviations:

L … Laura*

S … Sarah*

M … Mary*

J … Judy*

I … Interviewer

** all names have been changed*

Group: G1 – regular screeners **Date:** 03/ 09/ 2011 **Time:** 10.00 -12.00 am

I: … first I'd like to know what you know about the cervical smear test.
[…]

L: Ahm, it's to detect, ahm, whether you ha- have the first, ah signs, I suppose, of ehm, that you may that you may lea- lead on on to … cancer; not that you would have cancer, but you would have that, you would have the first signs

M: That's about my understanding of it as well

S: It's for other things as well though, isn't it? It's not just cancer

L: And yeah, I suppose, STDs yeah, maybe, is it? Yeah, well, if you if you have ahm

S: Like HPV or something like that as well?

L: Yeah, HPV, yeah

S: Those kind of things […] it's undignifying

All: *laugh* […]

J: They brought in a, ehm, a national screening programme in the last few years so I think it's everybody from, I think it's 25 to 60-

S: Yeah

J: Is on it, ehm

M: And you're supposed to get it every 2 to 3 years, isn't it?

J: It's actually, I I, I I, I was a GP, I'm not a GP now, I'm lecturing in the School of Medicine, but ehm, and I wasn't a GP for about 10 years but eh I used to do smears,ehm, so it's every, you have to have 2 normal ones within three years and then it's every 5 years after that

S: Every 5 years?

M: Oh!

J: After you got your 2 normal ones

S: Yeah yeah yeah

L: Yeah, I'm actually form Limerick, so they piloted the scheme in Limerick so -

I: Alright!

L: From a kind of I suppose, I suppose a lot of my friends wouldn't have had smears until late in their twenties but I would have had them done from my early twenties because of that pilot scheme, cause they got everybody in Limerick on the scheme so, ehm, I would have probably started having smears before my before my friends that weren't living in Limerick, so … ahm, I think I think that's what, that's where the awareness came from for for me anyway I don't know probably if I wouldn't have started going for them later it wasn't for that

J: Mhm

M: I think they done a lot of publicity work

L: Yeah

S: Hm yeah

M: Over the last few years as well trying to push people to go and get them

L: Like I don't really know how I would have known to go and get them other, other than I was called at that time

S: Mhm

M: Yeah

L: Like my mum never told me like to - [*laughs*]

M: *[laughs]* No! Certainly not

L: 'You need to go and get a smear' even though she would probably been getting them done herself, but she would never like discuss that with me

J: Because that's the kind of thing you discuss with your mother, is it? Or with your daughters maybe?

L: Mhm, well, now I do, but ahm,

J: When you were younger, you had -

L: Before I knew about it I wouldn't have, yeah

J: Yeah

I: Who do you talk to about smears then? […]

S: Friends

M: Yeah

L: Yeah, I do talk to my friends about it now, my close friends yeah

M: Yeah

J: Yeah

S: Well, the first time I heard about it was when I was in first year in college a friend of mine was going for one and, I don't know, I didn't really know much about them at that point you, but she emphasised the importance of them, you know, so ehm, yeah; I still didn't get one for about 5 years after that [*laughs*]

M: *laugh*

L: *laugh*

M: I'd say friends as well, ehm, … definitely not parents *[laughs]*

All: *laugh*

M: I don't think it's something that my group of friends would discuss hugely though, I think, somebody might say they've gone to get one

S: Yeah, it wouldn't be a discussion like, just

M: Yeaah

J: No

S: A mention, like, I suppose

L: I would have kind of discussed it with my friends but I'm a nurse so

M: *[laughs]* Yeah

S: *laughs*

L: I suppose, like I would, even though … even though I would have discussed it with my friends, but I know some of my friends that would have, would go for them and **still** some of my friends, like I'm 36 now and **still** some of my friends that would have only got their first smear done in the past year or, 2 -

M: Mhm

L: Like they would have been aware of the, I think people are, I think, one friend in particular I can think of, I know she was kind of I think afraid of the whole thing, cause you just hear hor- like you hear 'Aw, I don't want to go for my smear', you know -

M: Yeah

J: Yeah

L: That sort of thing, hear that sort of thing, aaah, horrible stories also, ehm …

M: It's not, I think a lot of people are kind of uncomfortable about it a bit, it's not-

L: And yeah

M: The nicest thing to do

L: I know 2 of my closest friends as well have had like… SIN 3, so they've had like thee, you know, the worst -

S: The LLETZ

L: Yeah the LLETZ, so like, like we would discuss it, you know … because of that I think

M: I think the Jade Goody thing did a lot as well, when she died from it

J: Mhm

L: Yeah…

Coding

Group: G1 – regular screeners **Date:** 03/ 09/ 2011 **Time:** 10.00 -12.00 am

I:	… first I'd like to know what you know about the cervical smear test. […]	
L:	Ahm, it's to detect, ahm, whether you ha-	considering smear to be early detection
	have the first, ah signs, I suppose, of ehm,	
	that you may that you may lea- lead on	considering smear to be preventative
	on to … cancer; not that you would have	not considering smear as test for cancer
	cancer, but you would have that, you would have the first signs	considering smear to be early detection
M:	That's about my understanding of it as well	
S:	It's for other things as well though, isn't it? It's not just cancer	misunderstanding smear as more than cc screening
L:	And yeah, I suppose, STDs yeah, maybe, is it? Yeah, well, if you if you have ahm	misunderstanding smear as STD test
S:	Like HPV or something like that as well?	considering smear as test for HPV
L:	Yeah, HPV, yeah	
S:	Those kind of things […] it's undignifying	considering smear as indignifying
All:	*laugh* […]	
J:	They brought in a, ehm, a national screening programme in the last few years so I think it's everybody from, I think it's 25 to 60 -	Knowing about ICSP knowing about smear guidelines
S:	Yeah	
J:	Is on it, ehm	
M:	And you're supposed to get it every 2 to 3 years, isn't it?	unawareness of cc screening intervals

J:	It's actually, I I, I I, I was a GP, I'm not a GP now, I'm lecturing in the School of Medicine, but ehm, and I wasn't a GP for about 10 years but eh I used to do	having been a GP
	smears,ehm, so it's every, you have to	having taken smears
	have 2 normal ones within three years	relying on pervious cc screening intervals
	and then it's every 5 years after that	for guidance
S:	Every 5 years?	
M:	Oh!	
J:	After you got your 2 normal ones	
S:	Yeah yeah yeah	
L:	Yeah, I'm actually form Limerick, so they piloted the scheme in Limerick so -	having taken part in ICSP pilot
I:	Alright!	
L:	From a kind of I suppose, I suppose a lot of my friends wouldn't have had smears	having unscreened friends
	until late in their twenties but I would	friends cc screening from late 20s
	have had them done from my early	having been cc screening from early 20s
	twenties because of that pilot scheme,	early exposure through pilot
	cause they got everybody in Limerick on the scheme so, ehm, I would have	
	probably started having smears before	starting cc screening earlier than friends
	my before my friends that weren't living in Limerick, so … ahm, I think I think that's	
	what, that's where the awareness came	increased awareness due to early pilot
	from for for me anyway I don't know	exposure
	probably if I wouldn't have started going	not expecting to be cc screening from
	for them later it wasn't for that	early age without pilot
J:	Mhm	
M:	I think they done a lot of publicity work	awareness of increased publicity
L:	Yeah	

S:	Hm yeah	
M:	Over the last few years as well trying to push people to go and get them	feeling pushed to get smear
L:	Like I don't really know how I would have known to go and get them other, other than I was called at that time	lacking information without ICSP pilot being called for cc screening
S:	Mhm	
M:	Yeah	
	Like my mum never told me like to -	not being told to cc screen by mother
L:	[*laughs*]	
M:	*[laughs]* No! Certainly not	not being told to cc screen by mother
L:	'You need to go and get a smear' even though she would probably been getting them done herself, but she would never like discuss that with me	not being told to cc screen by mother expecting mother to cc screen not discussing smear with mother in past
J:	Because that's the kind of thing you discuss with your mother, is it? Or with your daughters maybe?	not discussing smear with mother wondering if discussing smears with daughters
L:	Mhm, well, now I do, but ahm,	discussing smear with mother now
J:	When you were younger, you had -	
L:	Before I knew about it I wouldn't have, yeah	not discussing smear with mother in past
J:	Yeah	
I:	Who do you talk to about smears then? […]	
S:	Friends	talking to friends about smear
M:	Yeah	
L:	Yeah, I do talk to my friends about it now, my close friends yeah	talking to friends about smear talking to friends about smear
M:	Yeah	
J:	Yeah	

S:	Well, the first time I heard about it was when I was in first year in college a friend	hearing from friend about smear
	of mine was going for one and, I don't	knowing friends who had smears
	know, I didn't really know much about them at that point you, but she	not knowing much about smear in past
	emphasised the importance of them, you know, so ehm, yeah; I still didn't get one	hearing from friend about smear not going for smear after being told by
	for about 5 years after that [*laughs*]	friend
M:	*laugh*	
L:	*laugh*	
M:	I'd say friends as well, ehm, … definitely not parents *[laughs]*	talking to friends about smears not talking to parents about smears
All:	*laugh*	
M:	I don't think it's something that my group of friends would discuss hugely though, I	not discussing smears with friends
	think, somebody might say they've gone to get one	mentioning smear among friends
S:	Yeah, it wouldn't be a discussion like, just	not discussing smears with friends
M:	Yeaah	
J:	No	
S:	A mention, like, I suppose	mentioning smear among friends
L:	I would have kind of discussed it with my friends but I'm a nurse so	discussing smear with friends nurses talk differently about smear
M:	*[laughs]* Yeah	
S:	*laughs*	
L:	I suppose, like I would, even though …	
	even though I would have discussed it with my friends, but I know some of my	discussing smear with friends
	friends that would have, would go for	knowing friends who had smears
	them and **still** some of my friends, like I'm 36 now and **still** some of my friends that	knowing friends who haven't had smears

	would have only got their first smear done in the past year or, 2 -	knowing friends who started smears late
M:	Mhm	
L:	Like they would have been aware of the, I think people are, I think, one friend in particular I can think of, I know she was kind of I think afraid of the whole thing, cause you just hear hor- like you hear 'Aw, I don't want to go for my smear', you know -	friends don't screen despite awareness knowing friends afraid of smear sharing bad smear experiences with friends
M:	Yeah	
J:	Yeah	
L:	That sort of thing, hear that sort of thing, aaah, horrible stories also, ehm …	sharing bad smear experiences with friends
M:	It's not, I think a lot of people are kind of uncomfortable about it a bit, it's not -	feeling uncomfortable about smear
L:	And yeah	not finding smear nice thing to do
M:	The nicest thing to do	having close friends with positive smears
L:	I know 2 of my closest friends as well have had like… SIN 3, so they've had like thee, you know, the worst -	having close friends with positive smears having close friends with positive smears
S:	The LLETZ	
L:	Yeah the LLETZ, so like, like we would discuss it, you know … because of that I think	having friends with treatment after smear | discussing friends' treatment after smear
M:	I think the Jade Goody thing did a lot as well, when she died from it	remembering Jade Goody
J:	Mhm	
L:	Yeah	
M:	It created a lot of publicity …	awareness through Jade Goody

Categories and themes

Table 5. 1
Extract of the Analytic Categorising from Line Codes to Perspectives

Line code	Sub-theme	Theme	Sub-category	Category	Perspective
Being advised by doctor about smear 2			Expecting info from medical staff	Sources of information	Understanding
Being informed by doctor 1					
Desiring more information from magazines 3			Expecting info from media		
desiring more information in smear reminder 1			Expecting info from medical correspondence		
Not receiving information in post 4					
Considering smear as looking for women with cervical abnormalities 4		Knowing reasons for smear	Level of info about smear	True level of information	
acknowledging false confidence 3		Knowing limits of smear			
Assuming some people get smear without ICSP 1		Subjective norm to get smear		Subjective Norm	Inter-individual
Being persuaded by mother to get a smear 3					
Assuming mother never had smear 1		Excluding non-screeners from social norm group			

Table 5. 1

Extract of the Analytic Categorising from Line Codes to Perspectives

Line code	Sub-theme	Theme	Sub-category	Category	Perspective
assuming mother not used to regular screening 2					
Desiring peer pressure to get smear 3		Positive attitude to peer pressure			
Seeking social support for smear 3		Requiring social support		Social support	
Seeking social support from friends about smear 3					
Usually not seeking social support 3	Not seeking social support	Not requiring social support			
assuming aunts would talk about smear 2		High social support from family			
Being close to mother 4					
Being pleased with own GP 3	Good relationship with GP	Social support from GP			
Being pleased with understanding doctor 3					
appreciating cancer screening 2, 4		Appreciating cancer screening		Attitude to cancer prevention	Attitude
Finding cancer screening important 3					
Desiring better prevention strategies 4		Negative attitude to prevention strategies			
Feeling long-term risks of HPV are missed 4					

Table 5. 1

Extract of the Analytic Categorising from Line Codes to Perspectives

Line code	Sub-theme	Theme	Sub-category	Category	Perspective
Being positive about smear 1, 4		Positive attitude to smear	General attitude to the Pap test	Attitudes to the Pap test	
Finding smear medicalises life 4		Negative attitude to smear			
Being used to smear 1,2,3,4	Smear is routine	Positive attitude to the procedure	Attitude to the procedure		
Not finding smear complicated 1, 2					
Expecting smear to be worse than it is 1,3,4	Expected discomfort > real discomfort				

Notes. A selection of categories, themes and line codes are presented for three of the seven perspectives for brevity, numbers behind line codes indicate in which transcripts quotes can be found for this code.

Appendix D

5. Irish opinions of cervical cancer screening

Data collection material

Irish opinions of cervical cancer screening

Welcome!

This study seeks to find out about women's views of cervical cancer screening in Ireland. It is part of my doctoral research project which examines the predictors of screening uptake. The questionnaire takes approximately 25 minutes to complete.

If you are between 25 and 60 years old and living in Ireland, I would much appreciate if you completed my survey.

More questions? Please email me at m.kotzur@ucc.ie or give me a call: 021 490 4517.

Thank you so much for you help,
Marie Kotzur

- - - - - -
PhD Candidate
School of Applied Psychology
University College Cork
Ireland

Before we start I want to assure you that your participation is entirely voluntary and you can choose to exit the survey at any time.
All your responses are anonymous and confidential and I will store them securely. Your answers will be collated with those of other participants and won't be published individually or in combination with any personally identifying information.
You can withdraw your data from the study up to the point when you press 'Submit' at the end of the survey.

There are some questions in the survey that address potentially sensitive issues, but they are not expected to leave you feeling distressed. If you feel that you would like to talk to someone, please contact your GP or the Irish Samaritans if you want to talk to somebody right away: 1850 60 90 90 (helpline) or http://www.samaritans.org/how-we-can-help-you/contact-us

If you have any further questions about cervical smears, you might find the following web pages helpful:

http://www.cancer.ie/reduce-your-risk-hpv-and-cervical-cancer
http://www.cervicalcheck.ie/
http://www.irishhealth.com/article.html?id=2928

1) Please, indicate below that you have understood the above and agree to take part in this study.

( ) I understand that my participation is voluntary and that the information I provide is anonymous and confidential.

Inclusion Criteria[8]

2) Please indicate your sex.

( ) female ( ) male

3) Please state your age (in years).

_____

4) Were you born in the Republic of Ireland?

( ) yes ( ) no

5) Have you ever lived outside the Republic of Ireland for more than 1 year?

( ) yes ( ) no

6) Have you had a hysterectomy?

( ) yes ( ) no ( ) I don't know

Have you ever had a Pap test?

7) Cervical screening uses a procedure called the Pap test or smear test. Have you ever had a Pap test?

( ) yes ( ) no ( ) I don't know

About your Pap test...

8) How long ago was your last Pap test?

_____

9) Have you ever gotten an abnormal Pap test result?

( ) yes ( ) no ( ) I don't know

---

[8] Participants who did not fit the inclusion criteria (female, age 25-60 years (incl.), born in Ireland, never lived outside Ireland for more than 12 months, never had hysterectomy) were redirected to a thank you page explaining why they were unable to participate.

What do you think of the Pap test?

The questions below ask about your opinion of the Pap test, so there are no right or wrong answers. Just select the first option that appears accurate to you.

10) How likely is it that you will attend for a Pap test when invited next?

( ) 1 – extremely likely ( ) 2 ( ) 3 ( ) 4 ( ) 5 – extremely unlikely

11) I think it is my duty to attend for regular Pap tests.

( ) 1 – strongly disagree ( ) 2 ( ) 3 ( ) 4 ( ) 5 – strongly agree

12) How would you feel if you did not attend for a Pap test?

	1 – extremely	**2**	**3**	**4 – not at all**
tense				
guilty				
worried				
regretful				

13) Please indicate how much you agree with the following statements.

	1 – strongly agree	**2**	**3**	**4**	**5 – strongly disagree**
It is unlikely that I will get cervical cancer even if I do not go for a Pap test.					
I do not think that I am personally at risk of cervical cancer.					
I do not think that I will get cervical cancer, because I have gotten the HPV vaccine.					

14) Compared to other women, my chances of having cervical cancer in the future are...

( ) ... much below average (-3)
( ) ... below average (-2)
( ) ... slightly below average (-1)
( ) ... average (0)
( ) ... slightly above average (+1)
( ) ... above average (+2)
( ) ... much above average (+3)

15) How serious do you think cancer of the cervix is?

( ) 1 – not serious
( ) 2
( ) 3
( ) 4
( ) 5
( ) 6
( ) 7 – most serious disease you can get

16) Do you have close friends or relatives with a cancer history?

( ) yes, with cervical cancer
( ) yes, with another type of cancer
( ) no

17) Please indicate how much you agree with the following statements.

	1 – strongly disagree	**2**	**3**	**4**	**5**	**6**	**7 – strongly agree**
The Pap test is too time-consuming.							
The Pap test would be embarrassing for me.							
I would be likely to forget to get this screening done.							
I would be fearful of the results of the Pap test.							
Having to get a Pap test would make me anxious.							
Getting the results from the Pap test would make me anxious.							
I would be fearful of the possible pain associated with the Pap test.							
I would not feel confident that getting a Pap test would prevent cervical cancer.							
The Pap test would make me feel psychologically uncomfortable.							
The Pap test would make me feel physically uncomfortable.							
I don't know where I could go if I wanted a Pap test.							

	1 – strongly disagree	2	3	4	5	6	7 – strongly agree
The Pap test is too expensive.							
I would feel humiliated by participating in cervical screening.							
The sex of the smear taker would be a barrier to me having a Pap test.							

What do you think of the Pap test?

A few more questions...

18) If a woman gets a Pap test, everyone will think she engages in sexually risky behaviour.

( ) 1 – strongly agree ( ) 2 ( ) 3 ( ) 4 – strongly disagree

19) Lack of personal cleanliness can cause cervical cancer.

( ) agree ( ) disagree ( ) I don't know

20) I think about getting cervical cancer.

( ) yes ( ) no

21) Please indicate how much you agree with the following statements.

	1 – strongly disagree	2	3 – neutral	4	5 – strongly agree
When I get a Pap test, I feel good about myself.					
When I have regular Pap tests, I don't worry as much about cervical cancer.					
Having regular Pap tests will allow me to feel healthy and relaxed for the future.					

	1 – strongly disagree	2	3 – neutral	4	5 – strongly agree
The Pap test will help prevent cancer.					
The Pap test will help find something wrong you can't see.					
The Pap test helps you take control of your health.					
The Pap test helps you protect your health.					

