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Understanding screening behaviour for dementia

By

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Abstract

The literature review initially outlines the clinical importance of understanding determinants of screening behaviour. Theories offering accounts for understanding screening behaviour, with special reference to the case of dementia screening, and their evidence is discussed. Dementia screening behaviour is likely to be influenced by: social cognitions; affect; neuropsychological variables; the degenerative nature of the disease; and, by the impact of information imparted to gain informed consent. The review concludes that there are important gaps in our knowledge about dementia screening behaviour. Given that neuropsychologists have expressed concern about the impact of clinical information on attending for a cognitive assessment, exploring its impact is an important area for future research.

Using an asymptomatic older adult population, part one of the empirical study explored the influence of information about the possible outcomes of attending a cognitive assessment, and the temporal order of the information, on screening intentions. Part two assessed the utility of the Health Belief and Monitor Process models to predict intentions. Most participants reported positive screening intentions both before and after reading the information. However, information significantly increased intentions. Reading positive then negative information about possible outcomes was associated with significantly stronger intentions to attend compared to reading negative information first. Monitor style was associated with the influence of information on formulating intentions. Regression analyses revealed that perceived barriers, higher benefits than barriers and cues to action predicted of intentions. However, when belief, influence and satisfaction with the experimental information were entered, only cues to action continued to be a significant predictor of intentions.

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Title: Theoretical approaches for understanding assessment behaviours by older adults, with specific reference to the case of dementia: Empirical evidence and future directions.

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Theoretical approaches for understanding assessment behaviours by older adults, with specific reference to the case of dementia: Empirical evidence and future directions.

Abstract

Dementia affects between 3 and 11% of individuals over the age of 65 (Boustani et al., 2005). Although there is no cure, early diagnosis is important for maximising treatment effects. However, many older adults are reluctant to attend an assessment for dementia and there is growing interest in identifying determinants of dementia screening behaviour to inform interventions to promote attendance. There is a paucity of studies examining dementia screening behaviour and understanding this phenomenon requires synthesising literatures from health, social, developmental, economic and neuropsychology. The review offers a précis of the literatures from social cognition models that have been applied to account for dementia screening intentions, and indirect evidence of the influence of neuropsychological variables on health behaviour is offered. The influence of health information on screening behaviour is then discussed.

Although evidence suggests social cognition models have some utility with this population, they offer a limited account. Conceptual issues of using these models with individuals refereed for an assessment of dementia are considered. Deficits in memory, language and executive functions and information imparted to clients to gain informed consent to health screens could also influence dementia screening behaviour. However, no published studies examining their influence for dementia screening were identified. There are significant gaps in our knowledge of dementia screening behaviour. Research could adopt a radical agenda of rejecting existing models and focus on theory generation, alternatively, a pragmatic approach using theoretically integrated designs to adapt existing health behaviour models could be initially explored.

Health behaviours are activities undertaken by individuals in an attempt to protect and promote wellbeing (Connor & Norman, 1996). They can be repetitive, such as compliance with medication regimes, or non-repetitive such as participating in health assessments and screens. Interest in why some people engage in adaptive behaviour and others do not has led to attempts to elucidate determinants of health behaviour. Psychological models of health behaviour seek to identify and measure psychological determinants to facilitate developing interventions to promote adaptive health behaviour and to gain an understanding of these influences (Armitage & Connor, 2000). Most research in this area has focused on examining health behaviours in working age adults, although there is growing interest in the screening and repetitive health behaviours of older adults. While a considerable body of studies has attempted to account for screening behaviour by older adults for non-neurological conditions such as cancer, less is known about factors influencing screening behaviour for neurodegenerative conditions such as dementia.

This review will outline why it is important for clinicians to gain an understanding of screening behaviour in individuals referred for dementia assessments before offering a précis of the health screening behaviour literature, focusing on dementia screening. It concludes with a summary of current knowledge and suggests directions for future research.

The clinical importance of understanding health screening behaviours

Interest in understanding older adults' health assessment behaviours, particularly in those referred for an assessment for dementia, has risen for three reasons. Firstly, advances in the detection and management of life-altering illnesses, such as dementia (see e.g. Barker et al., 2005), have increased the importance of a prompt diagnosis of the disorder. However, some older adults with memory difficulties are reluctant to be investigated. Studies assessing positive intentions to attend for cognitive assessment, suggest 26% (Commassaris et al., 1993) to 60% (Boustani, Watson, Fultz, Perkins, & Druckenbrod, 2003) of older adults concerned with their memory would attend, to 94% in asymptomatic older adults participating in initial cognitive screening (Boustani et al., 2005). Although in this last study, only 45% attended a full cognitive assessment when recommended. Furthermore, there is often a considerable delay between symptom onset and assessment (Knopman , Donohue, & Gutterman, 2000; Streams, Wackermarth, & Maxwell, 2003). While findings suggest many older adults do not wish to attend for dementia assessment they reflect similar adherence rates for oncology screening by older adults (e.g. Hay et al., 2003).

Secondly, government health policies have challenged the traditional, paternalistic patient-doctor relationship and clients are increasingly being invited to participate in decisions regarding their health (Pinquart & Durbenstein, 2004). This policy change has implications for screening. For example, the National Service Framework for Older Adults (NSF; Department of Health, 2001) stresses promoting client autonomy through imparting information to gain informed consent for all healthcare activities, including screening procedures. Standard 2 requires that information about procedures, their alternatives, associated risks and possible outcomes should be shared with clients to support their consideration of the level of risk they are prepared to take when participating in healthcare activities. Professional Practice guidelines (British Psychological Society, 1995) also state that information pertaining to informed consent should be provided to clients, even when the client's ability to comprehend is in doubt. Thus, clients are being exposed to complex health information to support health choices, including for attending assessments to test their very capacity to make such decisions (Fisher, Johnson-Greene, & Barth, 2002).

Thirdly, promoting older adults as informed decision-makers is seen as important by clinicians as this population is often faced with high risk healthcare procedures that offer limited clinical benefits (Lloyd, 2001), and are often assumed to lack the capacity to make healthcare decisions (Oppenheimer, 2000). However, some clinicians, including neuropsychologists, are concerned about the impact of enhanced information sharing on screening behaviour (Binder & Thompson, 1995). Specifically, they question whether enhanced information sharing might increase client anxiety and lower adherence rates for cognitive assessments (Binder & Thompson, 1995). Clients might be less willing to attend if they were aware of the legal status and limits of confidentiality of findings, and less willing to disclose cognitive, psychosocial, and premorbid histories (Johnson-Greene, Adams, Hardy-Morais, Hardy, & Bergloff, 1997). Indeed, clinicians do not routinely share information with clients about the possible risks associated with healthcare procedures due to fear of negative impact (e.g. Chaplin & Potter, 1996; Croarkin, Berg, & Spira, 2003). In a national survey of informed consent practices for cognitive assessment by psychologists working with older adults, less than half reported discussing with clients the possible risks of attending, the testing process and alternative assessment options, before, during or after a cognitive assessment (Morris & Bucks, 2004). Evidence to be discussed in this review also suggests imparting information about healthcare procedures could be associated with poorer intentions and screening behaviour in non-neurological scenarios.

In sum, to increase prompt attendance to dementia screening and maximise treatment effectiveness, clinicians need to identify determinants of screening behaviour.

In addition, political and professional changes making information sharing an imperative and stress the importance of ascertaining the impact of screening information on dementia screening behaviour. By increasing understanding, clinicians will be better placed to develop interventions to increase acceptance of dementia assessments and maximise treatment benefits. Theoretically driven research may offer answers.

Although there is variation in the use of theoretically driven designs in screening behaviour studies for non-neurodegenerative conditions, the main premise of this review is that theoretically driven research is better placed to advance our understanding of, and to design interventions promoting dementia screening behaviour (Curry & Emmons, 1994). Theoretically driven research has a number of advantages. It informs how research questions are defined, and specifies variables to be tested and manipulated to promote change, e.g. screening behaviour (Curry & Emmons, 1994). It also allows for consistency in variable definition, choice of data analysis strategies and facilitates comparing and interpreting findings. Hence, the present review focuses on reviewing theoretically driven approaches to understanding this phenomenon. A literature search was initially undertaken to identify models and screening studies with older adult participants.

Search strategy and selection criteria

A search of Psychinfo, Medline and Web of Science databases from 1986 to March 2005 was conducted. Search terms were older adult, elderly, ag(e)ing, health, behavio(u)r, intentions, information, education, risk, adverse, screening, assessment, decision-making, models, influenc* and factors. Manual searches were also conducted in; The International Journal of Geriatric Psychiatry, The Gerontologist, Patient Education & Counselling, The British Journal of Health Psychology, and Psychology and Health from 2000. Studies were included if they were; written in English; conducted in clinical settings (real or hypothetical scenarios); with older adults (*M* > 50 years); and, examined screening behaviour. Non-health studies were excluded as their findings are often not replicated in health scenarios (Edwards, Elwyn, Covey, Mathews, & Pill, 2001). Where appropriate, studies outside the inclusion criteria are referred to for critiquing the literature.

The literature search revealed a paucity of studies examining screening behaviour for dementia, for genetic or symptomatic cognitive testing. The review, therefore, examines direct evidence from dementia screening studies, and indirect evidence from studies of screening for non-neurological conditions by older adults, for example oncology. Although the review is primarily concerned with attending for symptomatic dementia testing, dementia genetic testing studies will be reviewed; however, the author acknowledges the differences in the testing scenarios. Indirect evidence is offered where there are gaps in our knowledge about dementia screening behaviour, for comparison purposes with the dementia literature or to elucidate future research agendas.

Overview of models of health screening behaviour by older adult clients

Understanding dementia assessment behaviour requires synthesising disparate literatures from health psychology, e.g. social-cognition models, and from economic, belief updating, coping style, neuropsychological and developmental psychology. This review begins with an appraisal of evidence from social cognition models (SCMs) that have been applied to dementia screening behaviour. This will be followed by a critique of SCMs focusing on the utility of SCMs to account for dementia screening behaviour, including examining evidence outlining the potential impact of neuropsychological variables on dementia screening behaviour. The review will then address models that have been applied to understanding the impact of health information on screening behaviour. Throughout, key features of a model will be summarised before evaluating its evidence and discussing any special considerations in relation to dementia screening.