22) The following are different types of reminders. Please indicate on a scale from 1 to 6 how important these are for your Pap test attendance. (screened women only)

	1 – least important	2	3	4	5	6 – most important	not applicable
my doctor reminds me							
a person important to me reminds me							
seeing a reminder advertisement in a public place							
seeing a reminder in a magazine or newspaper							
receiving an invitation letter from CervicalCheck							
if somebody I knew discovered she had cervical cancer							
seeing my own reminder in a diary or calendar							

23) Have you ever encountered any of the following? (unscreened women only)

	yes	no	n/a
Has a doctor or other health professional ever recommended that you			

	yes	no	n/a
have a Pap test?			
Has a person important to you ever reminded you to have a Pap test?			
Have you ever seen a Pap test reminder advertisement in a public place?			
Have you ever seen a Pap test reminder in a magazine or newspaper?			
Have you ever received a Pap test invitation from CervicalCheck?			
Has anyone you know ever discovered that she has cervical cancer?			
Have you ever reminded yourself in a diary or calendar?			

24) Have you ever received an invitation for a Pap test?

( ) yes, from: _____ ( ) no

25) Attending for a Pap test when invited next would be...

( ) +3: positive ( ) -1

( ) +2 ( ) 0 ( ) -2

( ) +1 ( ) -3: negative

26) Attending for a Pap test when invited next would be...

( ) +3: worthwhile ( ) -1

( ) +2 ( ) 0 ( ) -2

( ) +1 ( ) -3: not worthwhile

27) Attending for a Pap test when invited next would be...

( ) +3: good ( ) -1

( ) +2 ( ) 0 ( ) -2

( ) +1 ( ) -3: bad

28) Attending for a Pap test when invited next would be...

( ) -3: harmful ( ) +1

( ) -2 ( ) 0 ( ) +2

( ) -1 ( ) +3: beneficial

29) Please indicate to what extent you agree with the following.

	1 – strongly agree	2	3	4	5 – strongly disagree
Most people who are important to me would think I should attend for a Pap test when invited next.					
Most people who are important to me would approve of me attending for a Pap test when invited next.					

30) Are there any family members or friends with whom you feel comfortable discussing a health issue, like cancer?

( ) yes ( ) no

31) How much control do you feel you have over whether or not you attend for a Pap test when invited next?

( ) 1 - no control ( ) 3

( ) 2 ( ) 4 - complete control

How much do you know about the Pap test?

This section looks at your level of information about the Pap test. Don't worry, if you don't know about something; it's just important for me to find out in what areas women need to be informed better.

32) Please, indicate for the following statements whether you think they are correct or incorrect.

	correct	incorrect	I don't know
I'm too old to need cervical screening.			
Cervical screening is not necessary once women have reached menopause.			
Healthy women need to have regular cervical screening.			
Women should have cervical screening soon after the first experience of sex.			
If I hadn't sex for ages, I wouldn't need cervical			

	correct	incorrect	I don't know
screening.			
Once you have a normal Pap test result, there is no need to go for more Pap tests.			
I only had one sexual partner, so there's no need to have cervical screening.			

33) Do you know when you should go for your next Pap test?

( ) in 6 months
( ) in a year
( ) in 3 years
( ) in 5 years
( ) in more than 5 years
( ) when I'm invited by CervicalCheck
( ) never
( ) I don't know

34) How can an inflammation of the cervix be treated? Please select as many of the options below as you believe to be correct. (select all that apply)

( ) arthroscopy
( ) conisation
( ) laser therapy
( ) antibiotics
( ) endoscopy
( ) cryotherapy
( ) chemotherapy
( ) biopsy
( ) I don't know

35) I don't know enough about cervical cancer to make decisions about its prevention.

( ) agree
( ) disagree

36) Please, indicate which of the following you believe to be risk factors for cervical cancer.

	yes	no	I don't know
being over 50 years			
having sex at an early age			
having multiple sexual partners			
having sexual activity with a man who has had multiple sexual partners			
having frequent sexual activity with the same man			
having a history of sexually transmitted disease			

	yes	no	I don't know
having several miscarriages			
giving birth to many children			
lack of Pap test screening			
having or having had an infection with Human Papillomavirus (HPV)			
smoking			
post-menopause			
taking the pill			
having had a previous abnormal Pap smear			
having sex without a condom			

How are you?

This section collects some demographic information and asks about your physical and mental health.
I have a lot of questions, I know. But you're being very good answering them all!

37) How do you feel about your health?

	1 - not at all	2	3	4	5	6	7- extremely
In general how interested are you in your health?							
In general how careful are you with your own health?							

38) In general would you say your health is...

( ) ... excellent
( ) ... very good
( ) ... good
( ) ... fair
( ) ... poor

39) Does your health currently limit you in these activities?

	yes, limited a lot	yes, limited a little	no, not limited at all
moderate activities, such as moving a table, pushing a vacuum cleaner, bowling or playing golf			
climbing several flights of stairs			

40) During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your health?

	yes	no
accomplished less than you would like		
were limited in the kind of work or other activities		

41) During the past 4 weeks have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems?

	yes	no
accomplished less than you would like		
didn't do work or other activities as usual		

42) During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

( ) not at all
( ) a little bit
( ) moderately
( ) quite a bit
( ) extremely

43) For each question please give one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks...

	all of the time	most of the time	a good bit of the time	some of the time	a little bit of the time	none of the time
... have you felt calm and peaceful?						
... did you have a lot						

	all of the time	most of the time	a good bit of the time	some of the time	a little bit of the time	none of the time
of energy?						
... have you felt downhearted and blue?						

44) During the past 4 weeks, how much of the time have your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?

( ) all of the time
( ) most of the time
( ) some of the time
( ) a little of the time
( ) none of the time

45) Please select the highest level of education that you have completed.

( ) less than Junior Certificate
( ) Junior Certificate
( ) Leaving Certificate
( ) Leaving Certificate with higher level courses
( ) Advanced or Higher Certificates
( ) Bachelor Degree
( ) Honours Bachelor Degree or Higher Diploma
( ) Masters Degree or Postgraduate Diploma
( ) Doctoral Degree

46) Which of the following best describes your occupation?

( ) housewife
( ) professional/ manager
( ) clerical
( ) skilled manual
( ) semi-skilled manual
( ) unemployed
( ) retired
( ) student
( ) other, please specify: _____

47) Please, state the occupation of the primary wage earner in your household.

_____

48) Are household finances an issue for you?

( ) yes
( ) no

49) Which of the following best describes your health insurance status?

( ) GP visit card
( ) medical card
( ) private health insurance
( ) no health insurance

50) Please, indicate which option best describes your marital status.

( ) married
( ) cohabiting
( ) divorced
( ) widowed
( ) single
( ) other: _____

51)	**yes**	**no**
Have you ever been pregnant?		
Are you currently taking care of any children younger than 12 years (not as part of your work)?		

The next few questions are about risk factors of cervical cancer, which is an important part of my study. They're quite personal questions and you can skip over them if you prefer, but I want to remind you that your participation is anonymous and your information will be treated confidentially.

52) Are you and your partner currently using contraception?

( ) Yes, I'm using condoms.
( ) Yes, I'm using a birth control pill.
( ) Yes, I'm using an intrauterine device (coil).
( ) Yes, but I'm using a different method of contraception.
( ) No, I'm not using contraception.
( ) No, but I'm not currently sexually active.

53) How old were you at your first sexual intercourse?

( ) 15-19 years
( ) 20-24 years
( ) older than 24 years
( ) I have never had sexual intercourse

54) Please indicate the total number of partners with whom you have had sexual intercourse.

Drop-down menu: 0 – 150

55) Please indicate the number of new partners with whom you have had sexual intercourse during the past 6 months.

Drop-down menu: 0 – 150

56) About your sexual health...

	yes	no
Have you had any genital symptoms in the past 5 years?		
Have you ever had a sexually transmitted infection (STI)?		
Have you ever been diagnosed with venereal warts, condylomas or HPV?		

You and the health service

This short section contains only a few questions about your experience of the health care system. We're almost done, I promise.

57) Is there a place that you usually go to when you are sick or need advice about your health?

( ) yes, a clinic or GP surgery ( ) somewhere else actually:_____

( ) the A&E department ( ) no

58) How often do doctors...

	1 - never	2 - rarely	3 - sometimes	4 - always
... give you the information you need?				
... give you enough time to ask questions?				
... listen carefully to what you have to say?				
... ask whether you have any questions?				
... treat you with respect?				
... seem to care about you?				
... respect your ideas about your health problem?				
... discriminate against you?				

59) Would you prefer the smear taker to be...

( ) ... female? ( ) ... male? ( ) I have no preference.

60) Would you recommend your smear taker to family or friends?

( ) yes ( ) no

Your personality

Last section! These questions look at different aspects of your personality. Don't think about the answers too much though, there's no right or wrong.

61) Each item below is a belief statement in relation to your health with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree to strongly agree. For each item select the option that best represents the extent to which you agree or disagree with that statement.

	1 – strongly disagree	**2 – disagree**	**3 – slightly disagree**	**4 – sightly agree**	**5 – agree**	**6 – strongly agree**
If I get sick, it is my own behaviour which determines how soon I get well again.						
No matter what I do, if I am going to get sick, I will get sick.						
Having regular contact with my physician is the best way for me to avoid illness.						
Most things that affect my health happen to me by accident.						
Whenever I don't feel well, I should consult a medically trained professional.						
I am in control of my health.						
My family has a lot to do with my becoming sick or staying healthy.						

	1 – strongly disagree	2 – disagree	3 – slightly disagree	4 – sightly agree	5 – agree	6 – strongly agree
When I get sick, I am to blame.						
Luck plays a big part in determining how soon I will recover from an illness.						
Health professionals control my health.						
My good health is largely a matter of good fortune.						
The main thing which affects my health is what I myself do.						
If I take care of myself, I can avoid illness.						
Whenever I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.						
No matter what I do, I'm likely to get sick.						
If it's meant to be, I will stay healthy.						
If I take the right actions, I can stay healthy.						
Regarding my health, I can only do what my doctor tells me to do.						

62) I consider myself a spiritual person.

( ) 1 - strongly disagree
( ) 2 - disagree
( ) 3 - neutral
( ) 4 - agree
( ) 5 - strongly agree

63) I see myself as someone who...

	1 – strongly disagree	**2**	**3**	**4**	**5 – strongly agree**
... tends to find fault with others.					
... does a thorough job.					
... is reserved.					
... is relaxed, handles stress well.					
... has an active imagination.					
... is generally trusting.					
... tends to be lazy.					
... is outgoing, sociable.					
... gets nervous easily.					
... has few artistic interests.					

64) Are the following statements true for you?

	yes	**no**
I consider advantages and disadvantages.		
I am an impulsive person.		
I buy things on impulse.		
I am impatient if kept waiting.		
I get carried away by ideas.		
I speak before thinking.		
I hate standing in line.		
I need to use a lot of self-control.		

	yes	no
I get into jams because I don't think.		
I do/say things without stopping to think.		
I get involved in things, which I later wish I could get out of.		
I think carefully before doing anything.		
I do things on the spur of the moment.		

The very last questions

And we're done! Thank you so much for answering my many questions. Before you leave could you just tell me...

65) ... how likely is it that you will attend for a Pap test when invited next?

( ) 1 – extremely likely ( ) 2 ( ) 3 ( ) 4 ( ) 5 – extremely unlikely

Thank You!

That's it!

Thank you for taking my survey.
Your help is very important to me. I need to know about women's views on cervial screening to design a campaign that will encourage more women to have a Pap test, as I consider this test to be a very important step in the prevention of cervical cancer. If you can think of any friends or relatives who might like to take part in this study, please let them know about my work.
If any of my questions have left you feeling distressed, please contact your GP or the Irish Samaritans, if you would like to talk someone right away: 1850 60 90 90 (helpline) or http://www.samaritans.org/how-we-can-help-you

If you have any further questions about cervical smears, you might find the following web pages helpful:

http://www.cancer.ie/reduce-your-risk-hpv-and-cervical-cancer
http://www.cervicalcheck.ie/
http://www.irishhealth.com/article.html?id=2928

If you have any further questions about this study, please do not hesitate to contact me at 021 490 4517 or m.kotzur@ucc.ie

Thanks again,
Marie.
- - - - - -
PhD Candidate
School of Applied Psychology, University College Cork
Ireland

Participant recruitment material

Figure 6.1. Survey advertisement.

Tuesday, 27 March, 2013

Marie Kotzur

School of Applied Psychology
Cork Enterprise Centre
North Mall
University College Cork
Phone: +353 (0)21 490 4517
Email: m.kotzur@ucc.ie

Another public recipient

xxxxxxx
xxxxxxx Road
xxxxxxx Town

Dear Sir or Madam,

As part of my doctoral research project on cervical screening, I am studying women's views of the cervical smear test. The test is of great medical importance in the detection of viral infections and the prevention of cervical cancer.

I have contacted you to ask for your help attracting volunteers to my research. If you would kindly display the attached poster at your premises, I will be much obliged to you.

The study has been reviewed and approved by the research committee of the School of Applied Psychology. Please, do not hesitate to contact me, if you would like further information about my research.

My thanks and kind regards,

Marie Kotzur
BA Psychology
School of Applied Psychology
University College Cork

Details of questionnaire items

Table 6.2
Details of Questionnaire Items

Variable	Sources	Score	Response Options	Reported Reliability Coefficient	Calculated Reliability Coefficient
Outcome variables					
Intention	adapted from Bish et al., 2000	one-item scale	five-point bipolar scale		
Post-survey intention	adapted from Bish et al., 2000	one-item scale	five-point bipolar scale		
Previous Pap test		one-item scale	yes, no, I don't know		
Past screening uptake (time since last Pap test)		one-item scale	open ended		
Health behaviour theories					
Perceived susceptibility	Walsh, 2006	mean of two items	five-point scale		α = .76
Perceived severity	Hennig & Knowles, 1990	one-item scale	seven-point scale		
Exposure to cervical cancer	adapted from Hislop et al., 2003	one-item scale	yes with cervical cancer, yes with another type of cancer, no		
Perceived barriers	Hill & Gick, 2011	mean of 14 items	seven-point Likert-scale	α = .89	α = .87

Table 6.2
Details of Questionnaire Items

Variable	Sources	Score	Response Options	Reported Reliability Coefficient	Calculated Reliability Coefficient
Perceived benefits	adapted from: Allahveridpour & Emami, 2008; Kahn et al., 2003	mean of seven items	five-point scale		α = .80
Cues to action	adapted from Hennig & Knowles, 1990	score each item individually	screened women: six-point scale + not applicable unscreened women: yes, no, not applicable		
Attitude	Sandberg & Conner, 2009	mean of four items	seven-point semantic differential scales	α = .82	α = .91
Subjective norms	Bish et al., 2000	sum of two items	five-point bipolar scale	α = .74	α = .95
Perceived behavioural control	Bish et al., 2000	one-item scale	four-point unipolar scale		
General health motivation	Hennig & Knowles, 1990	sum of two items	seven-point scale		α = .80
Anticipated regret	Bish et al., 2000	sum of four items	four-point unipolar scale	α = .89	α = .86
Unrealistic optimism	adapted from Weinstein, 1984	one-item scale	seven-point scale		
Patient invitation		one-item scale	yes, from:___; no		
Moral obligation	Whynes et al., 2007	one-item scale	five-point scale		

Table 6.2
Details of Questionnaire Items

Variable	Sources	Score	Response Options	Reported Reliability Coefficient	Calculated Reliability Coefficient
Fear of cervical cancer	Eaker et al., 2001a	one-item scale	yes, no		
Risk stigma	adapted from Byrd et al., 2004; Tung et al., 2010a	one-item scale	four-point scale		
Hygiene stigma	Mock et al., 2007	one-item scale	agree, disagree, I don't know		
Level of information					
Information level (cervical cancer)	adapted from Hoyo et al., 2005	one-item scale	agree, disagree		
Information level (Pap test)	adapted from Leung & Leung, 2010; Eaker et al., 2001b; NCSP (personal communication)	nine items: sum of correct answers	MCQ		α = .23
Information level (risk factors)	adapted from Leung & Leung, 2010; Ralston et al., 2003	15 items: sum of correct items	MCQ		α = .59
Demographics					
Age		one-item scale	open ended		
Education	National Qualifications Authority Ireland, 2009	one-item scale	categorical: nine options		

Table 6.2
Details of Questionnaire Items

Variable	Sources	Score	Response Options	Reported Reliability Coefficient	Calculated Reliability Coefficient
Occupation	adapted from Walsh et al., 2003	one-item scale	categorical: nine options		
Socio-economic status	adapted from Central Statistics Office, 2007	one-item scale	open ended		
Perceived poverty		one-item scale	yes, no		
Marital status	Arrossi et al., 2008; Ji et al., 2010; Murray & McMillan, 1993; Reiter & Linnan, 2011; Savage & Clarke, 2011; Sheinfeld Gorin & Heck, 2005; Somkin et al., 2004; Sung et al., 2002; Wang et al., 2010a	one-item scale	categorical: six options		
Health risk variables					
Ever been pregnant	Hansen et al., 2011	one-item scale	yes, no		
Child care	Rosvold et al., 2001	one-item scale	yes, no		
Perceived physical health	Ware et al., 1996	sum of six items	various	α = .86	α = .77
Perceived mental health	Ware et al., 1996	sum of six items	various	α = .77	α = .79

Table 6.2
Details of Questionnaire Items

Variable	Sources	Score	Response Options	Reported Reliability Coefficient	Calculated Reliability Coefficient
Contraception	adapted from Bourne et al., 2010	one-item scale	categorical: six options		
Age at first intercourse	adapted from Lazcano-Ponce et al., 2001	one-item scale	categorical: four options		
Lifetime number of sexual partners	Hansen et al., 2011	one-item scale	open-ended		
Number of new sexual partners in past 6 months	Hansen et al., 2011	one-item scale	open-ended		
Any genital symptoms in past 5 years	Eaker et al., 2001b	one-item scale	yes, no		
Any STI ever	Hansen et al., 2011	one-item scale	yes, no		
Ever diagnosed with HPV	Paskett et al., 2010	one-item scale	yes, no		
Health care resources					
Regular source of care	Swan et al., 2003	one-item scale	categorical: four options		
Doctor – patient relationship	Somkin et al., 2004	sum of eight items	four-point scale	α = .88	α = .87
Sex preference for smear taker	Hennig & Knowles, 1990	one-item scale	male, female, either		

Table 6.2
Details of Questionnaire Items

Variable	Sources	Score	Response Options	Reported Reliability Coefficient	Calculated Reliability Coefficient
Perceived quality of the smear taker	NCSP (personal communication)	one-item scale	yes, no		
Perceived social support in health matters	Seow et al., 2000	one-item scale	yes, no		
Health insurance status	adapted from NCSP (personal communication)	one-item scale	choose all that apply: four options		
Individual differences					
Personality (BFI)	Rammstedt & John, 2007	sum of two items on five dimensions	five-point Likert-scales	O: α = .72 C: α = .77 E: α = .83 A: α = .68 N: α = .74 total: α = .75	O: α = .25 C: α = .54 E: α = .51 A: α = .38 N: α = .34 total: α =
Impulsivity	Eysenck & Eysenck, 1978	sum of 13 items	yes, no	α = 0.82 (Eysenck & Eysenck, 1977)	α = .79
Health locus of control	Wallston et al., 1978	sum of six items on three sub-scales	six-point Likert-scale	internal HLoC: α = .77 powerful other HLoC: α = .67 chance HLoC: α = .75	internal HLoC: α = .62 powerful other HLoC: α = 0.65 chance HLoC: α = 0.60
Spirituality		one-item scale	five-point scale		

Notes.

Demographics

Table 6.3
Demographics

	Frequency	Percentage	Collapsed
Age (categorical)[a]			
25-44 years	206	81.75	
45-60 years	46	18.25	
Education[a]			
Junior certificate	4	1.59	
Leaving certificate	13	5.60	
Leaving certificate (higher)	24	9.52	
Advanced/ higher certificates	51	20.24	
Bachelor's degree	18	7.14	
Bachelor's degree (hons)/ Higher diploma	47	18.65	
Master's degree/ Postgraduate diploma	70	27.78	
Doctoral degree	25	9.92	
Occupation[a]			
Professional/ manager	102	40.48	Professional/ manager
Clerical	61	24.21	Clerical
Skilled manual	4	1.59	Manual
Unskilled manual	0	0.00	Manual
Housewife	19	7.54	At home
Student	56	22.22	Student
Unemployed	5	1.98	At home
Retired	1	0.40	At home
Other	4	1.59	At home
Socio-economic group[a,b]			
A	49	19.44	Employers/ managers
B	68	26.98	Higher professional
C	39	15.48	Lower professional
D	27	10.71	Non-manual
E	15	5.95	Manual
F	5	1.98	Manual
G	0	0.00	Manual
H	1	0.40	Other
I	5	1.98	Manual
J	1	0.40	Manual
Z	12	4.76	Other
Missing	30	11.91	
Perceived poverty[a]			
Yes	127	50.40	
No	125	49.60	
Marital status[a]			
Married	122	48.41	

Table 6.3
Demographics

	Frequency	Percentage	Collapsed
Cohabiting	50	19.84	
Separated/ divorced	8	3.18	
Widowed	0	0.00	
Single	71	28.18	
Other, not specified	1	0.40	

Note. [a] N = 252; [b] CSO, 2007: A: employers/ managers, B: higher professionals, C: lower professionals, D: non-manual, E: manual skilled, F: semi-skilled, G: unskilled, H: own account workers, I: farmers, J: agricultural workers, Z: all other gainfully occupied.

Excluded and partial versus complete cases

Table 6.14
Analyses of Variance of Excluded, Partial and Complete Cases

	Mean	F (df_M, df_R)	Effect size (ω^2)
Significant findings			
Subjective norm (N = 342)		5.17** (2, 339)	.02
Complete (N = 249)	9.28		
Partial (N = 21)	8.95		
Excluded (N = 72)	8.46		
Perceived barriers (N = 357)		8.99** (2, 354)	.04
Complete (N = 247)	2.44		
Partial (N = 38)	3.25		
Excluded (N = 75)	2.77		
Attitude (N = 334)		3.26* (2, 331)	.01
Complete (N =247)	2.56		
Partial (N = 16)	1.97		
Excluded (N = 71)	2.43		
Mental health (N = 325)		4.44* (2, 322)	.02
Complete (N = 252)	20.01		
Partial (N = 5)	16.00		
Excluded (N = 68)	20.71		
Neuroticism (N = 321)		3.21* (2, 318)	.01
Complete (N = 251)	5.85		
Partial (N = 1)	9.00		
Excluded (N = 69)	5.43		
Non-significant findings			
Age (N = 644)		0.92 (2, 641)	.00
Complete (N =252)	36.23		
Partial (N = 91)	34.85		
Excluded (N = 301)	35.29		
Intention N = 366)		2.22 (2, 363)	.01
Complete (N = 252)	4.68		
Partial (N = 38)	4.58		
Excluded (N = 76)	4.42		
Moral obligation (N = 366)		0.39 (2, 324)	.00
Complete (N = 252)	4.14		
Partial (N = 38)	4.16		
Excluded (N = 76)	4.00		
Anticipated regret (N = 327)		2.66 (2, 324)	.01
Complete (N = 225)	10.80		
Partial (N = 31)	10.81		
Excluded (N = 71)	9.69		
Perceived susceptibility (N = 364)		0.87 (2, 361)	.00
Complete (N = 251)	4.01		
Partial (N = 38)	3.91		
Excluded (N = 75)	3.83		

Table 6.14

Analyses of Variance of Excluded, Partial and Complete Cases

	Mean	F (df_M, df_R)	Effect size (ω^2)
Having got HPV vaccine (N = 361)		0.81 (2, 358)	.00
Complete (N = 249)	4.32		
Partial (N = 38)	4.08		
Excluded (N = 74)	4.30		
Unrealistic optimism (N = 364)		0.88 (2, 361)	.00
Complete (N = 252)	0.02		
Partial (N = 38)	0.13		
Excluded (N = 74)	-0.14		
Perceived severity (N = 364)		0.02 (2, 361)	-.01
Complete (N = 251)	5.39		
Partial (N = 38)	5.37		
Excluded (N = 75)	5.40		
Risk stigma (N = 346)		0.49 (2, 343)	.00
Complete (N = 251)	1.13		
Partial (N = 22)	1.18		
Excluded (N = 73)	1.19		
Perceived benefits (N = 342)		0.90 (2, 339)	.00
Complete (N = 251)	3.99		
Partial (N = 21)	3.78		
Excluded (N = 70)	3.99		
PBC (N = 343)		0.19 (2, 340)	.00
Complete (N = 246)	3.79		
Partial (N = 21)	3.71		
Excluded (N = 72)	3.78		
Information level (Pap test, N= 321)		1.19 (2, 318)	.00
Complete (N = 242)	7.43		
Partial (N = 6)	6.50		
Excluded (N = 69)	7.38		
Information Level (risk factors, N = 318)		0.99 (2, 315)	.00
Complete (N = 252)	7.50		
Partial (N = 7)	6.14		
Excluded (N = 69)	7.30		
General health motivation (N = 327)		1.44 (2, 324)	.00
Complete (N = 252)	11.31		
Partial (N = 6)	9.83		
Excluded (N = 69)	11.30		
Physical health (N = 321)		2.11 (2, 318)	.01
Complete (N = 248)	17.41		
Partial (N = 6)	15.83		
Excluded (N = 67)	17.81		
Number of lifetime sexual partners (N = 316)		0.16 (2, 313)	.01
Complete (N = 242)	5.64		
Partial (N = 6)	5.00		

Table 6.14
Analyses of Variance of Excluded, Partial and Complete Cases

	Mean	F (df_M, df_R)	Effect size (ω^2)
Excluded (N = 68)	6.09		
Number of new partners		1.17 (2, 286)	.00
in past 6 months (N = 289)			
Complete (N = 231)	0.36		
Partial (N = 2)	0.00		
Excluded (N = 56)	0.48		
Doctor – patient relationship (N = 323)		0.79 (2, 320)	.00
Complete (N = 251)	27.84		
Partial (N = 3)	25.00		
Excluded (N = 69)	27.74		
Internal HLoC (N = 318)		0.27 (2, 314)	.00
Complete (N = 247)	24.21		
Partial (N = 1)	25.00		
Excluded (N = 69)	23.84		
External HLoC (powerful others, N = 318)		1.30 (2, 315)	.00
Complete (N = 249)	15.73		
Partial (N = 1)	21.00		
Excluded (N = 68)	15.16		
External HLoC (chance, N = 317)		0.29 (1, 315)	.00
Complete (N = 248)	16.94		
Partial (N = 0)	n/a		
Excluded (N = 68)	16.64		
Spirituality (N = 321)		0.23 (2, 318)	.00
Complete (N = 251)	3.17		
Partial (N = 1)	3.00		
Excluded (N = 69)	3.07		
Openness (N = 320)		0.93 (2, 317)	.00
Complete (N = 250)	6.74		
Partial (N = 1)	9.00		
Excluded (N = 69)	6.87		
Conscientiousness (N = 321)		0.75 (2, 318)	.00
Complete (N = 251)	7.97		
Partial (N = 1)	7.00		
Excluded (N = 69)	7.72		
Extraversion (N = 319)		0.99 (2, 316)	.00
Complete (N = 249)	6.66		
Partial (N = 1)	9.00		
Excluded (N = 69)	6.59		
Agreeableness (N = 320)		1.23 (2, 317)	.00
Complete (N = 250)	7.38		
Partial (N = 1)	6.00		
Excluded (N = 69)	7.07		

Table 6.14

Analyses of Variance of Excluded, Partial and Complete Cases

	Mean	F (df_M, df_R)	Effect size (ω^2)
Impulsivity (N = 316)		0.97 (2, 313)	.00
Complete (N = 247)	17.48		
Partial (N = 1)	21.00		
Excluded (N = 68)	17.87		

Note. *p ≤ .05; **p ≤ .01

Table 6.16
Chi-Square Analysis by Participation Status

Predictor	% complete (std. residual)	% partial (std. residual)	% excluded (std. residual)	χ^2	df (N)	V[a]
Significant findings						
Age categorical				92.15**	6 (644)	.27**
< 25 years	0.00 (-5.00)	0.00 (-3.01)	100.00 (6.23)			
25-44 years	45.58 (2.19)	17.04 (1.64)	37.39 (-2.91)			
45-60 years	36.22 (-0.52)	11.02 (-0.93)	52.76 (0.99)			
> 60 years	0.00 (-0.63)	0.00 (-0.38)	100.00 (0.78)			
Education				28.79*	14 (327)	.21*
Junior certificate	80.00 (0.08)	0.00 (-0.30)	20.00 (-0.05)			
Leaving certificate	81.25 (0.19)	6.25 (1.30)	12.50 (-0.75)			
Leaving certificate (higher)	82.76 (0.35)	3.45 (0.64)	13.79 (-0.86)			
Advanced/ higher certificates	94.44 (1.46)	1.85 (0.01)	3.70 (-2.78)			
Bachelor's degree	75.00 (-0.12)	0.00 (-0.66)	25.00 (0.42)			
Bachelor's degree (hons.)/ Higher diploma	83.93 (0.59)	0.00 (-1.01)	16.07 (-0.82)			
Master's degree/ Postgrad diploma	68.63 (-0.97)	2.94 (0.83)	28.43 (1.61)			
Doctoral degree	60.98 (-1.17)	0.00 (-0.87)	39.02 (2.50)			
SES collapsed[b]				20.25**	5 (289)	.27**
Employers & managers	66.22 (-1.04)		33.78 (1.89)			
Higher professionals	70.83 (-0.67)		29.17 (1.22)			
Lower professionals	35.34 (0.62)		29.17(-1.12)			
Non-manual	96.43 (1.18)		3.57 (-2.10)			
Manual	96.30 (1.16)		3.70 (-2.10)			
Other	72.22 (-0.22)		27.78 (0.41)			

Table 6.16
Chi-Square Analysis by Participation Status

Predictor	% complete (std. residual)	% partial (std. residual)	% excluded (std. residual)	χ^2	df (N)	V[a]
Previous Pap test				41.20**	4 (410)	.22**
Yes	66.57 (1.23)	18.54 (-0.52)	14.89 (-1.70)			
No	32.61 (-2.50)	28.26 (1.30)	39.13 (3.19)			
I don't know	0.00 (-2.22)	25.00(0.33)	75.00 (3.67)			
Uptake regularity				28.19**	4 (395)	.27**
Recent Pap test	67.07 (1.04)	14.33 (-1.05)	18.60 (-0.90)			
No recent Pap test	70.59 (0.42)	5.89 (-1.09)	23.53 (0.25)			
Unscreened	30.00 (-2.91)	36.00 (3.34)	34.00 (2.06)			
Abnormal Pap test[c]				9.74*	4 (354)	.12*
Yes	72.50 (0.74)	10.00 (1.20)	17.50 (-0.36)			
No	64.50 (-0.46)	15.58 (0.59)	19.91 (0.35)			
I don't know	33.33 (-0.71)	66.67 (2.42)	0.00 (-0.75)			
Quality of the smear taker[c]				24.16**	2 (292)	.29**
Satisfied	84.38 (0.57)	0.00 (-1.32)	15.63 (-0.95)			
Not satisfied	58.33 (-1.52)	5.56 (3.53)	36.11 (2.53)			
Non-significant findings						
Exposure to cancer				6.01	4 (365)	.09
To cervical cancer	59.38 (-0.66)	15.63 (0.91)	25.00 (0.56)			
To other cancer	69.06 (0.01)	8.99 (-0.73)	21.94 (0.51)			
No	74.55 (0.49)	14.55 (0.95)	10.91 (-1.58)			

Table 6.16
Chi-Square Analysis by Participation Status

Predictor	% complete (std. residual)	% partial (std. residual)	% excluded (std. residual)	χ^2	df (N)	V[a]
Hygiene stigma				3.57	4 (346)	.07
Agree	100.00 (0.56)	0.00 (-0.44)	0.00 (-0.80)			
Disagree	71.10 (-0.30)	6.49 (0.09)	22.40 (0.50)			
I don't know	82.86 (0.72)	5.71 (-0.15)	11.43 (-1.25)			
Fear of cervical cancer				3.63	2 (345)	.10
Yes	78.63 (0.75)	5.98 (-0.05)	15.38 (-1.36)			
No	69.74 (-0.53)	6.14 (0.03)	24.12 (0.97)			
Ever reminded by doctor[d]				8.08	4 (34)	.35
Yes	64.29 (1.14)	0.00 (-1.11)	35.71 (-0.62)			
No	35.29 (-0.55)	17.65 (1.23)	47.06 (0.00)			
Not applicable	0.00 (-1.15)	0.00 (-0.51)	100.00 (1.34)			
Ever reminded by someone close[d]				3.48	4 (34)	.23
Yes	52.94 (0.55)	11.76 (0.41)	35.29 (-0.71)			
No	40.00 (-0.24)	6.67 (-0.28)	53.33 (0.35)			
Not applicable	0.00 (-0.94)	0.00 (-0.42)	100.00 (1.09)			
Ever seen a public advertisement[d]				3.72	4 (34)	.23
Yes	56.25 (0.73)	12.50 (0.50)	31.25 (-0.92)			
No	35.29 (-0.55)	5.88 (-0.41)	58.82 (0.71)			
Not applicable	0.00 (-0.66)	0.00 (-0.30)	100.00 (0.77)			
Ever seen advertisement in magazine or newspaper[d]				4.27	2 (34)	.35
Yes	50.00 (0.25)	25.00 (1.54)	25.00 (-0.91)			
No	42.31 (-0.14)	3.85 (-0.85)	53.85 (0.50)			
Not applicable	0.00 (n/a)	0.00 (n/a)	0.00 (n/a)			

Table 6.16
Chi-Square Analysis by Participation Status

Predictor	% complete (std. residual)	% partial (std. residual)	% excluded (std. residual)	χ^2	df (N)	V[a]
Ever seen received invitation from NCSP[d]				2.98	4 (34)	.21
Yes	53.33 (0.54)	6.67 (-0.28)	40.00 (-0.40)			
No	41.18 (-0.18)	11.76 (0.41)	47.06 (0.00)			
Not applicable	0.00 (-0.94)	0.00 (-0.42)	100.00 (1.09)			
Knowing anyone who discovered cervical cancer[d]				0.86	2 (34)	.16
Yes	50.00 (0.22)	16.67 (0.65)	33.33 (-0.49)			
No	42.86 (-0.10)	7.14 (-0.30)	50.00 (0.23)			
Not applicable	0.00 (n/a)	0.00 (n/a)	0.00 (n/a)			
Ever reminded herself in diary[d]				4.52	4 (34)	.26
Yes	60.00 (0.54)	0.00 (-0.66)	40.00 (-0.23)			
No	46.15 (0.16)	11.54 (0.47)	42.31 (-0.35)			
Not applicable	0.00 (-1.15)	0.00 (-0.51)	100.00 (1.34)			
Invited for Pap test				4.47	2 (345)	.11
Ever	74.83 (0.41)	5.52 (-0.58)	19.66 (-0.45)			
Never	61.82 (-0.95)	10.91 (1.33)	27.27 (1.04)			
Received invitation from[e]				5.77	8	.10
NCSP	76.50 (0.23)	5.13 (-0.40)	18.38 (-0.24)			
GP	66.67 (-0.54)	13.33 (1.73)	20.00 (0.12)			
a clinic/ hospital	75.00 (-0.00)	0.00 (-0.48)	25.00 (0.27)			
NCSP & GP	66.67 (-0.30)	0.00 (-0.72)	33.33 (0.98)			
NCSP & GP & clinic/ hospital	100.00 (0.29)	0.00 (-0.24)	0.00 (-0.44)			

Table 6.16
Chi-Square Analysis by Participation Status

Predictor	% complete (std. residual)	% partial (std. residual)	% excluded (std. residual)	χ^2	df (N)	V[a]
Social Support				4.28	2 (343)	.11
Yes	74.04 (0.30)	5.77 (-0.45)	20.19 (-0.31)			
No	58.06 (-0.95)	12.90 (1.43)	29.03 (0.98)			
Knowing about cervical cancer				0.39	2 (328)	.03
Agree	75.15 (-0.21)	2.37 (0.21)	22.49 (0.32)			
Disagree	77.99 (0.21)	1.89 (-0.21)	20.13 (-0.33)			
Occupation (collapsed)[b]				3.94	4 (257)	.12
At home	93.55 (-0.25)		6.45 (1.80)			
Professional/ manager	99.03 (0.10)		0.97 (-0.71)			
Clerical	98.39 (0.03)		1.61 (-0.19)			
Manual	100.00 (0.04)		0.00 (-0.28)			
Student	98.25 (0.02)		1.76 (-0.10)			
Perceived poverty				5.78	2 (327)	.13
Yes	75.15 (-0.28)	3.55 (1.65)	21.30 (0.06)			
No	79.11 (0.29)	0.00 (-1.71)	20.89 (-0.06)			
Health insurance				1.88	2 (327)	.08
Yes	77.78 (0.14)	1.43 (-0.50)	20.79 (-0.11)			
No	72.92 (-0.33)	4.17 (1.19)	22.92 (0.27)			

Table 6.16
Chi-Square Analysis by Participation Status

Predictor	% complete (std. residual)	% partial (std. residual)	% excluded (std. residual)	χ^2	df (N)	V[a]
Marital status				2.54	8 (326)	.06
Married	74.85 (-0.36)	1.84 (0.32)	23.31 (0.60)			
Cohabiting	80.65 (0.30)	1.61 (0.05)	17.74 (-0.59)			
Separated/ divorced	80.00 (0.10)	0.00 (-0.39)	20.00 (-0.08)			
Single	79.78 (0.27)	1.12 (-0.31)	19.10 (-0.42)			
Other, not specified	50.00 (-0.44)	0.00 (-0.18)	50.00 (0.89)			
Ever been pregnant				3.07	2 (327)	.10
Yes	80.33 (0.50)	1.09 (-0.74)	18.58 (-0.74)			
No	72.92 (-0.57)	2.78 (0.84)	24.31 (0.84)			
Taking care of children				3.87	2 (327)	.11
Yes	83.05 (0.74)	1.69 (-0.11)	15.25 (-1.38)			
No	73.68(-0.56)	1.91 (0.08)	24.40 (1.04)			
Contraceptive use				12.85	10 (326)	.14
Condoms	80.85 (0.30)	0.00 (-0.93)	19.15 (-0.30)			
Contraceptive pill	84.27 (0.78)	2.25 (0.28)	13.48 (-1.58)			
IUD	82.14 (0.31)	0.00 (-0.72)	17.86 (-0.38)			
Other	77.78 (0.04)	0.00 (-0.58)	22.22 (0.10)			
None	66.99 (-1.16)	3.88 (1.53)	29.13 (1.76)			
Not sexually active	78.05 (0.08)	0.00 (-0.87)	21.95 (0.11)			

Table 6.16
Chi-Square Analysis by Participation Status

Predictor	% complete (std. residual)	% partial (std. residual)	% excluded (std. residual)	χ^2	df (N)	V[a]
AFI				2.51	6 (323)	06
15 to 19 years	78.95 (0.32)	1.75 (-0.10)	19.30 (-0.58)			
20 to 24 years	75.00 (-0.23)	1.61 (-0.20)	23.39 (0.49)			
25 years and over	69.23 (-0.44)	3.85 (0.74)	26.92 (0.61)			
Never been sexually active	100.00 (0.38)	0.00 (-0.19)	0.00 (-0.65)			
Genital symptoms in past 5 years				3.80	2 (326)	.11
Yes	92.31 (0.89)	0.00 (-0.69)	7.69 (-1.49)			
No	75.67 (-0.26)	2.00 (0.20)	22.33 (0.44)			
Ever had an STI				1.43	2 (325)	.07
Yes	79.17 (0.11)	4.17 (1.08)	16.67 (-0.49)			
No	77.08 (-0.30)	1.33 (-0.29)	21.59 (014)			
Ever diagnosed with HPV				1.56	2 (326)	.07
Yes	80.00 (0.15)	5.00 (1.04)	15.00 (-0.60)			
No	76.80(-0.04)	1.63 (-0.27)	21.57 (0.15)			
Regular source of care				0.47	2 (325)	.04
Yes	77.24 (-0.06)	1.28 (0.08)	21.47 (0.09)			
No	84.62 (0.29)	0.00 (-0.40)	15.38 (-0.46)			
Preferred smear taker sex				7.94	4 (324)	.11
Female	76.99 (-0.09)	1.26 (0.03)	21.76 (0.15)			
Male	0.00 (-1.25)	0.00 (-0.16)	100.00 (2.41)			
No preference	80.72 (0.34)	1.20 (-0.02)	18.07 (-0.64)			

Note. [a] Cramer's V; [b] no data were available for incomplete cases; [c] question posed to screened women only; [d] question posed to unscreened women only; [e] question only posed to women who reported having received screening invitation; *p ≤ .05; **p ≤ .01.