Social-cognition models

Social-cognition models, derived from social-cognition theory, attempt to explain the proximal determinants of health behaviour and are the dominant account of health behaviours (Armitage & Conner, 2000; Ogden, 2003). The main models are: The Health Belief Model (Rosenstock, 1974); Theory of Planned Behaviour (Ajzen, 1991); Theory of Reasoned Action (Ajzen & Fishbein, 1977); Protection Motivation Theory (Rogers, 1983); Locus of Control (Wallston & Wallston, 1981); Transtheoretical model (Prochaska & DiClemente, 1984); and the Health Action Process Approach (Schwarzer & Fuchs, 1996). Each model offers an account of social-cognitive variables hypothesised to influence an individual's health related behaviours. Given the breadth of factors that are likely to influence attending for dementia screening, this section of the review will review models that have been empirically tested with dementia screening, namely, the Health Belief Model, The Theory of Planned behaviour and, briefly, the Locus of Control model.[2] Before outlining these models, common methodological concerns about dementia screening studies will be summarised for the reader to consider when reviewing the literature.

Dementia studies using SCM frameworks have generally tested only a selection of a model's variables, creating difficulties in ascertaining the utility of these models.

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[2] The methodology of reviewing a limited number of social cognition models in order to explore non social cognition models has previously been used in published reviews of screening behaviour (e.g. Curry & Emmons, 1994). Tables 1 and 2, in Appendices 2 and 3 summarise the main social cognition models. The reader will note there is considerable overlap in variables posited to influence health behaviours.

Unfortunately, prospective designs examining screening behaviour in clinical samples have not, thus far, been conducted in dementia. Hence, studies have relied on hypothetical vignette designs using screening intentions as an outcome measure. Although it has been questioned whether vignette methodologies access the cognitions and affect generated in actual screening, there are advantages to using this methodology in novel areas (Broadstock & Mitchie, 2000), such as dementia screening. Vignettes allow for the isolation and manipulation of variables which would be difficult in clinical settings (Lui & Park, 2004). They also make it easier to meet power requirements as asymptomatic participants can be recruited. There are ethical advantages as the impact of the research process in novel areas can be unclear and some question whether completing a SCM questionnaire creates, rather than accesses, cognitions in novel situations, which could impact on healthcare choices (Ogden, 2003). However, this methodology assumes participant responses are based on information in the vignettes and not other factors. This assumption has not, thus far, been tested. In addition, using intentions as a dependent variable may significantly inflate the amount of variance in findings explained and exaggerate the utility of models as intentions do not necessarily translate into behaviours (Drossaert, Boer, & Seydel, 2003; Gollwitzer, 1993).

The Health Belief Model (HBM)

The HBM (Rosenstock, 1974) is one of the most widely applied SCMs used to account for repetitive and non-repetitive health behaviours (Strecher & Rosenstock, 1997). The model has undergone several revisions and additional variables have been proposed, namely self efficacy (Becker & Rosenstock, 1984) and cues to action (Sheeran & Abraham, 1996). Figure 1 illustrates a version widely used in screening studies. The HBM posits that when individuals are confronted with a threat to their health, health behaviours are the result of a cost/benefit analysis. That is, people engage in a process where the perceived severity of the threat and the perceived efficacy of the behaviours to counteract it, determine the likelihood of carrying out health-promoting related behaviours (Sheeran & Abraham, 1996). The HBM suggests a client would be more likely to attend a dementia screen if s/he feels they are susceptible to dementia, and if s/he perceives that developing dementia would be serious (severity). Additionally, if s/he perceives the benefits of attending the assessment outweigh the costs (barriers), is concerned about his/her health, and is exposed to prompts to attend the screening (cues to action), the client will attend (Umeh & Rogan-Gibson, 2001).

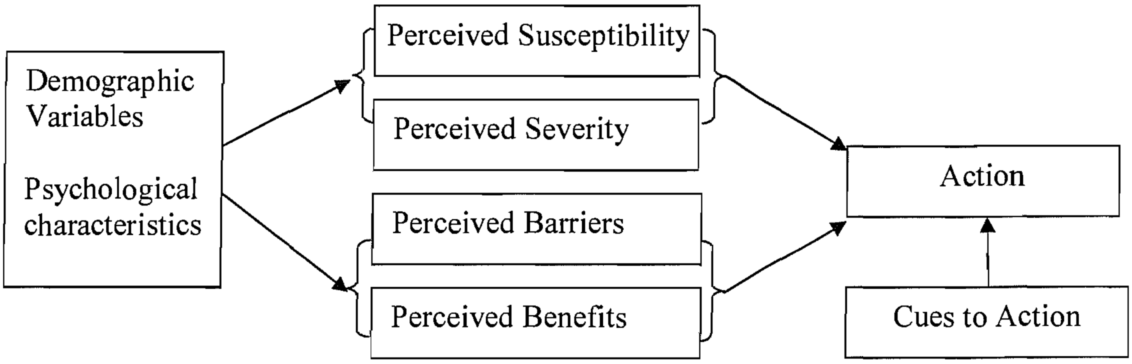

Figure 1: The Health Belief Model (Adapted from Sheeran & Abraham, 1996)

While the HBM has questionable success in explaining repetitive health behaviours, it has some utility in accounting for screening behaviour (Armitage & Connor, 2000). Prospective, cross-sectional and hypothetical vignette studies suggest the HBM can predict screening behaviour of older adults for oncology screens (e.g. Hay et al., 2003; Pakentham, Pruss, & Clutton, 2000, Wardle et al., 2000) and only a few studies have reported no associations (e.g. Borrayo, Guarnaccia, & Mahoney, 2001).

Researchers have also begun to explore its utility to predict intentions to attend genetic and cognitive assessments for dementia.

HBM and intentions to attend an assessment for dementia. Previous reviews of the HBM have examined the utility of HBM variables individually (e.g. Curry & Emmons, 1994), and this methodology will be used here.

Studies exploring intentions to attend a genetic test for dementia support the HBM's core assumption that screening behaviour is influenced by a cost/benefit appraisal of engaging in health behaviours. A study testing only the benefits and barriers variables (Binetti et al., 2005), and a multi-model study testing four of the five HBM variables (not cues to action, Roberts, 2000), report that higher perceived benefits than barriers (benefit subtracted from barrier scores) was the strongest predictor of screening intentions of middle-aged and older adults.

In a study of intentions to attend a cognitive assessment, participants with a family history of dementia endorsed the benefits of attending as outweighing the barriers (Weiner & Heinik, 2004). However, this relationship was not statistically tested with intentions and cognitive dementia screening studies have focused on testing HBM variables as independent predictors of intentions.

Qualitative (Werner, 2004) and quantitative studies (Werner, 2003; Werner & Heinik, 2004) report that perceived barriers (e.g. fatalistic beliefs about treatment / testing, and worry about findings) is an independent predictor of intentions to attend an assessment for dementia. These findings are consistent with the oncology literature, which suggests that perceived barriers is often the strongest or the only significant predictor of intentions and screening behaviour (e.g. Hoogewerf, Hislop, Morrison, Burns, & Sizto, 1990; Lewis & Jenson, 1996, Hay et al., 2003). Oncology studies also suggest that differentiating between types of barriers, e.g. emotional and cognitive, could be explored in dementia studies to help identify intervention priorities as emotional barriers receive stronger endorsements, compared to cognitive, from participants who decline oncology screening (Lagerlund, Sparen, Thurfjell, Ekbom, & Lambe, 2000; Murray & McMillan, 1993).

Studies of intentions for cognitive dementia assessments also report that perceived benefits are associated with intentions at the univariate level; however, regression analyses do not support their role as independent predictors of intentions in middle-aged and older adults with or without family histories of dementia (Werner, 2003, Werner & Heinik, 2004). The lack of support for the benefits variable is in contrast with many oncology screening studies (e.g. Black, Stein, & Loveland-Cherry, 2001; Finney & Iannotti, 2001; McGarvey et al., 2003; Myers et al., 1991; Hay et al., 2003, Thomas, Fox, Leake, & Roetzheim, 1996; but see Curry & Emmons, 1994). Several factors could account for this. Firstly, findings may simply reflect shortcomings in the HBM questionnaire used in dementia studies or a lack of knowledge by older adults of the benefits of attending a dementia assessment, for example advancements in treatments (Roberts & Connell, 2000; Werner, 2004).

It could also suggest that advancements in the treatment of dementia are not perceived as a benefit of attending. Indeed, Werner (2003) suggests the benefits in dementia could be more subtle than in oncology, where benefits include early detection of symptoms to increase survival rates. Conversely, perceived benefits in dementia studies include: planning for the future, preparing family and putting affairs in order (Werner, 2004; Roberts et al., 2003). This has implications for interventions promoting attendance, as it suggests that perceived benefits might not be a determining factor, which could generate difficulties for using positive reasons to promote attendance for a dementia screen.

The single dementia study that tested perceived cues to action (Werner, 2003) reported that cues from powerful others, e.g. family, was a significant predictor of screening intentions. This is consistent with oncology research suggesting family or physician support can independently predict attendance (e.g. Aiken et al., 1994, Champion & Miller, 1996; Janz, Wren, Schottenfeld, & Guire 2003, Lagerlund et al., 2000), and that lay person and professional recommendations are key triggers for attending dementia screens (Streams et al., 2003). Thus, interventions to promote attendance to dementia screening might usefully explore including a systemic component.

Perceived susceptibility to dementia is an equivocal predictor of screening intentions. Susceptibility independently predicts intentions for genetic (Roberts, 2000) but not cognitive screening (Werner, 2003). Both studies used similar definitions of the variable, and thus, findings could reflect differences in the testing scenarios, i.e. future vs. present onset. Werner's (2003) findings are, however, consistent with evidence suggesting older adults avoid thinking and planning for the possibility of developing dementia (Corner & Bond, 2004), that individuals are overly optimistic about the relative and absolute chances of not developing serious illnesses (Clarke, Lovegrove, Williams, & Machperson, 2000; Gerend, Aikin, West, & Erchull, 2004) and with the broader HBM literature that has provided limited support for the variable (Ogden, 2003).