Multiple regression

Table 6.17b
Non-significant Correlations with Intention

Predictor	r	ρ	N
Perceived susceptibility	.08	.10	251
Having got HPV vaccine	-.02	.02	249
Unrealistic optimism	-.01	.02	252
Perceived severity	-.02	0.02	251
Information level (Pap test)	.05	.04	246
Information level (risk factors)	-.01	-.02	242
Age	.02	.07	252
Mental health	-.00	.03	252
Physical health	-.09	-.02	248
Number of lifetime sexual partners	.06	.05	242
Number of new partners in past 6 months	.05	.06	231
Doctor – patient relationship	.06	.10	251
Internal HLoC	.05	.05	247
External HLoC (powerful others)	.02	.06	249
External HLoC (chance)	-.10	-.10	248
Spirituality	.04	.01	251
Openness	.04	.07	250
Neuroticism	.04	-.03	251

Note.

Table 6.18b
Non-Significant Analysis of Dichotomous Predictors of Intention

Mann-Whitney	N	Median	Mean Rank	U (z)	Effect size (r)
Age				4631.50 (-0.38)	-.02
25-44 years	206	5.00	125.98		
45-60 years	46	5.00	128.82		
Fear of cervical cancer				7223.50 (-0.26)	-.02
Yes	92	5.00	125.02		
No	159	5.00	126.57		
Ever invited for Pap test				3317.50 (-1.50)	-.09
Yes	217	5.00	127.71		
No	34	5.00	115.07		
Information level (cervical cancer)				7832.00 (-0.12)	-.01
Agree	127	5.00	125.67		
Disagree	124	5.00	126.34		
Perceived poverty				7849.00 (-0.24)	-0.2
Yes	127	5.00	127.20		
No	125	5.00	125.79		
Ever been pregnant				7187.00 (-1.48)	-.09

Table 6.18b

Non-Significant Analysis of Dichotomous Predictors of Intention

Yes	147	5.00	130.11		
No	105	5.00	121.45		
Caring for children younger than 12 years				7217.50 (-0.93)	-.06
Yes	98	5.00	129.85		
No	154	5.00	124.37		
Preferred sex of smear taker[a]				6048.00 (-0.36)	-.02
Female	184	5.00	126.63		
No preference	67	5.00	124.27		

Kolmogorov-Smirnov				Z	
Social support				0.29	.02
Yes	231	5.00			
No	18	5.00			
Genital symptoms in past 5 years				0.14	.01
Yes	24	5.00			
No	227	5.00			
Ever had an STI				0.45	.03
Yes	19	5.00			
No	232	5.00			
Ever diagnosed with HPV				0.37	.02
Yes	16	5.00			
No	235	5.00			
Regular source of care				0.71	.04
Yes	241	5.00			
No	11	5.00			

Note. [a] N male = 0.

Table 6.19b

Non-Significant Analyses of Variance in Differences in Intention

	Mean	F (df_M, df_R)	Effect size (ω^2)
Previous abnormal Pap test[a] (N = 237)		0.48 (2, 234)	.00
Yes (N = 87)	4.79		
No (N = 149)	4.70		
I don't know (N = 1)	5.00		
Exposure to cancer (N = 252)		0.21 (2, 249)	-.01
To cervical cancer (N = 19)	4.58		
To other cancer (N = 192)	4.68		
None (N = 41)	4.73		
Hygiene stigma (N = 251)		0.07 (2, 248)	-.01
Agree (N = 3)	4.67		
Disagree (N = 219)	4.68		
I don't know (N = 29)	4.62		
Invited by (N = 209)		0.19 (4, 204)	-.02

Table 6.19b

Non-Significant Analyses of Variance in Differences in Intention

	Mean	F (df_M, df_R)	Effect size (ω^2)
NCSP (N = 179)	4.69		
GP (N = 20)	4.75		
a clinic/ hospital (N = 3)	5.00		
NCSP & GP (N = 6)	4.83		
NCSP & GP & clinic/ hospital (N =1)	5.00		
Education (N = 252)		0.66 (7, 244)	-.01
Junior certificate (N = 4)	5.00		
Leaving certificate (N = 13)	4.77		
Leaving certificate (higher) (N = 24)	4.38		
Advanced/ higher certificates (N = 51)	4.76		
Bachelor's degree (N = 18)	4.78		
Bachelor's degree (hons.)/ higher diploma (N = 47)	4.70		
Master's degree/ postgrad diploma (N = 70)	4.66		
Doctoral degree (N = 25)	4.64		
Occupation (collapsed, N =252)		1.65 (4, 247)	.01
At home (29)	4.55		
Professional/ manager (N = 102)	4.75		
Clerical (N = 61)	4.79		
Manual (N = 4)	5.00		
Student (N = 56)	4.46		
SES (collapsed, N = 222)		0.75 (5, 216)	-.01
Employers/ managers (N = 49)	4.69		
Higher professionals (N = 68)	4.74		
Lower professionals (N = 39)	4.77		
Non-manual (N = 27)	4.74		
Manual (N = 26)	4.46		
Other (N = 13)	4.92		
Marital status (N 252)		0.88 (4, 247)	.00
Married (N = 122)	4.74		
Cohabiting (N = 50)	4.76		
Separated/ divorced (N = 8)	4.50		
Single (N = 71)	4.54		
Other (N = 1)	5.00		
Contraceptive use (N = 251)		1.66 (5, 245)	.01
Condoms (N = 38)	4.71		
Contraceptive pill (N = 75)	4.71		
IUD (N = 23)	4.83		
Other (N = 14)	4.36		
None (N = 69)	4.80		
Not sexually active (N = 32)	4.38		

Note. [a] question answered by screened women only; *p ≤ .1,** p ≤ .05;*** p ≤ .01.

Tables 6.28 and 6.29, below, assess outliers and influential cases. Fourteen cases had standardised residuals greater than one standard deviation (|SD| = |1.96|. Of these five cases had standardised residuals greater than two standard deviations and three cases had standard residuals greater than three standard deviations. Compared to the acceptable numbers of outliers presented by Field (2009), there are three outliers too many in the sample. Four cases had values greater than the conservative cut-off for the centred leverage value suggested by Field and two cases exceeded the very conservative critical value (= 22.59 for five predictors when N = 200, see Barnett & Lewis, 1978) for the Mahalanobis distance. These findings suggest the intention scores of these outliers might affect the intention scores predicted by the model; however, no case reached the cut-off value for Cook's distance (= 1, see Field, 2009).

In addition, the covariance ratio (CVR) suggests that deleting the 11 cases with the lowest CVR values would improve the precision of the model; however, none of the standardised differences in the β-values of the predictors exceeded the cut-off value of 1 (Field, 2009), which would suggest an undue influence. Two cases appear to influence the fit of the model with standardised differences of fit exceeding 1 (Field, 2009).

The scatterplot in figure 6.3, below, suggests that heteroscedacity was present and the difference in predicted and actual intention scores varied less among cases with higher intention scores. The normality plot in Figure 6.4, below, shows that the standardised residuals deviate significantly from the normal distribution, which is confirmed by a significant K-S test: $D(210) = .32$, $p \leq .001$.

Furthermore, the Durbin-Watson statistic for the final model is 2.06 which means the assumption of independent errors has been met (Field, 2009). Table 6.26 shows the collinearity statistics: the VIF is greater than 1.1 only for attitude and all tolerances are larger than 0.2. Based on R^2 (= .30) the effect size was $f^2 = .42$. To determine such an effect at $\alpha = .05$ and statistical power of $1-\beta = .80$ a sample size of Nrequ = 42 would be needed; the sample included in this analysis (N = 210) is therefore sufficient. $1-\beta$ for N = 210 is 1.00.

Table 6.28

Casewise Diagnostics

Case	Std. Residual	Reported Intention score	Predicted Intention score	Residual	Cook's Distance	Mahalanobis Distance	Leverage	Covariance Ratio
77	-4.495	1	4.31	-3.308	.08	5.59	.03	.45
79	-2.557	3	4.88	-1.882	.05	11.43	.05	.84
84	-2.343	3	4.72	-1.724	.06	14.08	.07	.88
117	-2.470	2	3.82	-1.818	.07	15.01	.07	.86
119	-2.818	3	5.07	-2.074	.02	3.40	.02	.77
137	-4.928	1	4.63	-3.627	.14	7.79	.04	.37
152	-2.331	2	3.72	-1.716	.08	18.08	.09	.90
153	-2.437	2	3.79	-1.794	.05	11.39	.05	.86
159	-5.331	1	4.92	-3.924	.07	3.20	.02	.31
167	-2.056	2	3.51	-1.513	.06	18.48	.09	.95
169	2.265	5	3.33	1.667	.12	28.29	.14	.95
177	-2.279	3	4.68	-1.677	.03	7.65	.04	.87
180	-2.279	3	4.68	-1.677	.02	5.15	.02	.86
187	-3.144	1	3.31	-2.314	.19	24.10	.12	.75

Note.

Table 6.29

Standardised Difference of β-values

Case	Standardized DFBETA Constant	Standardized DFBETA C[a]	Standardized DFBETA Extraversion	Standardized DFBETA Agreeableness	Standardized DFBETA AFI[b]	Standardized DFBETA Previous Pap Test	Standardized DFBETA Health Insurance	Standardized DFBETA Attitude	Standardized DFFIT
77	-.35	.60	.03	-.31	-.13	.24	.20	.38	-.87
79	-.11	.52	-.41	-.04	.02	.02	.07	-.07	-.67
84	-.37	-.09	-.08	.12	.62	.03	-.01	-.16	-.69
117	.20	-.23	-.29	-.07	-.03	.08	-.41	.46	-.75
119	.17	-.17	-.22	-.12	-.03	.02	.07	.00	-.42
137	.14	.24	.37	-.27	.04	.05	-.91	-.32	-1.13
152	-.17	-.09	.42	.37	-.12	.09	-.34	.18	-.78
153	-.17	-.07	.24	-.12	-.16	.20	.15	.52	-.64
159	-.09	-.37	.47	.40	-.21	.07	.21	-.21	-.83
167	.22	.19	-.03	-.26	-.08	-.51	.04	.15	-.70
169	.20	-.34	.38	.31	.10	-.24	-.15	-.83	1.00
177	.16	-.12	-.12	.14	.02	-.03	-.39	-.10	-.49
180	-.10	.04	-.15	.32	-.07	.01	.10	.01	-.41
187	.26	-.28	-.07	.73	-.25	-.92	.15	.26	-1.27

Note. [a]Conscientiousness, [b]Age at first intercourse.

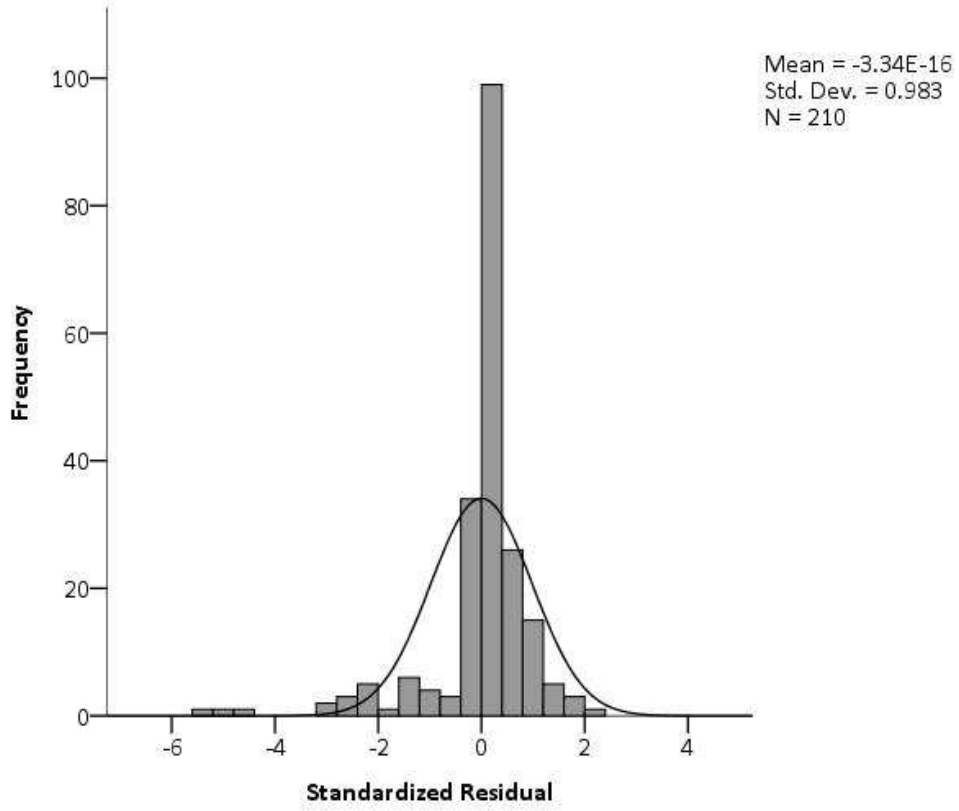

Figure 6.3. Distribution of the standardized residuals

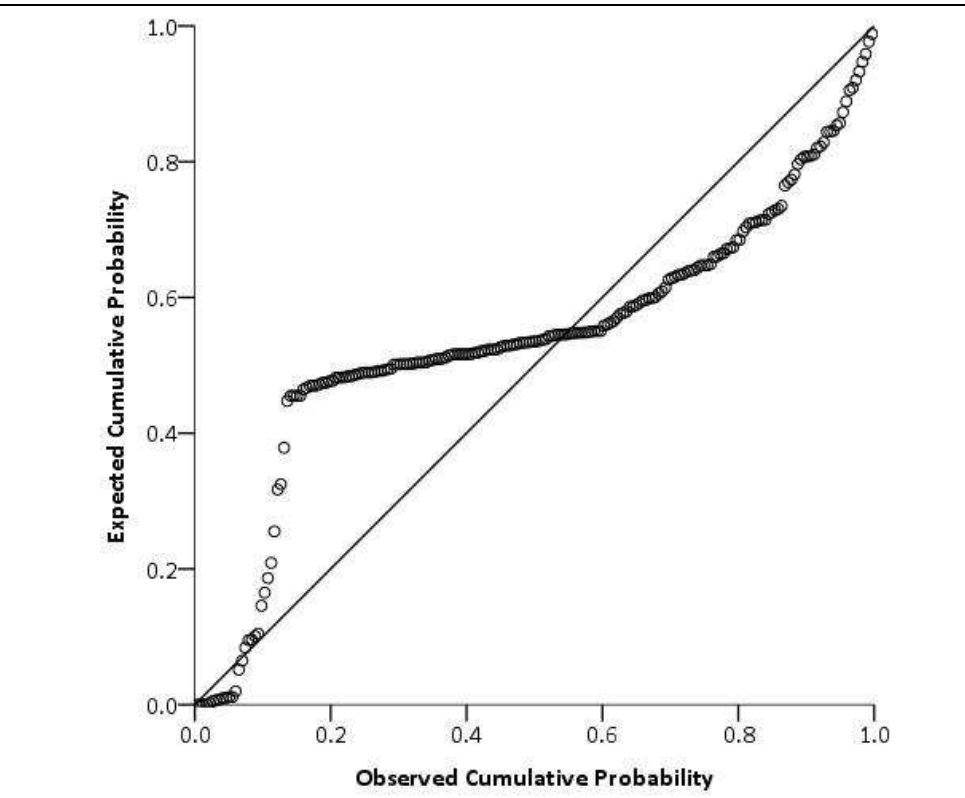

Figure 6.4. Normality plot of the standardized residuals

Multinomial logistic regression

Table 6.30
Chi-Square Analysis by Uptake Regularity

Predictor	% regular (std. residual)	% irregular (std. residual)	% unscreened (std. residual)	χ^2	df (N)	V[a]
Significant findings						
Hygiene stigma				11.11**	4 (246)	.15**
Agree	66.67 (-0.41)	0.00 (-0.38)	3.33 (1.91)			
Disagree	91.12 (0.33)	3.74 (-0.76)	13.05 (-0.57)			
I don't know	75.86 (-0.75)	13.79 (2.17)	10.35 (0.93)			
Ever invited for a Pap test				20.12***	2 (205)	.30***
Yes	92.49 (0.54)	3.76 (-0.74)	3.76 (-1.38)			
No	66.67 (-1.36)	12.12 (1.88)	21.21 (3.52)			
Occupation (collapsed)				28.42**	8 (247)	.24**
At home	96.55 (0.43)	3.45 (-0.34)	0.00 (-1.33)			
Professional/ manager	94.00 (0.52)	4.00 (-0.39)	2.00 (-1.65)			
Clerical	93.22 (0.34)	3.39 (-0.51)	3.39 (-0.84)			
Manual	100.00 (0.23)	0.00 (-0.44)	0.00 (-0.49)			
Student	70.91 (-1.43)	9.09 (1.42)	20.00 (4.19)			
Quality of their smear taker[b]				25.78***	1 (232)	.33***
Satisfied	97.16 (0.35)	2.84 (-1.49)				
Not satisfied	71.43 (-1.10)	28.57 (4.71)				
Non-significant findings						
Age				4.44	2 (247)	.13
25-44 years	87.19 (-0.28)	5.42 (0.36)	7.39 (0.76)			
45-60 years	97.73 (0.61)	2.27 (-0.78)	0.00 (-1.64)			

Table 6.30
Chi-Square Analysis by Uptake Regularity

Predictor	% regular (std. residual)	% irregular (std. residual)	% unscreened (std. residual)	χ^2	df (N)	V[a]
Abnormal Pap test[b]				2.27	2 (232)	.10
Yes	97.65 (0.27)	2.35 (-1.14)				
No	93.15 (-0.21)	6.85 (0.89)				
I don't know	100.00 (0.05)	0.00 (-0.23)				
Exposure to cancer				4.22	4 (247)	.13
Yes, to cervical cancer	100.00 (0.49)	0.00 (-0.94)	0.00 (-1.05)			
Yes, to other cancer	87.83 (-0.18)	4.76 (-0.60)	7.41 (0.74)			
None	90.00 (0.06)	7.50 (0.76)				
Fear of cervical cancer				4.30	2 (246)	.13
Yes	94.44 (0.55)	2.22 (-1.41)	3.33 (-1.06)			
No	85.90 (-0.41)	6.41 (0.87)	7.69 (0.81)			
Invited by[c]				5.00	8 (205)	.11
NCSP	93.75 (-0.41)	2.27 (-0.51)	3.98 (0.50)			
GP	84.21 (-0.41)	10.53 (1.94)	5.26 (0.30)			
Clinic/ hospital	100.00 (0.12)	0.00 (-0.30)	0.00 (-0.34)			
NCSP & GP	100.00 (0.17)	0.00 (-0.42)	0.00 (-0.48)			
NCSP & GP & clinic/ hospital	100.00 (0.07)	0.00 (-0.72)	0.00 (-0.20)			
Social support				3.79	2 (244)	.13
Yes	89.82 (0.14)	4.87 (-0.03)	5.31 (-0.51)			
No	77.78 (-0.50)	5.56 (0.12)	16.67 (1.80)			
Information level (cervical cancer)				2.10	2 (246)	.09
Agree	86.29 (-0.32)	5.65 (0.39)	8.07 (0.89)			
Disagree	91.80 (0.33)	4.10 (-0.39)	4.10 (-0.89)			