The perceived severity of dementia does not appear to be associated with, or predict intentions to attend, genetic (Roberts, 2000) or cognitive assessments (Werner, 2003) for dementia. Again, these findings reflect the oncology literature (Curry &

Emmons, 1994). Although the severity variable has intuitive appeal, the lack of association could be accounted for by findings suggesting that whilst the fear of developing a serious illness can lead to revisions of attitudes, this may or may not result in changes in intentions or in initiating health promoting behaviours (Naidoo & Liss, 2000). Conversely, Weinstein (2000) suggests that measurement errors in correlation analyses could underestimate the relationship, particularly as studies rarely generate findings where perceived severity is zero, which is more likely to find an association with not engaging in a behaviour. Studies also use between and not within analyses which fail to ascertain how severity impacts on an individual's behaviour.

The regression analyses used to test the variable could, also in part, account for findings. Most published HBM research uses regression analysis where all HBM variables are treated as independent predictors and entered into multiple regression models that throw out "the strongest swimmers" (Strecher & Rosenstock, 1997 p. 116). This approach may not be a valid test of the HBM, as it ignores possible inter-relationships among variables (Strecher & Rosenstock, 1997). These criticisms highlight an important difficulty with testing the HBM, as it was formulated without detailing how the different variables of the model combine. Indeed, there is disagreement whether the variables represent independent predictors, as assumed by most researchers (Rutter & Quine, 2002), or whether it is the relationships between the variables (severity + susceptibility, and benefits - barriers) that determine health behaviours (Armitage & Conner, 2000; Sheeran & Abraham, 1996).

Finally, no published dementia screening studies have tested the self efficacy variable. However, a number of oncology studies suggest it correlates with, and independently predicts, screening behaviour in older adults. For example, Hay et al.

(2003) found that combining self efficacy, cues to action (GP recommendation), benefits and barriers, accounted for 40% of variance in findings. Studies combining self efficacy with the Theory of Planned Behaviour (Ajzen, 1991) also report that self efficacy was the single strongest predictor of screening behaviour (Lechner, de Vries, & Offermans, 1997; Tolma, Reininger, Ureda, & Evans, 2003). Self efficacy could be an interesting addition to future research as older adults fear 'looking stupid' when completing cognitive assessments (Werner, 2004).

In sum, several HBM variables appear to be predictive of intentions to attend genetic and cognitive assessment for dementia. Genetic testing intentions are influenced by higher perceived benefits than barriers, and susceptibility of developing dementia. In cognitive assessment scenarios, screening intentions are influenced by the role of perceived barriers and cues to action. In the single study that tested all of the HBM variables (Werner, 2003), the HBM added significantly to the predictive power (24% of variance) of demographic variables alone (6% of variance). In a study involving partial testing (benefits and barriers variables) of the model (Werner & Heinik, 2004), with first degree relatives of AD sufferers, it accounted for 29%, compared to 20% of variance for demographic variables (lower income, higher subjective concerns about their memory and fewer neuropsychiatric symptoms in the dementia relative). However, given that several variables have received weak and inconsistent support, the HBM alone, arguably, cannot offer a sufficient account of the determinants of dementia screening behaviour and other models need to be explored.

For example, Roberts (2000) combined HBM variables with information coping style (Miller, 1987) and accounted for 50% of variance in findings. Roberts also explored Locus of Control (Wallston & Wallston, 1981), for which he found no support as test intentions were unrelated to external or internal loci of control, and the model suggests that an internal perception of control is associated with adaptive health behaviours (Norman & Bennett, 1996). Although no other published study for dementia screening intentions with participants >50 years has used a SCM framework, a study using the Theory of Planned Behaviour exploring intentions to attend a genetic test for dementia with undergraduate participants suggests it could be a useful direction for future research.

Theory of Planned Behaviour (TPB)

The TPB (Ajzen, 1991) is an expectancy-value model derived from the Theory of Reasoned Action (Ajzen & Fishbein, 1977), see Figure 2. It suggests people engage in deliberate, rational decision making and systematically use information in choosing behaviours (Conner & Sparks, 1996). Health behaviour can be predicted from behaviour intentions and perceived behavioural control (PBC), and behavioural intentions are determined by attitudes, subjective norms and PBC. Behavioural intentions are held as the proximal determinant of volitional behaviour. Namely, the more one is motivated or consciously intends to perform the target behaviour (which is under one's control), the more likely the behaviour is to be performed (Armitage, Norman, & Conner, 2002).

Attitudes are the result of evaluations of the target behaviour and its likely outcome. Subjective norms are determined by 'normative' beliefs (perceptions of the preferences of influential others) multiplied against the individual's motivation to comply with these preferences. Finally, PBC is determined by the evaluation of how difficult/easy it would be to carry out the target behaviour, for example, ability, emotional resources, and money factors; multiplied by opportunities to perform the behaviour (Rutter & Quine, 2002). In the model, PBC can directly predict behaviour and behavioural intentions. The PBC variable takes into account that not all behaviours are under complete, volitional control, and it bears some similarity to the proposed role of self efficacy beliefs (Conner & Sparks, 1996). Ajzen (1991) argues that PBC suggests individuals are more likely to engage in behaviours of which they perceive they have control over. Thus, someone would be more likely to attend for a dementia assessment if s/he has positive attitudes towards attending, is motivated by the positive judgements of attending from significant others, feels the behaviour is within their control / resources, and has a positive intention to attend.

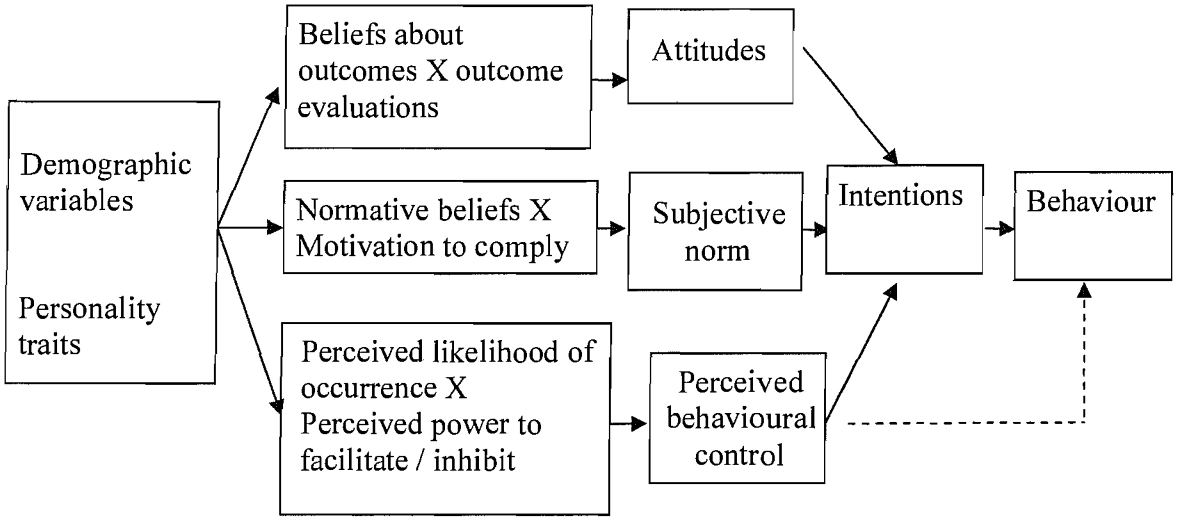

Figure 2: Theory of Planned behaviour (Adapted from Rutter & Quine, 2002)

The TPB has been shown to predict a range of repetitive health behaviours although fewer studies have used it in screening scenarios (Armitage et al., 2002). However, longitudinal, prospective and cross-sectional studies using cognitively intact mixed adult–older adult and older adult participants ($M > 50.0$ years, total $N > 7000$) report support for its structure and variables (Berglund et al., 2005; Drossaert et al., 2003; Rutter, 2000; McCaffery, Wardle, & Waller, 2003; Steadman & Rutter, 2003; Steadman, Rutter, & Field 2002; Tolma et al., 2003). Attitudes, PBC and subjective norms are associated with and predict intentions (Drossaert et al., 2003; McCaffery, et al., 2003; Rutter, 2000; Steadman & Rutter, 2003), although Berglund et al. (2005) found that only attitudes predicted intentions. Correlation and regression analyses from oncology screening studies also show intentions predict screening behaviour for a range of cancers (Drossaert et al., 2003; Lechner et al., 1997; McCaffery et al., 2003; Rutter, 2000; Steadman & Rutter, 2003; Tolma et al., 2003) and accurately discriminate between attenders and non-attenders at first-round screening (Drossaert et al., 2003; Rutter, 2000). Frost, Myers, and Newman (2001) also report some support for the TPB to account for intentions to attend a genetic test for dementia.

The TPB and intentions to attend for a genetic test for dementia. Frost et al. (2001) tested intentions to attend a hypothetical genetic test of dementia that described 50% and 90% lifetime chances of developing the disease. Along with number of persons known with AD, anticipated regret, and likelihood of taking a genetic test for cancer, positive attitudes and subjective norms predicted intentions, accounting for 47% and 17% of variance respectively (total 64%) in the 50% risk scenario. In the 90% risk scenario, only subjective norms predicted screening intentions (31% of variance). PBC did not correlate with or predict intentions in either scenario. Thus, in situations with various degrees of ambiguity about the assessment outcome, different factors may influence behaviour. Although an interesting study, the genetic test scenario described is not clinically available and this could have distorted the utility of the variables. In addition, not all variables were supported and using of intentions as an outcome measure meant that PBC was not fully tested as was not the behavioural intentions variable. However, oncology and Frost et al.'s studies suggest that the TPB could be an interesting model to explore in relation to dementia assessment behaviour, in particular with cognitive assessment behaviour.

Whilst the findings reviewed thus far suggest SCMs offer useful frameworks for elucidating determinants of dementia screening behaviour, there are a number of conceptual issues with applying them to dementia screening.

Critique of SCMs in relation to dementia screening

Theoretical concerns about SCMs in the wider health literature are numerous and emphasis in this review will be given to outlining concerns relating to attending for dementia assessments. Evidence will be presented, which collectively questions if SCMs are conceptually appropriate and whether they offer a comprehensive account of dementia screening behaviour as opposed to intentions[3].

One of the key assumptions of SCMs is that combinations of cognitive and social variables underlie the proximal determinants of behaviour (Rutter & Quine, 2002). However, studies in dementia suggest social-cognition variables alone might not account for dementia screening behaviour. Whilst researchers could explore alternate SCMs, the overlap between SCM variables in different models gives a limited pool of variables from which to draw (Ogden, 2003). Although future research could add variables from other SCMs to research designs, and evidence suggests that this method can increase the amount of variance explained, effect sizes remain small to moderate (e.g. Black et al., 2001; Norman & Connor, 1994). However, researchers argue against simply adding more and more social-cognition variables to studies in an attempt to

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[3] It is beyond the scope of the present review to address the full range of theoretical issues raised. For consideration of their general application to older adults the reader is directed to Hart (1997). For discussions of the broader theoretical issues, interested readers are directed to Ogden (2003; 2004), Armitage & Connor, (2000) and van der Pligt & De Vries, (1998).

improve their predictive power, as this would still not address non-social cognition factors that could influence behaviour (Armitage & Connor, 2000; Ogden, 2004).

SCMs have also been criticised for focusing on the cognitive component of attitudes as predictors of behaviour and for subsuming affect into cognitive representations, e.g. “an assessment would worry me too much”. Attitudes, however, which underpin SCMs, consist of affective, behavioural and cognitive components (Stahlberg & Frey, 1996), and not considering the affective component means that SCMs offer an incomplete account. For example, indirect evidence shows that emotional, compared to cognitive barriers are critical determinants of oncology screening behaviour (Largerlund et al., 2001; Murray & McMillan, 1993). Laboratory evidence also indicates that affect ‘heuristics’ (affective responses to stimuli) are involved in evaluating the relationship between risks and benefits of engaging in a behaviour (Finucane, Alhakam, Slovic, & Johnson, 2000). Anticipatory affect, namely anticipating feeling regret at taking the test, can also predict health behaviours, including for dementia screening (Frost et al., 2001; van der Pligt & De Vries, 1998).

Furthermore, many symptomatic individuals are aware of declining cognitive skills for several years before a diagnosis is sought, triggering anxiety, depression (Sinoff & Werner, 2003) and an ‘existential terror’ (Beard, 2004; Cheston & Bender, 1999). This may be particularly true of individuals diagnosed with mild cognitive impairment, who have to attend for follow-up cognitive assessments and who describe a personal sense of uncertainty, identify confusion, hopelessness and despair, and mistrust of assessment findings (Robinson, Elkman, & Wahlund, 1998). Thus, the emotional sequelae triggered by the suspicion that one has a dementia could influence screening behaviour and future research should include emotional measures to explore their relationship with dementia screening.

The emotional sequelae triggered by the fear one has dementia, a degenerative illness for which there is currently no cure, highlights another potential difficulty of using SCMs, namely, they were developed to account for preventative and adaptive health behaviours. Thus, applying them to account for health behaviours for degenerative, currently incurable, conditions is beyond their original scope (Norman & Conner, 1996). For example, some SCMs are based on costs/benefits analysis, yet if screening does not offer prophylactic or curative treatments for the illness, the determinants of behaviour in non-terminal scenarios may not apply to these illnesses. Hence, future research could explore the influence of the cognitions triggered by the fear of suspecting one has a terminal illness on screening behaviour. Researchers could look to evidence from physical health settings that suggests existential, spirituality and religiosity theoretical frameworks can predict the health behaviours of these populations (see e.g. Chochinov et al., 2005; Crowther et al., 2002; Benjamins & Brown, 2004)[4]. Exploring the roles of personal meaning, moral/religious norms, personal values and death anxiety could add to our understanding of health behaviours above SCM factors as well as add to the pool of cognitions from which researchers might draw.

Given that clients referred for a dementia assessment are likely to present with some degree of cognitive impairment, it is, perhaps, important to consider the role of neuropsychological variables in determining screening behaviour. Unfortunately, no

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[4] Readers interested in the role of these frameworks on health behaviour are referred to Snyder (2003) for religiosity and to Katsumo (2003) for spirituality in living with dementia; to Reker (1997) and Fry (2000; 2001), for a discussions of the importance of personal meaning and adaptation in old age; and to Nygard and Borell (1998) and Albinsson and Strang (2002) for the importance of existential factors in individuals diagnosed with dementia. For empirical evidence on the influence of existential factors in health behaviour in individuals with degenerative and terminal illnesses see also Morita (2004) and Morita, Akechi, Sugawara, Chihara, and Uchitomi (2002).

direct evidence for the influence of cognitive impairments on dementia screening behaviour was identified, although indirect evidence from studies of normal ageing, and using cognitively impaired adults and older adults diagnosed with schizophrenia, suggests neuropsychological variables are powerful determinants of health behaviour.

Neuropsychological determinants of health behaviour

Carrying out health behaviours requires older adults to use cognitive skills including information processing, language comprehension and expression, working, retrospective and prospective memory, and executive functions. Although the relationship between overall cognitive functioning and health behaviour is complex, deficits in specific cognitive domains could mediate the relationship between attitudes, intentions and health behaviour and independently predict health behaviour (e.g. Buchanan, 1992; Jeste et al., 2003).

Evidence suggests that age related cognitive decline in prospective, retrospective and working memory (e.g. Neupert & McDonald-Miszczak, 2004; McDonald-Miszczak, Maris, Fitzgibbon, & Ritchie, 2004; Park & Kidder, 2001), visuospatial skills (Park et al., 2002; Smith et al., 1999) and attention and concentration (Wetherell & Unutzer, 2003) are inversely associated with adherence to recommended treatment behaviours, even when there was a behavioural intention (positive attitude) to do so. Studies with cognitively impaired adults / older adults also suggest that deficits in language skills, such as written and verbal comprehension, are inversely related to health behaviours (Brady-Wagner, 2003; Dunn & Jeste, 2001).

Deficits in executive skills could influence dementia screening behaviour in several ways. Firstly, anosognosia, or lack of awareness of symptomatology, which is often found in dementia and is associated with dysfunction of neural networks involved in memory, learning, and executive functions, can impact negatively on initiating repetitive health behaviours, above other illness and medication factors (e.g. Cuffel, Alford, Fischer, & Owen, 1999; Smith et al., 1999, Todman, Gordon-Leeds, & Taylor, 1997; Nageotte, Sullivan, Duan, & Camp, 1997; Kemp, Hayward, Applewaite, Everitt, & David, 1996; Ziguras, Klimidis, Lambert, & Jackson, 1997). Thus, clients with anosognosia as a part of their dementia could be less likely to engage in dementia screening as screening would be perceived as irrelevant.

Deficits in executive skills (initiation, conceptual thinking, set-shifting, working memory), and evidence of cognitive perseveration, are independent predictors of not initiating and maintaining treatment behaviour, even when controlling for other illness factors, and when there was a positive intention to engage in the behaviour (e.g. Cuffel et al., 1999, Goodman, Knoll, Isakov, & Silver, 2005; Jeste et al., 2003; Mutsatsa et al., 2003; Rosen et al., 2003). Indeed, Rosen et al. (2003), with normally aging adults, reports that the Minnesota Mental State Examination (Folstein, Folstein, & McHugh, 1975), and tests of executive functioning were inversely associated with, and independent predictors of, medication adherence (31% of variance) and significantly adding to the predictive value of demographic variables. This suggests that dissociations between planning (intentions) and behaviour could moderate the predictive role of both attitudes and intentions in SCMs. This could have implications for using SCMs with this population, in particular the TPB, as intentions are held as the proximal determinant of behaviour. Deficits in memory or executive functioning skills could mean that individuals may not act in accordance with their attitudes to attend. Whilst there is already considerable debate in the wider health and social psychology literatures about the assumption (e.g. Calnan & Rutter, 1987), this assumption might not hold with cognitively impaired individuals. Indeed, neuropsychological findings could, in part, account for why SCMs are more successful at predicting intentions rather than actual behaviour by older adults.

A related concern is that SCMs assume that rational decision making underpins health behaviour (Conner & Norman, 1996). Although some SCMs allow for different depths of processing according to motivation and ability (e.g. Petty & Cacioppo, 1986), they all assume that individuals engage in deliberate processing in novel situations, namely considering and weighing up pieces of information, as opposed to automatic cognitive processing, such as heuristics or mental shortcuts such as "do what I usually do" ; "Take Dr. Advice". Whilst this assumption has been questioned in the broader health and decision making literatures (e.g. Broadstock & Michie, 2000; Fazio, 1990, cited in Norman & Conner, 1996; Pearce, 1993) it is especially problematic in relation to older individuals invited to attend dementia assessment.

Rational decision-making requires intact cognitive processes, particularly in comprehension, information processing, attention, abstract thought and recall (Brown & Park, 2003; Hogarth, 2005). Two reviews of the literature on older adult health decision making, report that older adults experiencing age-related cognitive decline were less likely to use rational decision making compared to adult populations (Brown & Park, 2003; Pinquart & Duberstein, 2004). Independent of illness factors, older adults make fewer comparative judgements about healthcare options, consider fewer treatment options, request fewer pieces of information and offer less complete rationales for decisions. Older participants were also more likely to use expert heuristics (e.g. doctor recommendations) than younger participants (Brown & Park, 2003).

Moreover, impaired decision making abilities characterise the moderate and advanced stages of dementia (Kim, Cox, & Caine, 2002)[5]. Whist individuals in early dementia may still perform above the legal standard for capacity in decision making; it seems unlikely that individuals with fewer cognitive resources would use a deliberate rather than an automatic route. Individuals referred for a dementia assessment may rely on more automatic processes such as heuristics, and external cues to compensate for fewer cognitive resources. Thus, if cognitively impaired individuals do not engage in rational decision making, the validity of using SCMs must be questioned.