Table 6.30
Chi-Square Analysis by Uptake Regularity

Predictor	% regular (std. residual)	% irregular (std. residual)	% unscreened (std. residual)	χ^2	df (N)	V[a]
Education				6.64	14 (247)	.12
Junior certificate	100.00 (0.23)	0.00 (-0.44)	0.00 (-0.49)			
Leaving certificate	92.31 (-0.08)	7.69 (0.46)	0.00 (-0.89)			
Leaving certificate (higher)	87.50 (-0.08)	4.17 (-0.15)	8.33 (0.45)			
Advanced/ higher certificates	87.76 (-0.10)	5.12 (0.40)	6.12 (0.01)			
Bachelor's degree	83.33 (-0.10)	11.11 (1.20)	5.56 (-0.09)			
Bachelor's degree (hons.)/ Higher diploma	86.67 (-0.17)	2.22 (-0.80)	11.11 (1.37)			
Master's degree/ Postgrad diploma	91.30 (0.20)	4.35 (-0.19)	4.35 (-0.58)			
Doctoral degree	92.00 (0.16)	4.00 (-0.20)	4.00 (-0.42)			
SES collapsed				11.23	10 (218)	.16
Employers & managers	89.58 (-0.12)	4.17 (0.01)	6.25 (0.54)			
Higher professionals	95.59 (0.37)	1.47 (-1.08)	2.94 (-0.63)			
Lower professionals	94.60 (0.37)	2.70 (-0.43)	2.70 (-0.54)			
Non-manual	84.62 (-0.36)	11.54 (1.86)	3.85 (-0.18)			
Manual	80.77 (-0.56)	7.69 (0.89)	11.54 (1.66)			
Other	100.00 (0.33)	0.00 (-0.73)	0.00 (-0.77)			
Perceived poverty				0.36	2 (247)	.04
Yes	88.00 (-0.13)	5.60 (0.38)	6.40 (0.15)			
No	90.16 (0.13)	4.10 (-0.38)	5.74 (-0.15)			
Health insurance				0.74	2 (247)	.06
Yes	88.73 (-0.05)	4.70 (-0.11)	6.57 (0.30)			
No	91.18 (0.13)	5.88 (0.27)	2.94 (-0.74)			

Table 6.30
Chi-Square Analysis by Uptake Regularity

Predictor	% regular (std. residual)	% irregular (std. residual)	% unscreened (std. residual)	χ^2	df (N)	V[a]
Marital status				14.33	8 (247)	.17
Married	95.80 (0.78)	2.52 (-1.16)	1.68 (-1.94)			
Cohabiting	79.59 (-0.70)	8.16 (1.05)	12.25 (1.75)			
Separated/ divorced	100.00 (0.33)	0.00 (-0.62)	0.00 (-0.70)			
Single	82.86 (-0.55)	7.14 (0.87)	10.00 (1.33)			
Other, not specified	100.00 (0.12)	0.00 (-0.22)	0.00 (-0.25)			
Ever been pregnant				4.11	2 (247)	.13
Yes	91.67 (0.33)	4.86 (0.00)	3.47 (-1.27)			
No	85.44 (-0.39)	4.85 (-0.00)	9.71 (1.50)			
Taking care of children				1.18	2 (247)	.07
Yes	90.72 (0.17)	5.16 (0.13)	4.12 (-0.78)			
No	88.00 (-0.14)	4.67 (-0.11)	7.33 (0.63)			
Contraceptive use				9.27	10 (246)	.14
Condoms	91.89 (0.19)	2.70 (-0.60)	5.41 (-0.17)			
Contraceptive pill	83.78 (-0.48)	6.76 (0.73)	9.46 (1.17)			
IUD	95.46 (0.32)	4.55 (-0.07)	0.00 (-1.16)			
Other	92.86 (0.15)	7.14 (0.38)	0.00 (-0.92)			
None	94.03 (0.43)	2.99 (-0.70)	2.99 (-1.03)			
Not sexually active	81.25 (-0.47)	6.25 (0.35)	12.50 (1.47)			

Table 6.30
Chi-Square Analysis by Uptake Regularity

Predictor	% regular (std. residual)	% irregular (std. residual)	% unscreened (std. residual)	χ^2	df (N)	V[a]
AFI				8.77	6 (244)	.13
15-19 years	90.23 (0.11)	3.76 (-0.41)	6.02 (-0.06)			
20-24 years	90.11 (0.08)	4.40 (-0.05)	5.50 (-0.25)			
25 years and over	83.33 (-0.27)	11.11 (1.32)	5.56 (-0.10)			
Never been sexually active	50.00 (-0.59)	0.00 (-0.30)	50.00 (2.50)			
Genital symptoms in past 5 years				3.09	2 (246)	.11
Yes	87.50 (-0.08)	0.00 (-1.08)	12.50 (1.27)			
No	89.19 (0.03)	5.41 (0.36)	5.41 (-0.42)			
Ever had an STI				1.10	2 (246)	.07
Yes	94.74 (0.26)	0.00 (-0.96)	5.26 (-0.15)			
No	88.55 (-0.08)	5.29 (0.28)	6.17 (0.04)			
Ever diagnosed with HPV				1.97	2 (246)	.09
Yes	100.00 (0.45)	0.00 (-0.86)	0.00 (-0.96)			
No	88.31 (-0.12)	5.20 (0.22)	6.49 (0.24)			
Regular source of care				3.55	2 (247)	.12
Yes	89.83 (0.12)	4.66 (-0.14)	5.51 (-0.35)			
No	72.73 (-0.57)	9.09 (0.64)	18.18 (1.63)			
Preferred sex of smear taker[d]				.71	2 (247)	.05
Female	88.33 (-0.11)	5.56 (0.42)	6.11 (0.02)			
Male						
No preference	91.05 (0.17)	2.99 (-0.70)	5.97 (-0.03)			

Note. [a] Cramer's V; [b] question posed to screened women only; [c] question posed to women who reported having received a screening invitation; [d] no-one selected *male* as their preference; *p ≤ .10; **p ≤ .05; ***p ≤ .01.

Table 6.31
Kruskal-Wallis Test of Difference Between Regular, Irregular and Non-screeners

	H[a]	Median	Mean Rank
Significant findings			
Age	20.20***		
Regular (N = 220)		35.50	129.78
Irregular (N = 12)		35.50	117.58
Unscreened (N = 15)		27.00	44.40
Intention	32.95***		
Regular (N = 220)		5.00	129.60
Irregular (N = 12)		3.50	70.92
Unscreened (N = 15)		5.00	82.93
Moral obligation	18.14***		
Regular (N = 220)		5.00	129.96
Irregular (N = 12)		4.00	84.67
Unscreened (N = 15)		4.00	68.10
Anticipated regret	14.86***		
Regular (N = 194)		12.00	116.38
Irregular (N = 12)		7.50	55.83
Unscreened (N = 14)		9.50	75.82
Perceived susceptibility	6.90**		
Regular (N = 219)		4.00	126.04
Irregular (N = 12)		3.25	72.63
Unscreened (N = 15)		4.00	127.07
Perceived barriers	18.08***		
Regular (N = 216)		2.21	116.07
Irregular (N = 12)		3.04	138.29
Unscreened (N = 15)		3.79	194.33
Perceived benefits	24.92***		
Regular (N = 219)		4.00	131.04
Irregular (N = 12)		3.21	38.75
Unscreened (N = 15)		3.57	81.23
Attitude	11.72***		
Regular (N = 215)		3.00	125.61
Irregular (N = 12)		3.00	100.71
Unscreened (N = 15)		2.50	79.17
Subjective norms	17.24***		
Regular (N = 217)		10.00	125.05
Irregular (N = 12)		8.00	63.58
Unscreened (N = 15)		10.00	132.77
Information level (Pap test)	9.60***		
Regular (N = 217)		7.00	127.11
Irregular (N = 12)		7.00	98.38
Unscreened (N = 15)		6.00	75.07
Mental health	5.10*		
Regular (N = 220)		21.00	123.07
Irregular (N = 12)		18.50	90.96
Unscreened (N = 15)		22.00	153.07

Table 6.31
Kruskal-Wallis Test of Difference Between Regular, Irregular and Non-screeners

	H[a]	Median	Mean Rank
Non-significant findings			
Having got HPV vaccine	1.76		
Regular (N = 217)		5.00	124.30
Irregular (N = 12)		4.50	106.04
Unscreened (N = 15)		5.00	109.60
Unrealistic optimism	3.75		
Regular (N = 220)		0.00	126.21
Irregular (N = 12)		0.00	92.79
Unscreened (N = 15)		0.00	116.50
Perceived severity	1.04		
Regular (N = 219)		5.00	124.30
Irregular (N = 12)		5.50	129.25
Unscreened (N = 15)		5.00	107.27
PBC	2.21		
Regular (N = 218)		4.00	124.25
Irregular (N = 12)		4.00	119.83
Unscreened (N = 15)		4.00	107.43
Risk stigma	1.03		
Regular (N = 219)		1.00	124.07
Irregular (N = 12)		1.00	114.50
Unscreened (N = 15)		1.00	122.40
General health motivation	1.75		
Regular (N = 220)		12.00	126.07
Irregular (N = 12)		11.50	107.21
Unscreened (N = 15)		11.00	107.13
Information level (risk factors)	2.60		
Regular (N = 210)		8.00	121.08
Irregular (N = 12)		7.50	89.08
Unscreened (N = 15)		8.00	75.07
Physical health	1.29		
Regular (N = 217)		18.00	121.12
Irregular (N = 11)		18.00	114.09
Unscreened (N = 15)		19.00	140.57
Number of lifetime sexual partners	1.79		
Regular (N = 213)		4.00	121.87
Irregular (N = 11)		3.00	113.41
Unscreened (N = 15)		2.00	98.27
Number of new partners in past 6 months	1.28		
Regular (N = 201)		0.00	115.42
Irregular (N = 11)		0.00	102.32
Unscreened (N = 15)		0.00	103.50
Doctor – patient relationship	0.59		
Regular (N = 219)		28.00	124.53
Irregular (N = 12)		27.50	108.92
Unscreened (N = 15)		27.00	120.17

Table 6.31

Kruskal-Wallis Test of Difference Between Regular, Irregular and Non-screeners

	H[a]	Median	Mean Rank
Internal HLoC	2.26		
Regular (N = 215)		24.00	122.49
Irregular (N = 12)		22.50	93.13
Unscreened (N = 15)		25.00	130.03
External HLoC (powerful others)	4.43		
Regular (N = 217)		16.00	125.83
Irregular (N = 12)		14.00	98.92
Unscreened (N = 15)		15.00	93.23
External HLoC (chance)	1.88		
Regular (N = 217)		17.00	120.67
Irregular (N = 12)		18.50	148.42
Unscreened (N = 15)		16.00	128.23
Spirituality	3.51		
Regular (N = 219)		3.00	124.18
Irregular (N = 12)		3.00	91.50
Unscreened (N = 15)		4.00	139.20
Openness	4.30		
Regular (N = 218)		7.00	122.52
Irregular (N = 12)		8.00	157.67
Unscreened (N = 15)		5.00	102.30
Conscientiousness	4.36		
Regular (N = 219)		8.00	126.76
Irregular (N = 12)		7.00	99.25
Unscreened (N = 15)		7.00	95.33
Extraversion	3.46		
Regular (N = 217)		7.00	125.38
Irregular (N = 12)		6.50	103.79
Unscreened (N = 15)		6.00	95.77
Agreeableness	2.99		
Regular (N = 218)		8.00	123.45
Irregular (N = 12)		6.50	93.88
Unscreened (N = 15)		8.00	139.70
Neuroticism	0.42		
Regular (N = 219)		6.00	122.92
Irregular (N = 12)		6.00	136.17
Unscreened (N = 15)		6.00	121.83
Impulsivity	1.46		
Regular (N = 215)		17.00	121.55
Irregular (N = 12)		18.00	139.21
Unscreened (N = 15)		16.00	106.60

Note. [a] df = 2 for all tests; * p ≤ .10, ** p ≤ .05, *** p ≤ .01.

Table 6.32

Post Hoc Analyses of Difference Between Regular, Irregular and Non-Screeners

Predictor	Z	p	Effect size (r)
Age			
Regular vs irregular	0.63	.65	.04
Regular vs unscreened	2.20*	.00	.14
Irregular vs unscreened	1.38	.02	.27
Intention			
Regular vs irregular	1.60*	.00	.11
Regular vs unscreened	1.34*	.00	.09
Irregular vs unscreened	0.47	.68	.09
Moral obligation			
Regular vs irregular	1.30*	.02	.09
Regular vs unscreened	2.14*	.00	.14
Irregular vs unscreened	0.47	.68	.09
Anticipated regret			
Regular vs irregular	1.39*	.02	.10
Regular vs unscreened	1.44	.07	.08
Irregular vs unscreened	0.79	.39	.15
Perceived susceptibility			
Regular vs irregular	1.38*	.01	.09
Regular vs unscreened	0.37	.86	.02
Irregular vs unscreened	1.25	.03	.07
Perceived barriers			
Regular vs irregular	1.00	.19	.07
Regular vs unscreened	1.98*	.00	.13
Irregular vs unscreened	1.33	.04	.26
Perceived benefits			
Regular vs irregular	2.09*	.00	.14
Regular vs unscreened	1.39*	.01	.09
Irregular vs unscreened	0.99	.14	.19
Attitude			
Regular vs irregular	0.87	.08	.06
Regular vs unscreened	1.32*	.01	.09
Irregular vs unscreened	0.52	.72	.10
Subjective norms			
Regular vs irregular	1.72*	.00	.11
Regular vs unscreened	0.24	.85	.02
Irregular vs unscreened	1.38*	.01	.27
Information level (Pap test)			
Regular vs irregular	0.97	.07	.06
Regular vs unscreened	1.33	.02	.09
Irregular vs unscreened	0.95	.12	.18
Mental health			
Regular vs irregular	0.99	.14	.07
Regular vs unscreened	1.11	.07	.07
Irregular vs unscreened	1.38*	.02	.27

Note. *p ≤ .02.

Table 6.35
Step 2: Multinomial Regression of Risk Factors

					95% CI	
Regular vs		B	SE	OR	Lower	Upper
Irregular	Intercept	0.22	1.89			
	Age	0.02	0.04	1.02	0.94	1.11
	Occupation					
	At home	-1.29	1.19	0.28	0.03	2.82
	Professional/ manager	-1.08	0.77	0.34	0.08	1.53
	Clerical	-1.29	1.02	0.28	0.04	2.03
	Manual	-17.72	0.00	$2.01E^{-8}$	$2.01E^{-8}$	$2.01E^{-8}$
	Student[a]					
	Mental health	-0.15	0.08	0.86	0.74	1.00
Unscreened	Intercept	2.34	3.45			
	Age	-0.23*	0.10	0.80	0.66	0.96
	Occupation					
	At home	-16.84	3722.88	$4.84E^{-8}$	0.00	[b]
	Professional/ manager	-1.81*	0.86	0.17	0.03	0.89
	Clerical	-0.80	0.90	0.45	0.08	2.64
	Manual	-17.43	8201.96	$2.69E^{-8}$	0.00	[b]
	Student[a]					
	Mental health	0.14	0.11	1.15	0.93	1.42

Note. N = 214; R^2 = .16 (Cox & Snell), .27 (Nagelkerke), .19 (McFadden); Model $\chi^2(12) = 37.32$, $p \leq .001$; Goodness-of-fit $\chi^2(368) = 436.16$ (Pearson), $p \leq .01$, 133.66 (Deviance), non-sig.; * $p \leq .05$; [a] reference category; [b] system missing.

Table 6.36
Step 3a: Multinomial Regression of Information Levels

					95% CI	
Regular vs		B	SE	OR	Lower	Upper
Irregular	Intercept	2.61	2.47			
	Age	0.02	0.04	1.02	0.94	1.10
	Occupation					
	At home	-1.20	1.21	0.30	0.03	3.23
	Professional/ manager	-0.97	0.78	0.38	0.08	1.74
	Clerical	-1.24	1.01	0.29	0.04	2.11
	Manual	-17.45	0.00	$2.63E^{-8}$	$2.63E^{-8}$	$2.63E^{-8}$
	Student[a]					
	Mental health	-0.15	0.08	0.86	0.74	1.01
	Information level (Pap test)	-0.33	0.23	0.72	0.46	1.13

Table 6.36
Step 3a: Multinomial Regression of Information Levels

Regular vs		B	SE	OR	95% CI Lower	95% CI Upper
Unscreened	Intercept	-2.56	3.98			
	Age	-0.23*	0.10	0.80	0.65	0.97
	Occupation					
	At home	-16.64	3598.49	$5.94E^{-8}$	0.00	[b]
	Professional/ manager	-1.77*	0.88	0.17	0.03	0.95
	Clerical	-1.14	0.95	0.32	0.50	2.06
	Manual	-17.05	8237.74	$3.95E^{-8}$	0.00	[b]
	Student[a]					
	Mental health	0.14	0.11	1.15	0.93	1.43
	Information level (Pap test)	-0.47	0.25	0.63	0.39	1.01

Note. N = 214; R^2 = .18 (Cox & Snell), .31 (Nagelkerke), .22 (McFadden); Model $\chi^2(14) = 43.01$, $p \leq .001$; Goodness-of-fit $\chi^2(398) = 421.98$ (Pearson), non-sig., 140.10 (Deviance), non-sig.; * $p \leq .05$; [a] reference category; [b] system missing.

Table 6.37
Step 3b: Multinomial Regression of EVT Constructs

Regular vs		B	SE	OR	95% CI Lower	95% CI Upper
Irregular	Intercept	65.70	35.54			
	Age	0.80	0.08	1.08	0.93	1.26
	Occupation					
	At home	9.27	5.58	10606.95	0.19	$591.85E^{6}$
	Professional/ manager	0.33	2.03	1.38	0.03	74.57
	Clerical	3.78	3.22	43.94	0.08	24104.39
	Manual	-2.93	2289.20	0.05	0.00	[b]
	Student[a]					
	Mental health	-1.07	0.59	0.34	0.11	1.09
	Intention	-3.19*	1.55	0.04	0.00	0.86
	Moral obligation	4.24	2.43	69.41	0.60	8080.91
	Anticipated regret	-0.47	0.33	0.63	0.33	1.19
	Perceived susceptibility	-3.60	2.08	0.03	0.00	1.60
	Perceived barriers	1.21	0.95	3.36	0.52	21.71
	Perceived benefits	-7.67*	3.77	0.00	$2.91E^{-7}$	0.75
	Attitude	2.76*	1.40	15.75	1.00	246.97
	Subjective norms	-1.59	0.94	0.21	0.03	1.30
	Hygiene stigma					
	Agree	-14.73	0.00	$4.01E^{-7}$	$4.01E^{-7}$	$4.01E^{-7}$
	Disagree	-7.69	4.21	0.00	$1.21E^{-7}$	1.74

Table 6.37
Step 3b: Multinomial Regression of EVT Constructs

				95% CI	
Regular vs	B	SE	OR	Lower	Upper
Don't know[a]					
Invited for Pap test					
Ever	-5.62*	2.79	0.00	$1.54E^{-5}$	0.85
Never[a]					
Unscreened					
Intercept	-5.74	7.54			
Age	-0.25*	0.12	0.78	0.62	0.98
Occupation					
At home	-13.25	1267.52	$1.75E^{-6}$	0.00	[b]
Professional/ manager	-2.11	1.19	0.12	0.01	1.25
Clerical	-0.78	1.41	0.46	0.04	7.24
Manual	-12.73	3324.04	$2.97E^{-6}$	0.00	[b]
Student[a]					
Mental health	0.31	0.19	1.36	0.94	1.98
Intention	-0.64	0.40	0.53	0.24	1.16
Moral obligation	-0.55	0.36	0.58	0.29	1.17
Anticipated regret	-0.22	0.17	0.81	0.57	1.13
Perceived susceptibility	0.74	0.59	2.10	0.66	6.64
Perceived barriers	1.09*	0.54	2.96	1.02	8.58
Perceived benefits	0.71	0.97	2.04	0.31	13.57
Attitude	0.08	0.60	1.01	0.31	3.24
Subjective norms	0.37	0.31	1.45	0.79	2.65
Hygiene stigma					
Agree	2.76	2.13	15.78	0.24	1022.40
Disagree	-0.63	1.07	0.53	0.07	4.36
Don't know[a]					
Invited for Pap test					
Ever	-0.32	1.08	0.73	0.09	6.07
Never[a]					

Note. N = 214; R^2 = .44 (Cox & Snell), .74 (Nagelkerke), .64 (McFadden); Model $\chi^2(34) = 132.95$, $p \leq .001$; Goodness-of-fit $\chi^2(392) = 125.91$ (Pearson), non-sig., 70.25 (Deviance), non-sig.; * $p \leq .05$; [a] reference category; [b] system missing.