However, despite these concerns, a review of evidence of health behaviours with schizophrenic populations reports that attitudes are consistent, independent predictors of treatment behaviour (Lactro, Dunn, Dolder, Leckland, & Jeste, 2002). Studies using cognitively impaired adults with schizophrenia also suggest the HBM has utility in accounting for medication adherence behaviours. For example, Adams and Scott (2000) showed that HBM variables combined with fear of hospitalisation accounted for 43% of variance and correctly classified 90% of participants into adherers and non adherers (see also Budd, Hughes, & Smith, 1996). Thus, not using SCMs with cognitively impaired populations could be premature, particularly with individuals with mild cognitive impairments, as it could be that neuropsychological variables are of greater significance as the illness progresses, or in the presence/absence of specific impairments. However, it does suggest that future dementia screening research using symptomatic populations should take into account the potential influence of neuropsychological functioning. A

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[5] Although of interest, it is beyond the scope of the review to explore the related topic of dementia and decision making capacity. The reader is directed to Dunn and Jeste (2001) for a discussion of the problems of definition and measurement of decision making capacity, and to Kim, Karlawish, and Caine (2002), and Cherniack, (2002) for decision making competence and neuropsychological predictors of decision making competence and strategies to improve understanding of information in older adults. Fazel Hope, Phil, and Jacoby (2000) consider the influence of cognitive status and treatment choices.

theoretically integrated approach could be explored. Research could combine neuropsychological variables with SCMs to gain an understanding of their interrelationships. The HBM might be well placed to subsume neuropsychological variables into its structure as there is precedence for sub-dividing barrier items, for example, cognitive and emotional (Largerlund et al., 2001; Murray & McMillan, 1993). Hence, neuropsychological variables could be treated as a series of barrier items. Furthermore, the ability to test variables in the HBM as independent predictors and at an interaction level offers researchers the option of exploring cognitive variables as direct determinants or as mediators.

Recently, Murray et al. (2004) have proposed an, as yet untested, model of repetitive health behaviours in older adults that takes account of developmental and neuropsychological factors. It posits that a combination of predisposing patient characteristics (e.g. attitudes, expectations and disabilities) interact with an individual's enabling resources (e.g. income, key relationships), care needs (e.g. severity outcome), and with healthcare system factors, to determine treatment behaviour and outcome. Although the model is promising, it does not indicate a role for executive functions in health behaviour. This is an important omission given the above evidence.

Furthermore, like SCM studies of screening behaviour, it largely ignored a further important determinant of behaviour. That is the influence of health information shared with clients to gain informed consent to health procedures. This is disappointing as evidence suggests health information can influence screening choices and Davis et al. (2000) argue that the HBM could be a useful framework for understanding the influence of information on health behaviour.

The role of information in health screening behaviour

Imparting information about healthcare activities aims to ‘democratise’ health decision-making and is one of the prerequisites for gaining informed consent for health-care activities (Jepson, Hewison, Thompson, & Weller, 2005; Mayberry & Mayberry, 2003). Although older adults welcome receiving health information to support their decision making (Pinquart & Duberstein, 2004), imparting health information to older and cognitively impaired clients is controversial (Cohen-Mansfield, 2001). Clinicians worry about the negative impact of enhanced information sharing and the ability of older adults to retain, comprehend and communicate choices derived from it (Dunn & Jeste, 2001; Tymchuk & Oulsander, 1990; 1991). In addition, there is disagreement about how the impact of information should be measured, e.g. screening uptake vs. promoting autonomy, vs. recall (Edwards & Elwyn, 1999). This section of the review will offer a précis of the literature examining the impact of health information, taking into account the different ways of measuring its impact and exploring hypotheses for accounting for this impact. Evidence relating to the influence of different ways of expressing information to clients on health behaviour will then be discussed. Lastly, evidence suggesting that dispositional information coping style can also influence the impact of health information and behaviour will be reviewed.

The impact of information on screening behaviours by older adults

Information imparted verbally, written and in video form is associated with increased client participation in decision making, greater satisfaction with the informed consent process, increased perceptions of the severity of a disease, and the accuracy of perceptions of risks and benefits without significantly increasing anxiety, and with reduction in decision conflict (e.g., Davison, Kirk, Degner,& Hassard, 1999; Garrud

Wood, Stainsby, 2001; Gattellari & Ward, 2003; 2005; Hewiston & Austoker, 2005; Partin et al., 2004; Pinquart & Dubersetin, 2004; Schapira & Van Ruiswyk, 2000; Sheridan, Felix, Pignone, & Lewis, 2004; Wolf, Krist, Joghnson, & Stenborg, 2005). Furthermore, these effects last up to 8 weeks post exposure (Barlow & Wright, 1998; Boundouki, Humphries, & Field, 2004). Conversely, information can lower perception of the efficacy of screening procedures and of susceptibility to the illness being tested (Gattellari & Ward, 2003; 2005; Lipkus, Green, & Markus, 2003; Partin et al., 2004; Schwartz, Rimmer, Sands, Daly, & Lerman, 1999; Wolf et al., 2005; Wolf, Nasser, Wolf, & Schorling, 1996; Wolf, Philbrick, & Schorling, 1997). It also does not appear to increase perceptions of self efficacy (Barlow & Wright, 1998).

Interpreting the clinical impact of health information on screening behaviour is complex, not least as intentions, rather than screening behaviour, are used as outcome measures. Studies also fail to take baseline measures of intentions before imparting information and use between subjects designs which preclude ascertaining the impact of information on an individual's decision making. However, many oncology studies report that written and video information is associated with reducing intentions and actual screening behaviour in older adult participants (e.g. Adab et al., 2003; Berglund et al., 2005; Gattellari & Ward, 2003; 2005; Hewitson & Austoker, 2005; Schwartz et al., 1999; Wolf et al., 1997). It is important to note, however, that lower intentions do not necessarily translate into negative intentions. For example, the mean intentions in Berglund et al. (2005) remained in the positive range for the information group, but were comparatively lower than in the control group. In addition, the negative impact of information appears to be mediated by a family history of the disease (Wolf et al., 1997), self-referral for the test (Berglund et al., 2005), and being at higher risk of the disease being screened (Adab et al., 2003). Hence, in scenarios of 'low' as opposed to 'high' personal involvement, information might have a greater negative impact.

By contrast, one study reported a non significant trend for written information to increase intentions (Boundouki et al., 2004). Studies also report information significantly increases screening intentions and behaviour for a range of health screens (e.g. Chua Mok, Kwan, Yeo, & Zee, 2005; Humphries, & Field, 2003; Humphries, Ireland, & Field, 2001; Ore, Hagoel, Lavi & Rennert, 2001). Lipkus, et al. (2003) found that participants receiving information about the severity of colorectal cancers were twice as likely to attend for screening. Tomlinson, Kyrgiou, Paraskevaidis, Kitchener, and Martin-Hirsch (2004) also report that health information (about the illness and procedure), combined with a reminder letter, doubled screening behaviour compared to controls for colposcopy screening. However, in Humphries et al. (2001) only one extra participant from the information group reported positive intentions and, overall, 91% of the information and 92% of the control groups reported neutral or negative intentions to attend, hence, the clinical impact of the information was negligible. In addition, in Chua et al. (2005) the information intervention focused only on the benefits of attending mammography screening. Including risk information about the procedure might have produced different results. Finally, only a few studies have reported that written information has no impact (Milstein &Weinstein, 2002; Michielutte et al., 2005; Sheridan et al., 2004; van Eijken et al., 2004; Zhu et al., 2002).

In sum, it would appear that whilst information improves perceptions of autonomy these changes do not necessarily translate into increased screening uptake, and might even lower intentions and behaviour. Given that imparting information is central to health communication, and appears to be of benefit to clients, researchers have begun to explore factors that could account for the negative impact on intentions and behaviour. Several hypotheses have been offered and this evidence will be reviewed.

Accounting for the negative impact of information on screening behaviour

Several researchers have suggested that older adults may feel overwhelmed by the amount and type of information imparted and by the personal responsibility for involvement in healthcare decision making (Pinquart & Duberstein, 2004; Wolf et al., 2005). Support for this hypothesis comes from indirect evidence suggesting that a number of factors may contribute to older adults being overwhelmed by written information sheets. That is, written patient information materials often require a reading above the average patient (Buck, 1998), poor numeracy and literacy skills can impair understanding of patient information sheets (Parker & Gazmararian, 2003), and visual and auditory deficits (Murray et al., 2004), which are more prevalent in older adult populations (Davis et al., 2001), are also associated with greater difficulty comprehending health information could contribute to clients feeling overwhelmed by information (Davis et al., 2001; Gordon-Lubitz, 2003). Indeed lower literacy skills in adults and older adults are associated with poorer understanding of health information and with screening uptake (Davis et al., 2001).

Cognitive decline associated with normal ageing or disease can impact on older adults' ability to 'use' health information to inform their decision making, which could also contribute to feeling overwhelmed and may account for negative impact on screening intentions. Specifically, changes in information processing speed, working memory, deficits in inhibition and conceptual reasoning (McGuire, Morian, Codding, & Smyer, 2000) have been shown negatively to impact on an older adults' ability to recall and act on health information.

Compared to working aged adults, cognitively intact older adults have difficulty in recalling, recognising and comprehending verbal and written health information about illnesses, even when the illness is familiar (Brown & Park, 2002; Dahlin – Ivansoff, Klepp, & Sjostrand, 1998; Lui & Park, 2004; Park & Kidder, 1996; Shurnas & Coughlin, 2003, Williams, French, & White, 2003). A recent review found that older adults recalled 17 – 60% of information imparted (McGuire et al., 2000). Even a visual aid did not significantly increase information recall in one study (Lloyd, Hayes, Bell, & Naylor, 2001), nor did re-presenting the information as many as three times over a two week period (Pucci, Belardinelli, Borsetti, Rodriguez, & Signorino, 2001; but see Kim, Karlawish, et al., 2002). Pucci et al. (2001) found that mildly cognitively impaired clients and 20% of cognitively intact controls struggled to recall information pertaining to informed consent regarding research, recalling only thematic details. In addition, older adults struggle to comprehend (Fuller, Dudley & Blacktop, 2001; Sekeres et al., 2004) and recall (Lloyd, 2001; Lloyd et al., 2001) risk information expressed as basic probabilities, percentages and fractions. Hence, the failure to comprehend information could contribute to its negative impact.

However, accuracy of recall for probabilistic information is improved by using pictorial representations of percentages compared to fractional probabilities (Fuller Dudley, & Blacktop, 2001). Furthermore, basic strategies such as rehearsal, (Park & Brown, 2002), questioning clients about the information (Rikkert, van den Bercken, ten Have, & Hoefnagels, 1997), presenting information visually and verbally (Dunne & Jeste, 2001), 'try out' and re-presenting information on several occasions, (Gur, Moberg, & Wolpe 2002), combining note taking with slower rate of speech, short sentences, and emphasising key words (McGuire et al., 2000), reducing the reading age (<8th grade), storybooks, and multimedia presentations (Barron, Duffey, Byrd, Campbell, & Ferrucci, 2004) can improve recall and comprehension of verbally presented health information in older adult populations, including individuals diagnosed with mild and moderate dementia (Kim, Karawish, et al., 2002).

Hence, older adults may struggle to process health information, and it is possible that processing this information via a heuristic route could play a role its negative perception. Although, if one considers that information increases satisfaction and is welcomed by clients, this hypothesis needs further investigation. However, Ley (1989) proposes that health information will only increase compliance with recommended behaviours, if a patient can recall, and understand it, and is satisfied with the consultation process. This could account for the discrepancy between increased satisfaction and lower intentions reported by studies.

Imparting particular types of health information can also decrease intentions. Information about illness susceptibility and test efficacy lowers intentions as participants report that as risks of developing the illness are perceived as low, the screen is perceived as irrelevant (e.g. Gattellari & Ward, 2003; 2005). Studies manipulating the magnitude of risk associated with health procedures with older adult cognitively intact (Berry, Michas, & Bersellini, 2002) and cognitively impaired populations (Kim, Cox, et al., 2002; Sachs et al., 1994) also report decreased intentions to participate in research and treatments as the level of risk increased, for example vomiting side effect through to life threatening outcomes associated with treatment. Interestingly, some evidence suggests there are no differences in level of risk and decision making in the early stage of dementia compared to healthy controls (Kim, Cox, et al., 2002) although moderate AD sufferers are comparatively less inclined to participate in high risk research and treatment scenarios (Sacks et al., 1994; Schonwetter, Teasdale, Taffett, Robinson, & Lucki., 2003). According to the Elaboration Likelihood Model (Petty & Cacioppo, 1986) health information could trigger a more thoughtful consideration of the screening behaviour which could result in negative appraisal.

In sum, findings about the impact of information on screening intentions and behaviour offer some support for clinician concerns, but more clinically based research is needed. However, imparting information, particularly about potential risks, is central to gaining informed consent (Fuller et al., 2001). Furthermore, it may be the way the information is presented to a client and a client's dispositional information coping style that influence its impact.

Information presentation manipulations

Reviews and a meta-analysis of studies suggest the way clinical information is presented can influence an older adult's perception, processing, understanding and recall, and health behaviour (Edwards et al., 2001).[6] Two theoretically driven approaches, derived from Prospect theory (Tversky & Kahnman, 1981) and the Belief Adjustment Model (Hogarth & Einhorn, 1992) offer accounts of the impact of information and outline information presentation manipulation methods that are associated with improved adherence to screening procedures. Unfortunately, these theories have not been tested with dementia screening behaviour so indirect evidence is offered.

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[6] Although there are several presentation methods relating to numerical information, methods that manipulate how verbal information is presented are most relevant to health communication with this population and this section of the review will focus on reviewing these approaches. Readers are directed to Edwards et al. (2001) for a review of, non-theoretically driven information manipulation approaches.

Prospect Theory

Prospect Theory (PT, Kahneman & Tversky, 1981) was developed to account for decision making in economic scenarios that involve a risk although it has been used in health settings to examine the relationship between health information and behaviour. PT has three key assumptions. The first is that decisions involving a risk are influenced by subjective evaluations of the relative gains and losses of potential outcomes. The second, that people generally avoid risk (risk aversive), and will act to avoid a sure loss rather than for a sure gain. Thirdly, it suggests the way information is framed influences how possible gains or losses of engaging in the behaviour are perceived and can influence subsequent behaviour. That is, framing logically equivalent information differently can lead to different perceptions and behavioural outcomes (Gonzalez, Dana, Koshino, & Just, 2005). It suggests individuals will be more likely to engage in a health behaviour that involves a possible risk outcome (e.g. attending screening and risk being diagnosed with a disease) if clinical information is worded to emphasise the loss as opposed to a gain of attending (Rothman & Salovey, 1997). A loss-framed example is "if you do not attend an assessment and dementia is left undiagnosed you will not receive medication that could slow down the rate of cognitive decline and your quality of life will deteriorate."

Findings of framing effects on treatment, vaccination and health promotion behaviour are equivocal (Llewellyn-Thomas, McGreal, & Thiel, 1995; Moxey, O'Connell, McGettigan, & Henry, 2003), although evidence in oncology health screening scenarios is more consistent.

Consistent with PT predictions, written, video and telephone delivered loss-framed messages are associated with increased attendance for screening for cancer by older adults (Abood, Coster, Mullis, & Black, 2002; Banks et al., 1995; Lauver & Rubin, 1990; Myers et al., 1991; Schneider et al., 2001). In a review of four RCTs conducted in clinical settings with participants aged >50 years, Edwards et al. (2001) report that although effect sizes for framing manipulations were generally small, substantial effects in population terms might still be found. Indeed, loss-framed messages can increase attendance by six times compared to gain-framed messages (Abood et al., 2002), are effective with women with a poor history of utilizing health screening (Banks et al., 1995) and when combined with an ethnically targeted message, produce significantly higher take up rates for mammography screening in minority populations (Schneider et al., 2001).

Studies with adult participants also suggest loss-framing has a greater impact on increasing intentions and behaviour in individuals who are ambivalent about the illness for which they are being screened (e.g. Broemer, 2002), in scenarios where clients are less certain of the results of the assessment (Apanovitch, McCarthy, & Salovey, 2003; Lewis, Pignone, Sheridan, Downs, & Kisinger, 2003) and with individuals who are avoidant of health information, although the opposite holds for individuals who seek out health related information (Mann, Sherman, & Updergraff, 2004; Miller et al., 1999). Women with family histories of the disease being screened might be more susceptible to negative framing effects (Rothman & Salovey, 1997), although this finding has not been replicated (Finney & Iannotti, 2002; Williams, Clarke, & Boreland, 2001).

However, framing effects might have a finite impact as although loss framing messages significantly increase first round attendance for mammography screens, individuals who received loss-, positive- or neutral-framed letters do not differ on attendance for 2nd and 3rd screening (Finney & Iannotti, 2002). Thus, whilst framing effects might encourage clients 'through the door', their impact on repetitive screening behaviour is not well understood. This has implications for dementia screening and primary-care annual screening for the over 70s, as assessments can last several sessions over a number of weeks.

There are also important shortcomings in the literature about the wider impact of framing effects, in particular on patient satisfaction and understanding of the information, confidence in decision making and its impact on affect. This is problematic as health policy emphasises informing clients. Furthermore, tentative evidence e.g. Banks et al. (1995), suggests that compared to gain-frames loss framing could be associated with increased risk perceptions and poorer recall of information provided, and thus may impact on how informed clients are, and the meaningfulness of their informed consent. Hence, framing manipulations generate difficult tensions for clinicians, especially in dementia.

Although loss framing can increase screening uptake it may be unethical to use a methodology that manipulates risk aversion using negative messages (Finney & Iannotti, 2002). Indeed, framing approaches raise the question whether the goal of imparting information to clients is to increase adherence rates, or to facilitate patient autonomy. Edwards et al. (2001) argue that if it is the latter, the onus may be on clinicians to demonstrate they have avoided manipulating client choices. Whilst these concerns apply to all healthcare specialities, individuals referred for a dementia assessment could be disproportionately affected by framing manipulations.

For example, older adults may be more susceptible to loss framing effects compared to working age adults (Kim, Goldstein, Hasher, & Zacks, 2005; but see Mayhorn, Fisk, & Whittle, 2002; Ronnlund, Karlsson, Laggnas, Larsson, & Lindstrom, 2005). In addition, although Tversky & Kahneman (1981) argue framing effects operate on a cognitive level, evidence suggests negative frames generate negative affect, exacerbate feared outcomes in individuals, and that engaging in the screening behaviour could be an attempt to manage unpleasant emotions (Rottenstreich & Hsee, 2001; Williams et al., 2001). Given that individuals referred for a dementia assessment often present with affective disorders (Sinoff & Werner, 2004), negative frames could exacerbate a client's distress.

Cognitive theories, including fuzzy-trace (Reyna & Brainerd, 1991) also suggest framing effects arise from simplified and superficial information processing, in which older adults are more likely to engage (Brown & Park, 2003). Furthermore, individuals who process information in their right hemisphere, which is associated with heuristic, simplified processing, are more susceptible to loss framing and make more risk seeking decisions compared to left hemisphere processing, which is associated with analytic, rational decision making (McElroy & Seta, 2004). Gonzalez et al. (2005) also report that processing loss framed information appears to be a more, cognitively, effortful task. In sum, older adults with cognitive impairments, especially in the left hemisphere, could, due to reduced skills in rational decision making and fewer cognitive resources, be more vulnerable to framing effects. Similarly, the order in which information is presented can also influence health behaviour.

Order effects

Decision making and behaviour are sensitive to the temporal order of the presentation of information (Baird & Zelin, 2000). Information order can produce recency effects, namely, a cognitive bias whereby stimuli presented most recently have a disproportionate effect on impressions, observations or recall. Primacy effects, often known as anchoring effects (Mumma & Wilson, 1995), have also been reported; namely a cognitive bias for an initial impression to remain stable over time, even when new information is presented (Hogarth & Einhorn, 1992). Hogarth and Einhorn (1992) argue that information presentation order effects can impact on probability estimations, impression formation, attributions of performance, estimates of contingences, and guilt or innocence in trials. Hogarth and Einhorn (1992) have synthesised complex evidence relating to order effects, information processing, probabilistic reasoning and decision making and developed the Belief Adjustment Model (BAM) to account for these effects.