Table 6.38
Step 3: Multinomial Regression—Final Model

				95% CI			
Regular vs	B	SE	OR	Lower	Upper	Tol.[a]	VIF
Irregular							
Intercept	13.95	4.47					
Age	0.02	0.05	1.02	0.92	1.14	.88	1.13
Occupation						.80	1.25
At home	-0.23	1.60	0.80	0.04	18.30		
Professional/ manager	-0.22	1.05	0.80	0.10	6.30		
Clerical	0.29	1.32	1.33	0.10	17.79		
Manual	15.56	0.00	$1.75E^{-7}$	$1.75E^{-7}$	$1.75E^{-7}$		
Student[b]							
Mental health	-0.24*	0.10	0.79	0.65	0.96	.99	1.01
Intention	-1.16*	0.45	0.31	0.13	0.75	.78	1.28
Perceived barriers	0.28	0.41	1.33	0.60	2.95	.75	1.34
Perceived benefits	-2.94*	0.76	0.05	0.01	0.24	.77	1.30
Attitude	1.28*	0.60	3.60	1.11	11.68	.59	1.68
Invited for Pap test						.99	1.11
Ever	-1.85	0.95	0.16	0.02	1.02		
Never[b]							
Unscreened							
Intercept	-0.45	4.69					
Age	-0.14	0.08	0.87	0.75	1.02	.88	1.13
Occupation						.80	1.25
At home	-17.29	5372.67	$3.09E^{-9}$	0.00	[c]		
Professional/ manager	-1.93	1.03	0.15	0.02	1.10		
Clerical	-0.38	1.07	0.68	$5.22E^{-8}$	$5.22E^{-8}$		
Manual	-16.77	0.00					
Student[b]							
Mental health	0.23	0.15	1.26	0.95	1.67	.99	1.01
Intention	-0.88*	0.36	0.42	0.20	0.85	.78	1.28
Perceived barriers	0.81*	0.39	2.24	1.05	4.78	.75	1.34
Perceived benefits	0.00	0.67	1.00	0.27	3.71	.77	1.30
Attitude	0.20	0.50	1.22	0.45	3.26	.59	1.68
Invited for Pap test						.99	1.11
Ever	-1.15	0.83	0.32	0.06	1.59		
Never[b]							

Note. N = 214; R^2 = .34 (Cox & Snell), .57 (Nagelkerke), .46 (McFadden); Model $\chi^2(22) = 89.24$, $p \leq .001$; Goodness-of-fit $\chi^2(404) = 237.88$(Pearson), non-sig., 104.96 (Deviance), non-sig.; * $p \leq .05$; [a] tolerance statistic;[b] reference category; [c] system missing.

Table 6.41

Step 3b: Multinomial Regression of EVT Constructs Without Occupation

				95% CI	
Regular vs	B	SE	OR	Lower	Upper
Irregular					
Intercept	27.24	8.50			
Age	0.09	0.07	1.10	0.96	1.25
Mental health	-0.40*	0.17	0.67	0.48	0.93
Intention	-1.90*	0.65	0.15	0.04	0.53
Moral obligation	1.57*	0.78	4.78	1.05	21.88
Anticipated regret	-0.25	0.21	0.78	0.51	1.18
Perceived susceptibility	-1.35	0.71	0.26	0.07	1.04
Perceived barriers	0.63	0.67	1.87	0.50	7.00
Perceived benefits	-3.49*	1.16	0.03	0.00	0.30
Attitude	1.75*	0.83	5.73	1.13	29.18
Subjective norms	-0.65*	0.31	0.52	0.29	0.95
Hygiene stigma					
Agree	-18.49	0.00	9.36^{-9}	9.36^{-9}	9.36^{-9}
Disagree	-3.45	1.81	0.03	0.00	1.10
Don't know[a]					
Invited for Pap test					
Ever	-2.67*	1.23	0.07	0.01	0.77
Never[a]					
Unscreened					
Intercept	-2.77	6.36			
Age	-0.31*	0.12	0.73	0.58	0.93
Mental health	0.20	0.15	1.23	0.91	1.65
Intention	-0.61	0.39	0.55	0.25	1.18
Moral obligation	-0.46	0.33	0.63	0.33	1.19
Anticipated regret	-0.24	0.16	0.79	0.57	1.08
Perceived susceptibility	0.89	0.60	2.44	0.75	7.92
Perceived barriers	1.13*	0.49	3.08	1.18	8.05
Perceived benefits	0.79	0.88	2.21	0.40	12.30
Attitude	-0.01	0.58	0.99	0.32	3.11
Subjective norms	0.30	0.29	1.35	0.77	2.39
Hygiene stigma					
Agree	2.57	1.95	13.08	0.29	591.48
Disagree	-1.01	0.99	0.36	0.05	2.51
Don't know[a]					
Invited for Pap test					
Ever	-0.18	1.00	0.83	0.12	5.95
Never[a]					

Note. N = 216; R^2 = .41 (Cox & Snell), .69 (Nagelkerke), .59 (McFadden); Model $\chi^2(26) = 114.52$, $p \leq .001$; Goodness-of-fit $\chi^2(404) = 227.96$ (Pearson), non-sig, 80.20 (Deviance), non-sig; * $p \leq .05$; [a] reference category.

Despite the exclusion of occupation the Pearson and Deviance chi-squares are in disagreement over goodness-of-fit. Over-dispersion may be an issue in this final model, because of the large number of variables in the final model. In contrast to the regression of socio-economic status (cf. tables 33 and 34), there are no very large standard errors in the final model. Without occupation three additional variables were significant predictors of uptake regularity and this larger number of variables increased the number of empty cells from 428 in the model with occupation to 470 in the model without occupation.

The model without occupation, however, has higher R^2-values and classified 93.19 percent of cases correctly, while the model with occupation correctly classified 90.65 percent. Tables 6.38 and 6.42 further show that most of the standard errors and confidence intervals increase when occupation is eliminated; however, the decrease in Akaike's and the Bayesian information criteria for the entire model and each predictor (see table 6.43 below) suggests further that the model without occupation is a better fit. Table 6.43 also shows that the likelihood ratio test for occupation is insignificant, which indicates that occupation is not a significant predictor in that model. A comparison of the likelihood ratio tests with and without occupation in the model shows that fewer variables are redundant when occupation is excluded.

Finally, the VIF and tolerances of either model suggest that this analysis is not affected by multicollinearity.

Table 6.43
Likelihood Ratio Tests

	Final Model with Occupation				Final Model without Occupation			
	Model Fitting Criteria		Likelihood Ratio Tests		Model Fitting Criteria		Likelihood Ratio Tests	
Predictor	AIC[a]	BIC[b]	χ^2	df	AIC	BIC	χ^2	df
Intercept	152.96	233.74	0.00	0	144.19	220.30	0.00	0
Age	154.03	228.08	5.07	2	153.02	222.21	12.83*	2
Mental health	160.41	234.46	11.45*	2	153.49	222.68	13.30*	2
Information level (Pap test)[c]					145.59	214.68	5.29	2
Intention	161.29	235.34	12.33*	2	149.60	218.14	9.41*	2
Moral Obligation[c]					143.95	213.14	3.75	2
Perceived barriers	154.11	228.16	5.15	2	144.88	214.07	4.68	2
Perceived benefits	173.37	247.42	24.41*	2	164.73	233.92	24.54*	2
Attitude	154.47	228.52	5.51	2	146.36	215.55	6.17*	2

Table 6.43
Likelihood Ratio Tests

	Final Model with Occupation				Final Model without Occupation			
	Model Fitting Criteria		Likelihood Ratio Tests		Model Fitting Criteria		Likelihood Ratio Tests	
Predictor	AIC[a]	BIC[b]	χ^2	df	AIC	BIC	χ^2	df
Subjective norm[c]					147.29	216.48	7.09*	2
Invited for Pap test	153.96	228.01	5.00	2	146.78	215.97	6.58*	2
Occupation	142.42	196.27	5.46	8	excluded			
Entire model	152.96	233.74	89.24*	22	144.19	220.30	104.52*	20

Note. * $p \leq .05$; [a] Akaike's information criterion; [b] Bayesian information criterion; [c] not predictive in model with occupation.

Interaction and mediation

Table 6.44

Multiple Regression of Intention With Interaction Term

Predictor	B	SE	β	Part correlation
Step 1				
Constant	3.51	0.38		
Conscientiousness	0.05	0.04	.11	.10
Extraversion	0.07	0.03	.13	.13
Agreeableness	0.04	0.04	.08	.08
Step 2				
Constant	4.05	0.61		
Conscientiousness	0.05	0.04	.09	.09
Extraversion	0.04	0.03	.09	.08
Agreeableness	0.05	0.03	.09	.09
AFI	0.33	0.22	.10	.10
Previous Pap test	-0.95	.23	-.27*	-.27
Step 3				
Constant	3.85	0.58		
Conscientiousness	0.03	0.03	.05	.05
Extraversion	0.01	0.03	.03	.03
Agreeableness	0.02	0.03	.05	.04
AFI	0.23	0.20	.07	.07
Previous Pap test	-0.68	0.21	-.20**	-.19
Health insurance	-0.29	0.14	-.12*	-.12
Attitude	0.38	0.06	.41***	.38
Step 4				
Constant	5.00	.66		
Conscientiousness	0.03	.03	.05	.05
Extraversion	0.01	.03	.02	.02
Agreeableness	0.02	.03	.04	.04
AFI	0.21	.19	.06	.06
Previous Pap test	-1.55	.34	-.45***	-.26
Health insurance	-0.28	.14	-.12*	-.11
Attitude	-0.17	.17	-.18	-.05
Pap test—attitude interaction	0.46	.14	.62**	.19

Note. N = 210; R^2 = .05, F-ratio = 3.22 ($p \leq .05$) for Step1; R^2 = .13, ΔR^2 = .09 F = 10.06 ($p \leq .001$) for Step 2; R^2 = .30, ΔR^2 = .17 ($p \leq .001$), F = 24.99 ($p \leq .001$) for Step 3; R^2 = .34, ΔR^2 = .04 ($p \leq .001$), F = 10.60 ($p \leq .001$) for Step 4; *$p \leq .05$, **$p \leq .01$, $p \leq .001$.

Table 6.46

Mediation Analysis of the Association of Attitude and Intention

	Outcome							
	Moral obligation		Anticipated regret		Perceived barriers		Risk stigma	
Predictor	B	SE	B	SE	B	SE	B	SE
Constant	2.97***	.24	8.08***	.70	3.84***	.19	1.38***	.09
Attitude	0.46***	.09	1.08***	.26	-0.53***	.07	-0.11**	.03
Moral obligation	---	---	---	---	---	---	---	---
Anticipated regret	---	---	---	---	---	---	---	---
Perceived barriers	---	---	---	---	---	---	---	---
Risk stigma	---	---	---	---	---	---	---	---
Perceived benefits	---	---	---	---	---	---	---	---
PBC	---	---	---	---	---	---	---	---
General health motivation	---	---	---	---	---	---	---	---
Conscientiousness	---	---	---	---	---	---	---	---
Extraversion	---	---	---	---	---	---	---	---
Agreeableness	---	---	---	---	---	---	---	---
	R^2 = .11		R^2 = .08		R^2 = .22		R^2 = .04	
	F(1, 208) = 25.93***		F(1, 208) = 17.48***		F(1, 208) = 59.06***		F(1, 208) = 9.19**	

Note. * p ≤ .05, ** p ≤ .01, *** p ≤ .001.

Table 6.46
Mediation Analysis of the Association of Attitude and Intention (continued)

	Outcome							
	Perceived benefits		PBC		General health motivation		Conscientiousness	
Predictor	B	SE	B	SE	B	SE	B	SE
Constant	3.22***	.11	3.35***	.11	9.70***	.42	7.30***	.33
Attitude	0.30***	.05	0.17***	.04	0.62***	.16	0.26*	.12
Moral obligation	---	---	---	---	---	---	---	---
Anticipated regret	---	---	---	---	---	---	---	---
Perceived barriers	---	---	---	---	---	---	---	---
Risk stigma	---	---	---	---	---	---	---	---
Perceived benefits	---	---	---	---	---	---	---	---
PBC	---	---	---	---	---	---	---	---
General health motivation	---	---	---	---	---	---	---	---
Conscientiousness	---	---	---	---	---	---	---	---
Extraversion	---	---	---	---	---	---	---	---
Agreeableness	---	---	---	---	---	---	---	---
	R^2 = .17		R^2 = .07		R^2 = .07		R^2 = .02	
	F(1, 208) = 43.34***		F(1, 208) = 16.38***		F(1, 208) = 15.95***		F(1, 208) = 4.51*	

Note. * p ≤ .05, ** p ≤ .01, *** p ≤ .001.

Table 6.46

Mediation Analysis of the Association of Attitude and Intention (continued)

	Outcome							
	Extraversion		Agreeableness		Intention: Direct effect		Intention: Total effect	
Predictor	B	SE	B	SE	B	SE	B	SE
Constant	5.74***	.34	6.78***	.34	3.51***	.15	2.67***	.69
Attitude	0.35**	.13	0.22	.13	0.46***	.06	0.37***	.07
Moral obligation	---	---	---	---	---	---	0.09	.05
Anticipated regret	---	---	---	---	---	---	0.00	.02
Perceived barriers	---	---	---	---	---	---	0.02	.06
Risk stigma	---	---	---	---	---	---	-0.13	.11
Perceived benefits	---	---	---	---	---	---	0.09	.09
PBC	---	---	---	---	---	---	-0.04	.09
General health motivation	---	---	---	---	---	---	0.02	.03
Conscientiousness	---	---	---	---	---	---	0.01	.04
Extraversion	---	---	---	---	---	---	0.03	.03
Agreeableness	---	---	---	---	---	---	0.02	.03
	R^2 = .04		R^2 = .01		R^2 = .24		R^2 = .28	
	F(1, 208) = 7.76**		F(1, 208) = 2.96		F(1, 208) = 67.04***		F(11, 198) = 6.99***	

Note. * p ≤ .05, ** p ≤ .01, *** p ≤ .001.

Appendix E

7. Increasing positive attitude to strengthen screening intentions

Participant recruitment material

Figure 7.1. Intervention advertisement

Data collection questionnaire

Cervical Screening Study

Welcome!

Welcome to the Cervical Screening Study,
This short survey is part of my doctoral research project which examines the predictors of screening uptake. It takes no more than 15 minutes to complete--and there's a chance to win a €20 one-4-all voucher at the end!

If you are 23 or 24 years old and living in Ireland, I would much appreciate if you completed my survey.

More questions? Please email me at m.kotzur@ucc.ie or give me a call: 021 490 4522.

Thank you so much for you help,
Marie Kotzur
- - - - - -
PhD Candidate
School of Applied Psychology
University College Cork
Ireland

Before we start I want to assure you that your participation is entirely voluntary and you can choose to exit the study at any time.
All your responses are anonymous and confidential and I will store them securely. Your answers will be collated with those of other participants and won't be published individually or in combination with any personally identifying information.
You can withdraw your data from the study up to the point when you press 'Submit' at the end of the survey.

Some parts of this survey address potentially sensitive issues, but they are not expected to leave you feeling distressed. If you feel that you would like to talk to someone, please contact your GP or the Irish Samaritans if you want to talk to somebody right away: 1850 60 90 90 (helpline) or http://www.samaritans.org/how-we-can-help-you/contact-us

If you have any further questions about cervical smears, you might find the following web pages helpful:

http://www.cancer.ie/reduce-your-risk-hpv-and-cervical-cancer
http://www.cervicalcheck.ie/
http://www.irishhealth.com/article.html?id=2928

Please, indicate below that you have understood the above and agree to take part in this study.*

( ) I understand that my participation is voluntary and that the information I provide is anonymous and confidential.

Inclusion Criteria

1) Please indicate your sex.

( ) female ( ) male

2) Please state your age (in years).

_____

3) Were you born in the Republic of Ireland?

( ) yes ( ) no

4) Have you ever lived outside the Republic of Ireland for more than 1 year?

( ) yes ( ) no

5) Please select the highest level of education that you have completed.

( ) less than Junior Certificate	( ) Leaving Certificate with higher level courses	( ) Honours Bachelor Degree or Higher Diploma
( ) Junior Certificate	( ) Advanced and/ or Higher Certificates	( ) Masters Degree or Postgraduate Diploma
( ) Leaving Certificate	( ) Bachelor Degree	( ) Doctoral Degree

6) Have you ever had a hysterectomy?

( ) yes ( ) no ( ) I don't know

7) Cervical screening is recommended to all women aged 25 years and older. It uses a procedure called the Pap test or smear test. Have you ever had a Pap test?[9]

( ) yes ( ) no ( ) I don't know

---

[9] Participants who are not aged 23 or 24 years, were not born in Ireland, have lived outside Ireland for more than one year or have had a Pap test or a hysterectomy will be redirected to a thank-you page reading:

I'm very sorry, but I'm specifically looking for women who are 23 or 24 years old, have lived in Ireland only and have never had a Pap test before.
This is not to say that your views don't matter, but it's the only way I can check external and cultural effects in my data.
Nevertheless, I thank you very much for interest in my research,
Marie Kotzur.

Before we begin...

Please enter the last four digits of your phone number. These will be used as an identifier for your data. Your participation will remain anonymous.*

_____

What do you think of the Pap test?

The questions below ask about your opinion of the Pap test, so there are no right or wrong answers. Just select the first option that appears accurate to you.

9) How likely is it that you will attend for a Pap test when you are 25?

( ) 1 – extremely likely	( ) 4	( ) 7
( ) 2	( ) 5	( ) 8
( ) 3	( ) 6	( ) 9 – extremely unlikely

10) For you, how would it be to have a Pap test when you are 25?

( ) +3: good		( ) -1
( ) +2	( ) 0	( ) -2
( ) +1		( ) -3: bad

11) For you, how would it be to have a Pap test when you are 25?

( ) +3: wise		( ) -1
( ) +2	( ) 0	( ) -2
( ) +1		( ) -3: foolish

12) For you, how would it be to have a Pap test when you are 25?

( ) +3: beneficial		( ) -1
( ) +2	( ) 0	( ) -2
( ) +1		( ) -3: harmful

13) For you, how would it be to have a Pap test when you are 25?

( ) +3: favourable		( ) -1
( ) +2	( ) 0	( ) -2
( ) +1		( ) -3: unfavourable

14) My having a Pap test when I'm 25 would...