The Belief Adjustment Model

The BAM is a descriptive theory based on a general belief anchoring and adjustment model whereby current opinions (anchor) are adjusted by the impact of each new piece of information, which is known as belief updating (Hogarth & Einhorn, 1992). Order effects on decision making are achieved by combinations of the following: the characteristics of the information set (length, complexity and consistency); how information is processed (encoding route and belief updating); and, the mode of responding to it (sequential updating vs. end of information set). Variations in information set, processing route and mode of responding can produce primacy, recency or no effects in decision making and behaviour.

An impressive literature in non clinical settings provides support for presentation order effects, for example in juries (Kerstholt & Jackson,1998) auditor decision making (Johnson,1995), social-judgements (Buunk, 1998), financial investments (Baird & Zelin, 2000) and personnel interviews (Jensen, Watanabe, & Richters, 1999) Studies have also demonstrated information order effects in diagnostic decision making by clinicians (e.g.

Bergus, Chapman, Levy, Ely, & Oppliger, 1998; Chapman, Bergus, & Elstein, 1996; Cunnington, Turnbul, Regehre, Marriott, & Norman, 1997).

Although order effects on clinician decision making have been found, few studies explicitly test the BAM and this creates difficulties when synthesising findings, as recency and primacy effects on clinician decision making have been found. However, when placed within the framework of the BAM they are consistent with the predictions of the model. For example, Cunnington et al. (1997) reported primacy effects, as predicted by the model, for consistent, long information sets and Bergus et al. (1998) reported recency effects for short, inconsistent, complex, end of sequence decision making. Studies with mixed adult and older adult samples also suggest the temporal order of information may influence behavioural intentions for healthcare activities.

Evidence suggests that reading about the positive aspects of a treatment before reading the negative, e.g. side effects and risks of the procedures (positive–negative order manipulation) leads to significantly more favourable ratings, lower ratings of the influence of risk on their decision making, and significantly higher intentions to consent to the treatment, compared to the negative-positive presentation in hypothetical illness (Neto, Chen, & Chan, 2002) and low risk real illness scenarios (Bergus, Levin, & Elstein, 2002; Bergus, Levin, & Johnson, 1998). This effect was demonstrated for low-risk decisions about flu immunization and Aspirin therapy, but was not found for higher-risk decisions about surgical procedures (Bergus et al., 1998; Bergus et al., 2002). Bergus et al. (2002) suggest that in higher risk scenarios, order effects could be moderated by participants re-reading information, thus encouraging more deliberate decision making. They also suggest familiarity with the illness scenario could moderate order effects although this has not been tested. Although the findings in these studies are consistent, they are in the opposite direction to that predicted by the BAM, as all three studies used complex, inconsistent information sets and end of sequence decision making. However, none of the studies used manipulation checks to ensure that the information was novel, and if aspects of the information were familiar to participants, then primacy effects would be predicted by the model. Given that primacy effects have been reported in the literature, some advocate (e.g. Ley, 1989) utilising these effects in moulding communications with clients to encourage adherence.

There are, however conceptual and ethical issues about explicitly using information order manipulations. The BAM was developed and validated using adult-aged cognitively intact populations and little is known about its explanatory power in older adult health behaviour, including in those with cognitive impairments and affect disturbance. However, older adults referred for a dementia assessment could be more vulnerable to its effects.

Older adults might be more susceptible to primacy order effects in positive-negative presentations than younger adults when time limits are placed on decision making, although not when time constraints are removed (Ybarra & Park, 2002). Thus, older adults appear to have greater difficulty in incorporating negative information into, and revising, prior beliefs. Ybarra and Park hypothesise that time limitations in processing medical information interfere with social vigilance and the ability to be 'sceptical' about health messages. Related evidence suggests that, in general, older adults are less sceptical to health messages (Brown & Park, 2003).

Furthermore, normally ageing older adults show a primacy effect for recalling information pertaining to informed consent (Tymchuk & Ouslander, 1991) and individuals with cerebral pathology, acquired through injury (Carlesimo, Marfia, Loasses, & Caltagirone, 1996) or disease (Basso, Spinnler, Vallar, & Zanobio, 1982; Bayley et al., 2000) show impaired primary and recency effects. Impaired primacy and recency effects in recalling information also increase with increasing cerebral pathology (e.g. Burkart, Heun & Benkert, 1998; Pepin & Elsinger, 1989). Evidence also suggests individuals who display depressive symptoms are more susceptible to primacy information order effects (Gannon, Skowronski, & Betz, 1994). Studies of diagnostic sharing and treatment decision making studies with adult participants also suggest that primacy effects are shown in individuals when English is a second language (Andrews & Carroll, 1998).

Hence, order effects could influence older adults in different ways to younger, cognitively intact people. It is difficult, however, to avoid information order effects in clinical practice as information has to be presented to clients in sequence, either in written or verbal form. Clinicians may need to consider techniques to inoculate clients against bias e.g., note taking, asking client to recall the information, correcting errors and representing information not recalled, to prevent negative information from being 'buried' (Mumma & Wilson, 1995; Tymchuk & Ouslander, 1991). In the absence of such techniques, clinicians concerned about the impact of negative information about dementia assessments could take advantage of order effects by imparting negative information after positive information. Finally, more research is needed to establish the relationship between information order and satisfaction with information, confidence with decision, decision conflict, affect and comprehension and recall, as framing effects have been shown to have a wider negative impact on how informed clients are.

In addition to information presentation manipulations, an individual's dispositional coping style could also influence the impact of information.

Dispositional coping style: The Monitoring Process Model (MPM)

The MPM (Miller, 1987) is a coping style model that offers an account of how individuals manage, process and react to information conveying potential threats to their wellbeing and delineates psychological dispositions that may influence screening behaviour. It suggests there are stable, individual differences in how information about threatening events is selected, interpreted and processed (Shoda et al., 1998). The MPM posits two psychological coping approaches to managing information; high and low monitoring[7]. Individuals who are high monitors are vigilant, seek out and attend to information that is relevant to psychological and physical threats (Miller, 1996). Conversely, low monitors typically use cognitive and affective strategies to 'downgrade', avoid or distract from threat relevant information (Shoda et al., 1998). The MPM has been applied to a range of health conditions including cancer, HIV, dementia, coronary illnesses and health scenarios, for screening, adjustment to diagnosis, coping, recovery patterns and preventative health behaviour.

Oncology screening studies, with mixed adult/older adult (Andrykowski, Boerner, Salsman, & Pavlik, 2004) and older adult samples (Finney-Rutten, Meissner, Breen, Vernon, & Rimer, 2005) and a single dementia study using middle-aged and older adults (Roberts, 2000) have supported the main tenets of the model. Compared to low monitors, high monitors show superior adherence to screening programmes and monitoring status is an independent predictor of screening behaviour (Finney-Rutten et al., 2005) including genetic testing for dementia (Roberts, 2000). High monitors also typically have greater recall and comprehension of information (Miller, Brody, &

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[7] The MPM previously categorised people as either monitors or blunters. Empirical findings showed that the high/low monitor approach was more robust (e.g. S. Miller & M. Atchison, personal communication, May, 20, 2004)

Summerton, 1988). However, evidence from adult populations also suggests high monitors cognitively and emotionally amplify threat information, report increased perceived susceptibility of developing serious disorders, and have significantly greater numbers of intrusive thoughts and psychological distress, e.g. anticipatory anxiety, compared to low monitors (Schwartz, Lerman, Miller, Daley, & Masny, 1995; Tercyak et al., 2001). They may also be more likely to adopt long-term, ineffective, denial/disengagement coping strategies and, despite their active information seeking style, prefer a passive decision making role (Miller, Shoda, & Hurely, 1996; Miller et al., 1999). High monitors are more likely impulsively to engage in screening behaviour, without consideration of adverse psychosocial consequences (Miller, 1996). Thus, screening adherence in high monitors is achieved in the context of elevated psychological distress.

Accordingly, information may need to be tailored to coping disposition, and whilst high monitors prefer more information, they may also require additional support to help them accurately to perceive and respond to this information (Miller, 1996). Indeed, tailoring information to an individual's coping style can significantly increase screening adherence for 'blunters' (low-monitors) although not for high monitors (Williams-Piehota, Pizarro, Schneider, Mowad, & Salovey, 2005).

In sum, the MPM offers promise in accounting for screening behaviour in older adults, in particular its consideration of the role of affect and risk information and it could be useful to explore further in dementia. Preliminary evidence shows that combining HBM and MPM can account for as much as 50% of variance in behaviour (Roberts, 2000). There are, however, some conceptual issues with this approach.

Firstly, there have been challenges to the model's assumption of equivalence of low monitoring and high blunting. High and low monitors do not necessarily differ on their blunter scores and on other coping measures (Myers & Derakshan, 2000). These concerns are supported by the poor internal consistencies reported for the blunter subscale (e.g. Williams et al. 2005). In addition, whilst the MPM offers a description of dispositional coping styles it does not offer an account of the cognitive and affective processes underlying them. In an attempt to redress this, Miller et al. (1996) developed the Cognitive-Social Health information processing Model that proposes that coping is a process of health related encoding (self and situation), expectancies (processing expected outcomes and self efficacy to respond to them), affective responses, health values, and goals and competencies and self generated skills for the behaviour. Although this model has intuitive appeal it has only been empirically tested with adult samples in relation to adaptation after receiving diagnoses and only partially tested in relation to screening behaviour in oncology settings (e.g. Williams et al., 2005). Finally, there are also practical issues to consider in using this model in clinical settings, in particular how clinicians could assess dispositional coping, prior to seeking informed consent in assessment scenarios, and ethically whether it is appropriate to give low monitors less detailed and fewer pieces of information, as suggested by the model.