	-3 – extremely unlikely	**-2**	**-1**	**0**	**+1**	**+2**	**+3 – extremely likely**
Give me a sense of relief to find nothing amiss							
Make me feel embarrassed with the smear taker							
Mean any cancer would be found in the early stages							
Cause me to worry until told the results							
Give me reassurance about cervix cancer							
Mean any cancer found would be curable							
Be physically unpleasant							

15) For you, how bad or good would any of these outcomes be?

	-3 – extremely bad	**-2**	**-1**	**0**	**+1**	**+2**	**+3 – extremely good**
Give me a sense of relief to find nothing amiss							
Make me feel embarrassed with the smear taker							
Mean any cancer would be found in the early stages							
Cause me to worry until told the results							
Give me reassurance about cervix cancer							

	-3 – extremely bad	-2	-1	0	+1	+2	+3 – extremely good
Mean any cancer found would be curable							
Be physically unpleasant							

16) Please indicate how much you agree with the following statements.

	1 – strongly disagree	2	3	4	5	6	7 – strongly agree
The Pap test will be too time-consuming.							
The Pap test will be embarrassing for me.							
I will be likely to forget to get this screening done.							
I will be fearful of the results of the Pap test.							
Having to get a Pap test will make me anxious.							
Getting the results from the Pap test will make me anxious.							
I will be fearful of the possible pain associated with the Pap test.							
I would not feel confident that getting a Pap test would prevent cervical cancer.							
The Pap test will make me feel psychologically uncomfortable.							
The Pap test will make me feel physically uncomfortable.							

	1 – strongly disagree	2	3	4	5	6	7 – strongly agree
I don't know where I could go if I wanted a Pap test when I'm 25.							
The Pap test is too expensive.							
I will feel humiliated by participating in cervical screening.							
The sex of the smear taker will be a barrier to me having a Pap test.							

17) Please indicate how much you agree with the following statements.

	1 – strongly disagree	2	3 – neutral	4	5 – strongly agree
When I get a Pap test when I'm 25, I will feel good about myself.					
When I have regular Pap tests when I'm 25, I won't worry as much about cervical cancer.					
Having regular Pap tests when I'm 25 will allow me to feel healthy and relaxed for the future.					
The Pap test will help prevent cancer.					
The Pap test will help find something wrong you can't see.					
The Pap test will help you take control of your health.					
The Pap test will help you protect your health.					

18) How do you feel about your health?

	1 – not at all	2	3	4	5	6	7 – extremely
In general how interested are you in your own health?							
In general how careful are you with your own health?							

19) I see myself as someone who...

	1 – strongly disagree	2	3	4	5 – strongly agree
... tends to find fault with others.					
... does a thorough job.					
... is reserved.					
... is relaxed, handles stress well.					
... has an active imagination.					
... is generally trusting.					
... tends to be lazy.					
... is outgoing, sociable.					
... gets nervous easily.					
... has few artistic interests.					

Screening for cervical cancer

Please watch the video below and then continue with the survey.

Screening for cervical cancer

Please watch the video below and then continue with the survey.

Screening for cervical cancer

Please watch the video below and then continue with the survey.

Screening for cervical cancer

Please read the material below and then continue with the survey.[10]

A few more questions...

Last section! Again, there are no right or wrong answers. Just select the first that seems appropriate.

20) Has this experience changed your attitude to the Pap test?

( ) +3: Yes, a lot more positive
( ) +2
( ) +1
( ) 0
( ) -1
( ) -2
( ) -3: Yes, a lot more negative

21) Please explain how your attitude has changed:

_____

22) Has this experience changed your intention to get a Pap test when you are 25?

( ) 1 – Yes, I'm a lot more likely to obtain a Pap test now.
( ) 2
( ) 3
( ) 4
( ) 5
( ) 6
( ) 7
( ) 8
( ) 9 – Yes, I'm a lot less likely to obtain a Pap test now.

23) Please explain how your intention has changed:

_____

Thank You!

That's it!

I would like to collect some more information for this study in a few weeks' time. And there's the prize draw of course!
If you would like to participate in the draw to win a €20 one-4-all voucher, or to be contacted for follow-up, or both, please follow this link to provide your email address anonymously: http://tinyurl.com/youremail[11]

Thank you for taking my survey.
Your help is very important to me. I'm researching ways to encourage more young

[10] Please see Section 3 for the video scripts and reading material.
[11] See Email Address Form below.

women to obtain a Pap test. I consider this test to be a very important step in the prevention of cervical cancer. If you can think of any friends or relatives who might like to take part in this study, please let them know about my work.
If any part of my study has left you feeling distressed, please contact your GP or the Irish Samaritans, if you would like to talk someone right away: 1850 60 90 90 (helpline) or http://www.samaritans.org/how-we-can-help-you

If you have any further questions about cervical smears, you might find the following web pages helpful:

http://www.cancer.ie/reduce-your-risk-hpv-and-cervical-cancer
http://www.cervicalcheck.ie/
http://www.irishhealth.com/article.html?id=2928

If you have any further questions about this study, please do not hesitate to contact me at 021 490 4522 or m.kotzur@ucc.ie

Thanks again,
Marie.
- - - - - -
PhD Candidate
School of Applied Psychology
University College Cork
Ireland

Email Address Form

Contact Details

This form collects your email address independently of your answers to the Cervical Screening Study, which you have just completed. Your email address cannot be linked to your questionnaire answers in order to guarantee your anonymity and the confidentiality of your answers. To be contacted
a) for follow-up or
b) to take part in the prize draw or
c) both, please leave your email address below.

1) Email address:_____

[ ] I do not wish to be contacted for follow-up.

[ ] I do not wish to participate in the prize draw.

Thank You!

Thank you,
I will be in touch in a few weeks' time.
Marie.

Cervical Screening Study: Follow-up

Hello again!

Thank you very much for coming back,

I would just like to ask you a few more questions regarding the Cervical Screening Study which you took part in two weeks ago.

Before we start I want to assure you that your participation is entirely voluntary and you can choose to exit the study at any time.
All your responses are anonymous and confidential and I will store them securely. Your answers will be collated with those of other participants and won't be published individually or in combination with any personally identifying information.
You can withdraw your data from the study up to the point when you press 'Submit' at the end of the survey.

Some parts of this survey address potentially sensitive issues, but they are not expected to leave you feeling distressed. If you feel that you would like to talk to someone, please contact your GP or the Irish Samaritans if you want to talk to somebody right away: 1850 60 90 90 (helpline) or http://www.samaritans.org/how-we-can-help-you/contact-us

If you have any further questions about cervical smears, you might find the following web pages helpful:

http://www.cancer.ie/reduce-your-risk-hpv-and-cervical-cancer
http://www.cervicalcheck.ie/
http://www.irishhealth.com/article.html?id=2928

For more information about the study, please email me at m.kotzur@ucc.ie or give me a call: 021 490 4522.

Thank you again for your help,
Marie Kotzur

- - - - - -
PhD Candidate
School of Applied Psychology
University College Cork
Ireland

Please, indicate below that you have understood the above and agree to take part in this study.

( ) I understand that my participation is voluntary and that the information I provide is anonymous and confidential.

Before we begin...

Please enter the last four digits of your phone number. They must be the same four digits you entered in the initial study, so I can match your information. Your participation will remain anonymous.

_____

What do you think of the Pap test?

1) How likely is it that you will attend for a Pap test when you are 25?

( ) 1 – extremely likely	( ) 4	( ) 7
( ) 2	( ) 5	( ) 8
( ) 3	( ) 6	( ) 9 – extremely unlikely

2) For you, how would it be to have a Pap test when you are 25?

( ) +3: good		( ) -1
( ) +2	( ) 0	( ) -2
( ) +1		( ) -3: bad

3) For you, how would it be to have a Pap test when you are 25?

( ) +3: wise		( ) -1
( ) +2	( ) 0	( ) -2
( ) +1		( ) -3: foolish

4) For you, how would it be to have a Pap test when you are 25?

( ) +3: beneficial		( ) -1
( ) +2	( ) 0	( ) -2
( ) +1		( ) -3: harmful

5) For you, how would it be to have a Pap test when you are 25?

( ) +3: favourable		( ) -1
( ) +2	( ) 0	( ) -2
( ) +1		( ) -3: harmful

6) My having a Pap test when I'm 25 would...

	-3 – extremely unlikely	**-2**	**-1**	**0**	**+1**	**+2**	**+3 – extremely likely**
Give me a sense of relief to find nothing amiss							
Make me feel embarrassed with the smear taker							
Mean any cancer would be found in the early stages							
Cause me to worry until told the results							
Give me reassurance about cervix cancer							
Mean any cancer found would be curable							
Be physically unpleasant							

7) For you, how bad or good would any of these outcomes be?

	-3 – extremely bad	**-2**	**-1**	**0**	**+1**	**+2**	**+3 – extremely good**
Give me a sense of relief to find nothing amiss							
Make me feel embarrassed with the smear taker							
Mean any cancer would be found in the early stages							
Cause me to worry until told the results							
Give me reassurance about							

	-3 – extremely bad	**-2**	**-1**	**0**	**+1**	**+2**	**+3 – extremely good**
cervix cancer							
Mean any cancer found would be curable							
Be physically unpleasant							

8) Please indicate how much you agree with the following statements.

	1 – strongly disagree	**2**	**3**	**4**	**5**	**6**	**7 – strongly agree**
The Pap test will be too time-consuming.							
The Pap test will be embarrassing for me.							
I will be likely to forget to get this screening done.							
I will be fearful of the results of the Pap test.							
Having to get a Pap test will make me anxious.							
Getting the results from the Pap test will make me anxious.							
I will be fearful of the possible pain associated with the Pap test.							
I would not feel comfortable that getting this test would prevent cervical cancer							
The Pap test will make me feel psychologically uncomfortable.							

	1 – strongly disagree	2	3	4	5	6	7 – strongly agree
The Pap test will make me feel physically uncomfortable.							
I don't know where I could go if I wanted a Pap test when I'm 25.							
The Pap test is too expensive.							
I will feel humiliated by participating in cervical screening.							
The sex of the smear taker will be a barrier to me having a Pap test.							

9) Please indicate how much you agree with the following statements.

	1 – strongly disagree	2	3 – neutral	4	5 – strongly agree
When I get a Pap test when I'm 25, I will feel good about myself.					
When I have regular Pap tests when I'm 25, I won't worry as much about cervical cancer.					
Having regular Pap tests when I'm 25 will allow me to feel healthy and relaxed for the future.					
The Pap test will help prevent cancer.					
The Pap test will help find something wrong you can't see.					
The Pap test will help you take control of your health.					

	1 – strongly disagree	2	3 – neutral	4	5 – strongly agree
The Pap test will help you protect your health.					

10) Anything else you would like to let me know?

_____

_____

Thank You!

That's it for now!

Thank you for completing this follow-up. Your help is very important to me.

If any part of my study has left you feeling distressed, please contact your GP or the Irish Samaritans, if you would like to talk someone right away: 1850 60 90 90 (helpline) or http://www.samaritans.org/how-we-can-help-you

If you have any further questions about cervical smears, you might find the following web pages helpful:

http://www.cancer.ie/reduce-your-risk-hpv-and-cervical-cancer
http://www.cervicalcheck.ie/
http://www.irishhealth.com/article.html?id=2928

If you have any further questions about this study, please do not hesitate to contact me at 021 490 4522 or m.kotzur@ucc.ie

Thanks again,
Marie.

- - - - - -
PhD Candidate
School of Applied Psychology
University College Cork
Ireland

Intervention material

Information video

Script 1

Cervical cancer is caused by some forms of the Human Papillomavirus or HPVs. These viruses are transmitted during sexual acts and cause inflammations of the mouth, the anus, the penis and the cervix. Condoms protect only partially from infection with HPV, so infection is very common. About 80 percent of the sexually active population have or have had a HPV infection. There is no medical treatment available, but often the body can clear the infection by itself.

Script 2

Persistent HPV infections can develop into cervical cancer. If discovered early, it may be possible to treat the cancer by removing the cervix or the entire womb. This procedure requires a hospital stay of at least two nights and can cause infertility. If the tumour has already spread to tissue outside the cervix, radio- or chemotherapy may be required to treat it. These have many side effects, because they can also damage healthy tissue surrounding the cancer. Nausea is common during chemotherapy. Other side effects are pain from the radiation device, diarrhoea, incontinence and osteoporosis in the pelvis. Some of these effects can occur long after the treatment is completed. In severe cases the cancer may spread to other organs and may not be treatable.

Script 3

Risk factors for cervical cancer include sexual behaviour conducive to infection with HPV, such as unprotected sexual intercourse, having had multiple sexual partners, having intercourse with a partner who has had multiple sexual partners and having first sexual intercourse at an early age, that is in adolescence. Taking the contraceptive pill and giving birth to many children are also risk factors for a HPV infection as well as smoking. A HPV infection is necessary for cervical cancer to develop.

Script 4

HPV infections have no symptoms. When symptoms occur the infection has often turned cancerous already. The only way of finding a HPV infection is the cervical smear or Pap test.

For a Pap test a swab is taken of cells lining the cervix. For this the nurse or doctor inserts a speculum into the vagina and takes the swab with a cotton bud or a special brush. In the laboratory the swabbed cells are checked for signs of inflammation or abnormal cells. Women with minor abnormal cells may just be observed by 6-monthly Pap test, as the body might clear the infection by itself. If the cells are not cleared or the abnormality has already progressed further, the woman is referred to colposcopy and the inflammation treated surgically. This is a minor procedure that requires no over-night stay in the hospital.

Attitude video and reading condition

Script 1

Hi, my name is Sarah, I'm 25 and I just had my first smear, cause when you're over 25 you don't have to pay for it. It was no big deal at all. I was a bit scared at the start, but the nurse was really nice. She explained everything to me and that helped me relax. It didn't hurt at all. And it was over really quickly as well. It's totally a routine thing for nurses like. I think the idea of it was much worse than the thing itself, but it wouldn't bother me at all now to go again the next time.

Script 2

Hi, my name is Anne. I'm 25 and I had my first smear test two weeks ago… I went to my GP for it and it was really quick. It was no bother at all. When it was over, it was over, there wasn't any pain or anything like that. Honestly it was so quick, when she finished I couldn't believe it, I was asking her 'Oh! Are we finished already!?' It was completely fine. They send you out the results in the post. I got it back and everything was fine. It was all good. I'm still glad I got a chance to go, because I want to be healthy and have a family when I'm older. I didn't really think they were gonna find anything anyway, but it's still peace of mind for me to know.

Script 3

Hi, my name is Claire, I'm 26. So I only went for my first smear test recently. I just didn't really get the time before. The test itself was fine. It was maybe a little bit embarrassing, but I think it might have saved my life. I got the results back in the post and they'd found something, but it wasn't cancer yet. And you know, I suppose I had to go back for treatment. But the treatment itself, it wasn't too bad and I actually, you

know, I could go home straight afterwards. To be honest, I'm really glad that I got it done! It's not a nice feeling of course, but the alternative isn't great either.

Script 4

I'm Laura, I'm 25. Hi! I went for my first smear test maybe a month ago. It was grand, and it took no time at all. I smoke and I'm on the pill, so I was really happy to get the all-clear. And everything was fine, so it was well worth it. It gives you great relief anyway and it's free… It was like what? Two minutes awkwardness, and then reassurance for three years. You're supposed to go every three years. I'll definitely go again.

Sample characteristics

Table 7.4
Distribution of Personality Characteristics

	Mean (SD)	Median	Normality[a]
Age (N = 92)	23.29 (0.46)	23.00	.45**
Attitude video (N =19)	23.26 (0.45)	23.00	.46**
Information video (N = 21)	23.38 (0.50)	23.00	.40**
Reading (N = 20)	23.40 (0.50)	23.00	.39**
No-treatment (N = 32)	23.19 (0.40)	23.00	.49**
Personality: BFI			
Openness (N = 91)	7.18 (1.85)	8.00	.20**
Attitude video (N =18)	7.56 (1.38)	8.00	.26**
Information video (N =21)	7.52 (1.97)	8.00	.26**
Reading (N =20)	7.40 (1.82)	8.00	.23**
No-treatment (N =32)	6.59 (1.97)	6.00	.15
Conscientiousness (N = 91)	7.09 (1.70)	7.00	.14**
Attitude video (N =18)	7.39 (1.61)	7.00	.21*
Information video (N = 21)	7.00 (1.82)	7.00	.19
Reading (N = 20)	7.35 (1.79)	7.00	.13
No-treatment (N =32)	6.81 (1.64)	6.50	.19
Extraversion(N = 92)	6.10 (1.98)	6.00	.12**
Attitude video (N =19)	6.16 (1.54)	6.00	.20
Information video (N = 21)	5.95 (2.50)	6.00	.13
Reading (N = 20)	6.50 (2.11)	6.50	.16
No-treatment (N = 32)	5.91 (1.79)	6.00	.17*
Agreeableness (N = 92)	7.55 (1.70)	8.00	.18**
Attitude video (N =19)	7.37 (1.54)	7.00	.14
Information video (N =21)	7.81 (1.66)	8.00	.31**
Reading (N = 20)	7.40 (1.35)	8.00	.17
No-treatment (N = 32)	7.50 (2.03)	7.50	.24**
Neuroticism (N = 92)	6.52 (1.89)	6.00	.16**
Attitude video (N = 19)	6.58 (1.90)	6.00	.27**
Information video(N = 21)	6.67 (1.96)	6.00	.25**
Reading (N = 20)	6.30 (2.23)	6.00	.18
No-treatment (N = 32)	6.91 (1.65)	7.00	.15
General health motivation (N = 92)	10.76 (2.01)	11.00	.14**
Attitude video (N =19)	11.11 (2.11)	12.00	.19
Information video (N =21)	11.00 (2.30)	11.00	.21*
Reading (N =20)	10.55 (1.70)	10.50	.17
No-treatment (N = 32)	10.53 (1.98)	10.50	.15

Note. [a] K-S test; * $p \leq .05$, ** $p \leq .01$.

Table 7.5
Analyses of Variance in Differences in Sample Characteristics

	F (df_M, df_R)	p	Effect size (ω^2)
Age	1.23 (3, 88)	.31	.01
Openness	5.66 (3, 87)	.18	.02
Conscientiousness	0.64 (3, 87)	.59	-.01
Extraversion	0.41 (3, 88)	.75	-.02
Agreeableness	0.28 (3, 88)	.84	-.02
Neuroticism	0.43 (3, 88)	.74	-.02
General health motivation	0.49 (3, 88)	.69	-.02

Note.

Table 7.6
Distribution of EVT Variables at Pre-Test

	Mean (SD)	Median	Normality[a]
Intention (N = 92)	6.77 (2.67)	8.00	.26**
Attitude video (N = 19)	7.89 (1.66)	9.00	.33**
Information video (N = 21)	5.71 (3.09)	6.00	.24**
Reading (N = 20)	6.60 (2.80)	7.50	.21*
No-treatment (N = 32)	6.91 (2.60)	8.00	.26**
Global attitude(N = 91)	7.88 (4.67)	9.00	.19**
Attitude video (N = 19)	10.05 (3.01)	12.00	.32**
Information video (N = 20)	6.85 (4.96)	8.00	.18
Reading (N = 20)	6.85 (4.87)	6.50	.18
No-treatment (N = 32)	7.88 (4.92)	9.50	.22**
Specific attitude(N = 91)	13.03 (8.34)	14.00	.07
Attitude video (N = 19)	14.00 (7.94)	16.00	.13
Information video (N = 21)	12.76 (7.64)	14.00	.12
Reading (N = 20)	12.80 (9.94)	13.50	.10
No-treatment (N = 31)	12.77 (8.28)	13.00	.09
Perceived benefit (N = 89)	3.93 (0.84)	4.00	.15*
Attitude video (N = 19)	4.19 (0.48)	4.00	.18
Information video (N = 19)	3.84 (0.78)	3.71	.15
Reading (N = 20)	3.54 (0.90)	3.64	.25**
No-treatment (N = 31)	4.09 (0.93)	4.29	.17*

Note. [a] K-S test; * p ≤ .05, ** p ≤ .01.

Table 7.7
Kruskal-Wallis Tests of EVT Variables at Pre-Test

	χ^2	df	Rank
Intention	5.06	3	
Attitude video			56.00
Information video			38.29
Reading			44.48

Table 7.7
Kruskal-Wallis Tests of EVT Variables at Pre-Test

	χ^2	df	Rank
No-treatment			47.48
Global attitude	7.36	3	
Attitude video			58.74
Information video			38.98
Reading			39.65
No-treatment			46.80
Specific attitude	0.40	3	
Attitude video			49.39
Information video			44.86
Reading			45.23
No-treatment			45.18
Perceived benefits	9.07*	3	
Attitude video			51.76
Information video			40.74
Reading			32.05
No-treatment			51.82

Note. * p ≤ .05.

Table 7.8
Kolmogorov-Smirnov Post Hoc Tests for Perceived Benefits

	z	sig.	effect sizes (r)
Attitude video vs information video	0.97	.22	.16
Attitude video vs reading	1.23	.03	.20
Attitude video vs no-treatment	0.89	.25	.13
Information video vs reading	0.67	.52	.11
Information video vs no-treatment	0.92	.20	.13
Reading vs no-treatment	1.34	.03	.19

Note. p ≤ .01.

Table 7.9
Distribution of Pre-Test Barriers Scores

	Mean (SD)	Median	Normality[a]
Perceived barriers (N = 50)	3.68 (1.19)	3.96	.09
Attitude video (N = 8)	3.64 (1.08)	3.71	.24
Information video(N = 14)	3.61 (1.07)	4.00	.17
Reading (N = 10)	3.70 (1.56)	3.75	.22
No-treatment (N = 18)	3.94 (1.10)	3.96	.12
Perceived barriers (N = 88)	3.62 (1.24)	3.92	.11*
Attitude video (N = 19)	3.40 (1.15)	3.33	.17
Information video (N = 20)	3.65 (0.99)	3.96	.16
Reading (N = 19)	3.22 (1.56)	2.42	.22*
No-treatment (N = 30)	3.98 (1.16)	4.11	.12

Note. [a] K-S test; * p ≤ .05.

Immediate Change

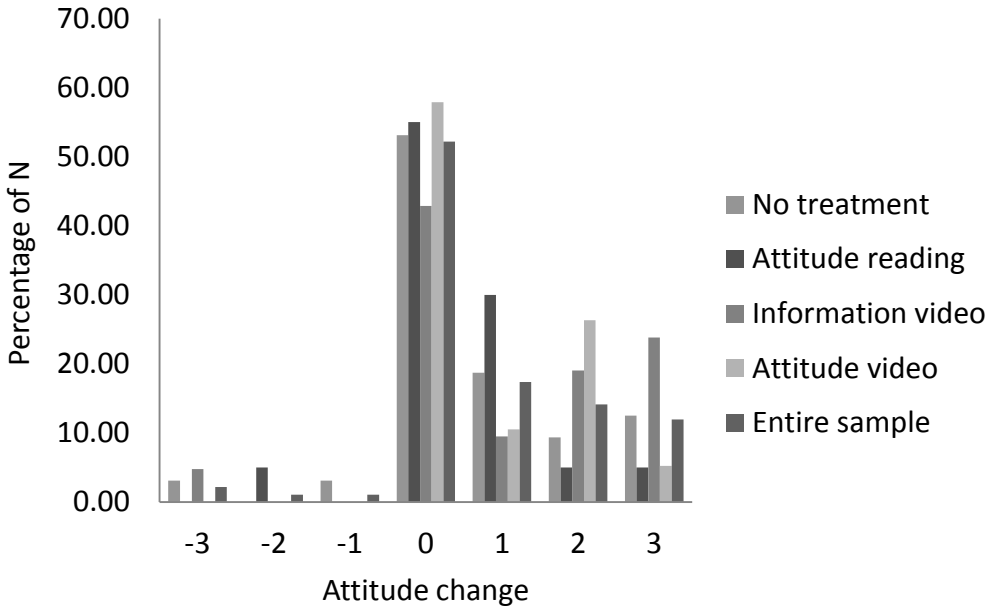

Figure 7.4. Distribution of attitude change scores.
* Has this experienced changed your attitude toward the Pap test? (-3: yes, a lot more negative, 3: yes, a lot more positive)

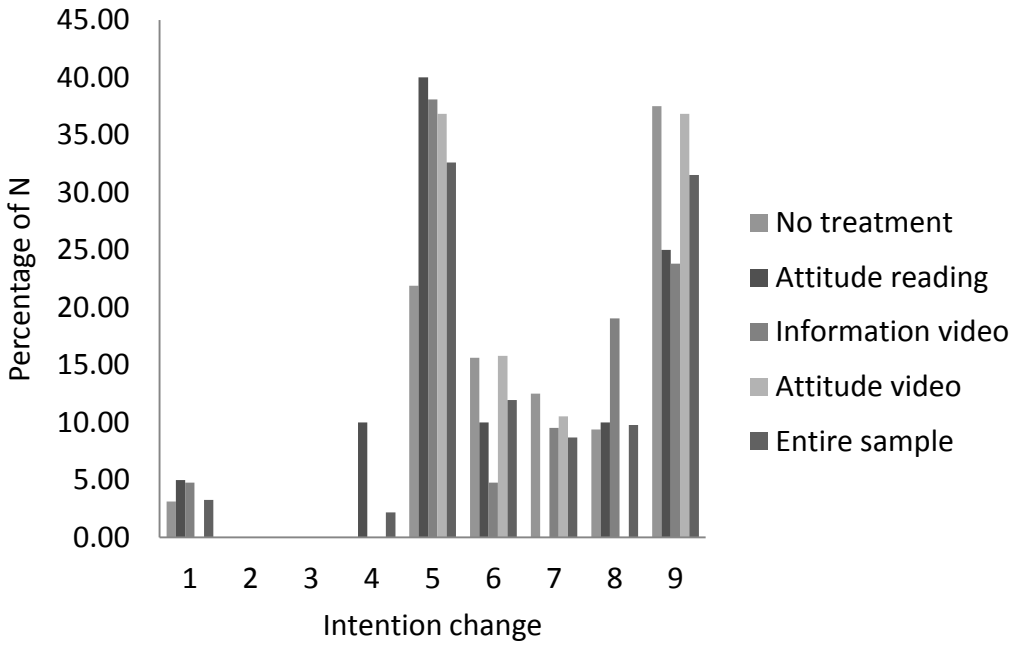

Figure 7.5. Distribution of intention change scores.
* Has this experienced changed your intention to attend for a Pap test when you are 25? (1: yes, a lot less likely, 9: yes, a lot more likely)

Follow-up

Table 7.11
Distribution of Post-Test Variables

	Mean (SD)	Median	Normality[a]
Intention (N = 22)	8.05 (1.86)	9.00	.32**
Treatment (N = 17)	7.94 (2.01)	9.00	.31**
Attitude video (N = 3)	9.00 (0.00)	9.00	n/a[d]
Information video(N = 5)	8.80 (0.45)	9.00	.47**
Reading (N = 9)	7.22 (2.64)	8.00	.28*
No-treatment (N = 5)	8.20 (1.10)	9.00	.37*
Global attitude (N =21)	8.10 (5.01)	10.00	.21*
Treatment (N = 16)	8.24 (5.40)	10.00	.25**
Attitude video (N = 2)	11.50 (0.71)	11.50	.26**
Information video(N = 5)	11.20 (1.30)	12.00	.33
Reading (N = 9)	5.89 (6.57)	8.00	.28*
No-treatment (N = 5)	7.60 (2.89)	7.00	.20
Specific attitude (N =22)	15.64 (9.20)	13.00	.21*
Treatment (N = 17)	15.83 (9.81)	13.00	.17
Attitude video (N = 3)	15.33 (6.66)	12.00	.36**
Information video(N = 5)	16.80 (6.02)	17.00	.16
Reading (N = 9)	15.44 (12.82)	13.00	.19
No-treatment (N = 5)	13.20 (6.83)	12.00	.31
Perceived benefits (N = 22)	4.09 (0.86)	4.00	.15
Treatment (N =17)	4.00 (0.94)	4.00	.15
Attitude video (N = 3)	4.43 (0.42)	4.86	.39**
Information video(N = 5)	4.57 (0.59)	5.00	.37*
Reading (N = 9)	3.57 (1.00)	3.86	.28*
No-treatment (N = 5)	4.34 (0.46)	4.29	.17
Perceived barriers[b] (N = 14)	3.10 (1.30)	3.14	.14
Treatment (N = 10)	3.00 (1.23)	3.36	.17
Attitude video (N = 1)	n/a[d]	n/a[d]	n/a[d]
Information video(N = 4)	3.11 (1.05)	3.14	.17*
Reading (N = 5)	2.76 (1.65)	2.50	.18*
No-treatment (N = 4)	3.36 (1.48)	3.32	.19*
Perceived barriers[c] (N = 22)	3.25 (1.33)	3.57	.11
Treatment (N = 17)	3.22 (1.29)	3.46	.13
Attitude video (N = 3)	3.51 (0.83)	3.79	.30*
Information video(N = 5)	3.15 (0.92)	3.33	.18
Reading (N = 9)	3.16 (1.71)	3.57	.17
No-treatment (N = 5)	3.37 (1.28)	3.42	.12

Note. [a] K-S test; [b] untreated; [c] treated; [d] value could not be computed, because scores in this group are constant or N = 1; * p ≤ .05, ** p ≤ .01.

Table 7.12

Kruskal-Wallis Tests of Pre-Test Differences in the Follow-Up Sample

	Mean (SD)	χ^2	df	Mean rank
Age	23.87 (0.46)	3.25	3	
Attitude video (N = 2)				12.17
Information video (N = 5)				10.70
Reading (N = 9)				8.50
No-treatment (N = 4)				13.39
Openness	8.09 (1.54)	0.97	3	
Attitude video (N = 2)				13.50
Information video (N = 5)				13.00
Reading (N = 9)				10.90
No-treatment (N = 4)				10.33
Conscientiousness	7.32 (1.78)	1.40	3	
Attitude video (N = 2)				14.17
Information video (N = 5)				10.80
Reading (N = 9)				13.20
No-treatment (N = 4)				10.06
Extraversion	5.27 (2.10)	1.60	3	
Attitude video (N = 2)				14.17
Information video (N = 5)				10.00
Reading (N = 9)				9.40
No-treatment (N = 4)				12.61
Agreeableness	7.32 (1.59)	0.57	3	
Attitude video (N = 2)				12.67
Information video (N = 5)				9.90
Reading (N = 9)				12.60
No-treatment (N = 4)				11.39
Neuroticism	7.00 (2.25)	0.97	3	
Attitude video (N = 3)				12.33
Information video (N = 5)				9.70
Reading (N = 9)				13.50
No-treatment (N = 5)				11.11
General health motivation	11.14 (1.70)	3.70	3	
Attitude video (N = 3)				9.50
Information video (N = 5)				16.10
Reading (N = 9)				9.20
No-treatment (N = 5)				10.89
Intention	7.68 (1.84)	6.29	3	
Attitude video (N = 3)				16.50
Information video (N = 5)				14.10
Reading (N = 9)				12.20
No-treatment (N = 5)				8.00
Global attitude	8.14 (4.49)	6.15	3	
Attitude video (N = 3)				16.67
Information video (N = 5)				14.90
Reading (N = 9)				11.20

Table 7.12
Kruskal-Wallis Tests of Pre-Test Differences in the Follow-Up Sample

	Mean (SD)	χ^2	df	Mean rank
No-treatment (N = 5)				8.06
Specific attitude	14.32 (8.67)	0.39	3	
Attitude video (N = 3)				11.50
Information video (N = 5)				13.00
Reading (N = 9)				10.60
No-treatment (N = 5)				11.17
Perceived benefit	4.01 (0.85)	7.85*	3	
Attitude video (N = 3)				13.83
Information video (N = 5)				14.90
Reading (N = 9)				15.00
No-treatment (N = 5)				6.89
Perceived barriers	3.48 (1.37)	0.54	3	
Attitude video (N = 3)				13.67
Information video (N = 5)				10.60
Reading (N = 9)				10.60
No-treatment (N = 5)				11.78

Note. * $p \leq .05$.

Table 7.13
Kolmogorov-Smirnov Z-Tests of Pre-Test Differences in the Follow-Up Sample: Treatment vs No-Treatment

	z	p	N	Effect sizes (r)
Age	0.69	.27	22	.15
Openness	0.67	.32	22	.14
Conscientiousness	0.53	.63	22	.11
Extraversion	0.67	.52	22	.14
Agreeableness	0.79	.26	22	.17
Neuroticism	0.44	.75	22	.09
General health motivation	0.46	.73	22	.10
Intention	0.35	.95	22	.07
Global attitude	0.44	.84	22	.09
Specific attitude	0.44	.95	22	.09
Perceived benefit	0.93	.24	22	.20
Perceived barriers	0.67	.66	22	.14

Note.

Table 7.14
Kolmogorov-Smirnov Post Hoc Tests of Perceived Benefits in the Experimental Groups

	z	p	N	effect sizes (r)
Attitude video vs information video	0.27	1.00	8	.10
Attitude video vs reading	1.00	0.21	12	.29
Attitude video vs no-treatment	0.55	0.79	8	.19
Information video vs reading	1.43	0.01	14	.38

Table 7.14

Kolmogorov-Smirnov Post Hoc Tests of Perceived Benefits in the Experimental Groups

	z	p	N	effect sizes (r)
Information video vs no-treatment	0.63	0.71	10	.20
Reading vs no-treatment	1.20	0.07	14	.32

Note.

Table 7.15

2x2 Mixed Analyses of Variance in Pre-Post Differences Between Treatment and No-Treatment

	F (df_M, df_R)	p	η^2	1-β
Intention (N =22)				
Condition	0.12 (1, 20)	.73	.01	.06
Pre-vs-post	0.62 (1, 20)	.44	.03	.12
Condition*Pre-vs-post	0.07 (1, 20)	.79	.00	.06
Global attitude (N = 21)				
Condition	0.00 (1, 19)	.99	.00	.05
Pre-vs-post	0.07 (1, 19)	.79	.00	.06
Condition*Pre-vs-post	0.84 (1, 19)	.37	.04	.14
Specific attitude (N = 22)				
Condition	0.19 (1, 20)	.67	.01	.07
Pre-vs-post	0.18 (1, 20)	.67	.01	.07
Condition*Pre-vs-post	0.69 (1,20)	.42	.03	.12
Perceived benefits (N = 22)				
Condition	1.05 (1, 20)	.32	.05	.16
Pre-vs-post	0.09 (1, 20)	.77	.00	.06
Condition*Pre-vs-post	1.80 (1, 20)	.20	.08	.25
Perceived barriers (N = 22)				
Condition	0.01 (1, 20)	.94	.00	.05
Pre-vs-post	0.22 (1, 20)	.64	.01	.07
Condition*Pre-vs-post	0.68 (1, 20)	.42	.03	.12

Note. Equality of variances can be assumed for every test.

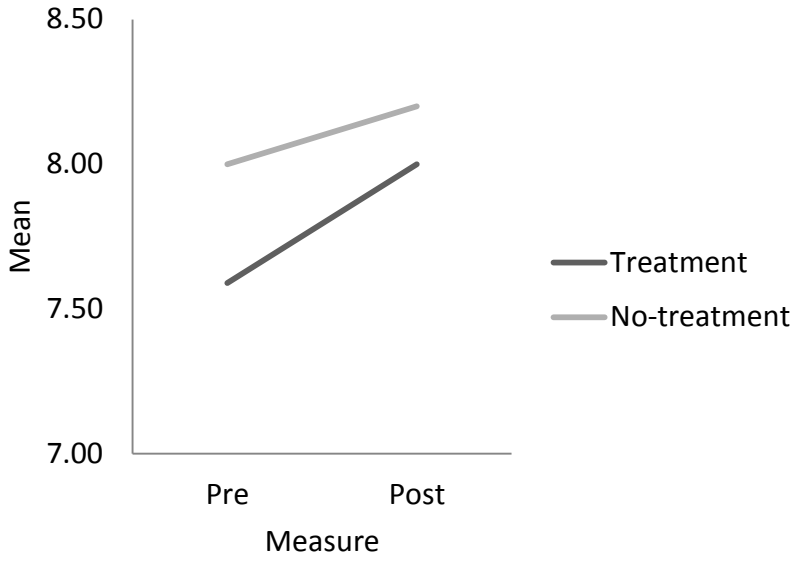

Figure 7.6. Estimated marginal means of intention

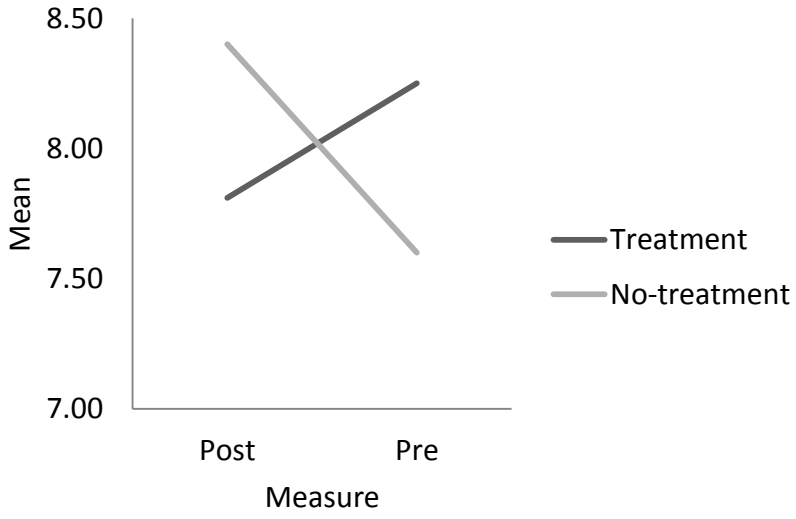

Figure 7.7. Estimated marginal means of global attitude

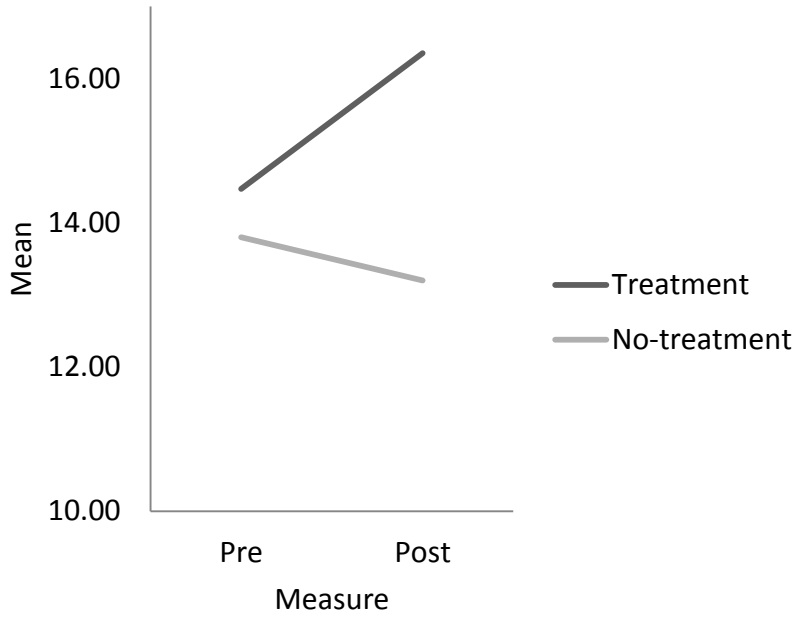

Figure 7.8. Estimated marginal means of specific attitude.