Summary of current knowledge of dementia screening behaviour

Dementia screening behaviour is likely to be influenced by attitudes about dementia (e.g. fatalism), perceptions of the utility of attending the screen (costs and benefits of attending), and by the support / influence of family or 'normative' cues. Indirect evidence suggests that additional social cognitive determinants warrant investigation, e.g. self efficacy, as do neuropsychological, developmental, spiritual, existential and religious determinants, which could act as powerful influences on dementia screening. Clinical information, the way it is expressed to the client, as well as the client's dispositional information coping style, could influence perception, satisfaction, recall and knowledge, and intentions /screening behaviour. Thus interventions to promote attendance will need to be multi-faceted.

However, perhaps the most striking finding is the lack of direct evidence of determinants of dementia screening behaviour, particularly of the role of neuropsychological variables and the impact of information pertaining to informed consent on intentions and screening behaviour. This omission is surprising given that some neuropsychologists are concerned about the impact of information and of the importance placed on sharing information by professional and policy guidelines. The significant gaps in knowledge of dementia screening behaviour, illustrate the need for a comprehensive research agenda.

Future research directions

Dominant health models, in their current form, do not offer a comprehensive account of dementia screening behaviour. Hence, to answer the question of what factors determine dementia screening behaviour researchers could explore two different agendas. Researchers could adopt a radical approach by initially focusing on qualitative designs with symptomatic and asymptomatic older adults to elucidate variables / themes to inform theory generation. Such an approach could form the basis of a new class of models developed to account for screening behaviour in neurodegenerative disorders.

Alternatively, a more pragmatic approach could be adopted and researchers could attempt to modify existing health behaviour models by adopting multi-model designs. For example, initial research suggests the HBM has some utility in this speciality, and its flexible structure, e.g. differentiating between different types barriers, suggest that it could provide the basis for an expanded model. Additional variables to explore include testing the additional cognitions associated with terminal illness, e.g. 'existential terror', the potential roles of neuropsychological functioning in different domains and the impact of health information. Given the early stage of dementia screening behaviour research, and clinician concerns about the impact of imparting information to clients on attending cognitive assessments, it may be some time before symptomatic samples, as required for neuropsychological studies, can be recruited. Collaboration with a primary care research network in GP surgeries with annual screening programmes may be one of the few practical ways to recruit the large numbers for a clinical sample, although this will not be without difficulty. Focusing on the role of health information using asymptomatic samples could provide the next stage of research. For example, within a broader SCM framework, such as the HBM, research could explore clinician concerns about the impact of information, particularly risk related information, on intentions to attend a cognitive assessment. Studies would also need to take account of not just the type of information imparted but how it is presented to participants and how dispositional information coping style could influence its impact. By doing so, this research would address an important gap in our knowledge of dementia screening behaviour whilst also testing clinician fears about the impact of information on dementia screening behaviour.

Conclusions

Identifying determinants of dementia screening behaviour poses a considerable challenge to researchers, but doing so could facilitate developing interventions to increase screening attendance. Dementia screening behaviour is likely to be influenced by complex interactions of attitudes, social influence, affect, neuropsychological variables and information imparted to clients. Whilst the small body of evidence reviewed offers some understanding of intentions for dementia screening there are important gaps in our knowledge. However, the importance of understanding determinants of dementia screening behaviour is likely to increase with advances in the detection and management of the disease process.

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Factors influencing intentions to attend a cognitive assessment: A multi model testing approach

Running Header: Intentions to attend a cognitive assessment

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Factors influencing intentions of asymptomatic older adults to attend a cognitive assessment: A multi model testing approach

Abstract

Part one of the study explored the influence of information about the possible outcomes of attending a cognitive assessment and the influence of the temporal order of the information on intentions to attend. Part two explored whether health beliefs and information coping style predicted assessment intentions.

Most asymptomatic older adult participants reported positive intentions to attend for a cognitive assessment both before and after being given additional information. However, being given information resulted in significantly more positive intentions. Reading positive then negative information about possible outcomes of the assessment was also associated with significantly stronger intentions to attend compared to reading negative information first. Monitor style was associated with the influence of information with formulating intentions, but not with intentions themselves. Regression analyses revealed that HBM variables of barriers, higher benefits than barriers and cues to action were predictive of intentions. However, when belief, influence and satisfaction of the experimental information were entered, only cues to action predicted intentions.

Key words: Dementia, screening intentions, information, order, Health Belief Model and Monitor Process Model.

Introduction

Dementia affects between 3 and 11% of individuals over 65 years and up to 20% over 80 years (Boustani et al., 2005). Although there is no cure, early diagnosis is important for maximising treatment effects (Barker et al., 2005). However, whilst older adults report moderate to strong intentions to attend for a cognitive assessment in hypothetical, symptomatic scenarios (Werner, 2003), and moderate (Boustani, Watson, Fultz, Perkins, & Druckenbrod, 2003) to strong support for routine dementia screening (94% take-up rate), less than half of these older adults attended a full dementia assessment when recommended (Boustani et al., 2005). Furthermore, there is often a considerable delay between symptom onset and assessment (Streams, Wackermarth, & Maxwell, 2003). Such delays in diagnosis compromise treatment efficacy. Therefore, there is increasing interest in elucidating factors which influence dementia assessment behaviour to inform interventions to promote attendance.

Evidence from non-neurological illnesses suggests that social-cognition variables are important and, potentially, malleable proximal determinants of screening behaviour (Armitage & Conner, 2000). The Health Belief Model (HBM, Rosenstock, 1974) is a social cognition model that has been used successfully to account for, and predict a range of screening behaviours.

The HBM suggests that when an individual is confronted with a threat to their health, health behaviour is the result of a cost/benefit analysis (Sheeran & Abraham, 1996). According to the model, an individual will attend a dementia assessment if s/he feels susceptible to developing dementia, and perceives the severity of developing dementia as serious. Additionally, if the individual perceives the benefits of attending the assessment outweigh the costs (barriers), is concerned about his/her health, and is exposed to prompts to attend the screening (cues to action), such as family support, then s/he will attend (Umeh & Rogan-Gibson, 2001).

Recently, studies have used the HBM to account for screening intentions for genetic and cognitive assessments for dementia. Although these studies have provided support for the HBM, only one published study (Werner, 2003) tested all the model's variables, making it difficult to determine the model's utility. Studies have also used different statistical methodologies to test HBM variables, which prevents synthesis of the literature.

Despite these concerns, Roberts (2000) using four of the five variables found in the HBM to predict intentions to attend a genetic test for dementia supported the HBM's core assumption that dementia screening behaviour could be influenced by a cost/benefit appraisal. Roberts (2000) found that higher perceived benefits than barriers (benefit minus barrier scores) were predictive of screening intentions in middle aged and older adults. High perceived susceptibility, but not severity, along with male gender and a coping style of seeking out health information were also predictive of positive intentions to attend, accounting for 50% of variance in findings. However, in the study's vignettes participants were told that their risk of developing dementia varied between 0 and 100%. This degree of test accuracy is not yet clinically available and may have inflated the perceived benefits of attending.

Studies of intentions to attend a cognitive assessment have focused on testing HBM variables as independent predictors. Werner (2003) found that, along with greater years of education and subjective concerns about memory, perceived barriers and cues to action to testing from significant others independently predicted intentions to attend a cognitive assessment for dementia in older adults. Conversely, neither susceptibility nor severity correlated with intentions and, although perceived benefits correlated with intentions it did not predict them. HBM variables accounted for 24% of variance in findings compared to 6% for demographic variables. A follow-up study testing the benefits and barriers variables also found that barriers and not benefits predicted intentions, although participants endorsed the benefits of attending as outweighing the barriers (Werner & Heinik, 2004). The HBM accounted for 27% of variance in findings compared to 20% for demographic variables.

In sum, evidence suggests several HBM variables can predict dementia screening intentions, although several variables have received weak or inconsistent support. The lack of support for perceived severity and conflicting support for susceptibility is consistent with the oncology screening literature (Curry & Emmons, 1994). However, the statistical analyses used may account for findings. Dementia screening studies have tested the severity and susceptibility variables as independent predictors and have not addressed the assumption that their inter-relationship may predict intentions (Strecher & Rosenstock, 1997). The lack of support for perceived benefits is contrary to many oncology studies (e.g. Hay et al., 2003).

This difference could reflect shortcomings in the questionnaires used, or in older adults' knowledge of the benefits of attending a dementia assessment, namely advancements in treatments (Werner 2004). It might also suggest that advancements in the treatment of dementia are not perceived as a benefit of attending and that benefits of attending are more subtle for dementia compared to oncology screening where benefits include curative treatments (Werner, 2003). Thus the current HBM might not offer a comprehensive account of dementia screening behaviour. Combining it with other health models could increase our understanding.

For example, the HBM and dementia screening studies have not considered the influence that information, imparted to clients during the process of gaining informed consent, could have on assessment behaviour. This is important, as imparting information to promote autonomy is required by national policy (National Service Framework, Department of health, 2001) and professional practice guidelines (British Psychological Society, 1995). Furthermore, some neuropsychologists are concerned that if clients are given information, for example regarding the limits of confidentiality or the legal status of cognitive assessment, it could increase client anxiety and lower adherence rates (Binder & Thompson, 1995). Clinicians also argue that it could interfere with the assessments' validity as clients may be less willing to disclose cognitive, psychosocial, or pre-morbid histories (Johnson-Greene, Adams, Hardy-Morais, Hardy, & Bergloff, 1997). Concerns about enhanced information sharing have not been tested and may be unfounded. However, a national survey suggested that less than half of psychologists undertaking cognitive assessments with older adults share key information (risks of attending, aims of testing and testing alternatives) pertaining to informed consent before, during or after the assessment (Morris & Bucks, 2004). Thus, establishing the impact of information on dementia screening behaviour is a research priority.

Indeed, studies exploring the impact of information in oncology screening suggest that information increases satisfaction with: the informed consent process, client participation in decision making, understanding of the risks and benefits of attending without increasing client anxieties and lowers decision conflict (e.g. Barlow & Wright, 1998; Hewiston & Austoker, 2005; Pinquart & Dubersetin, 2004). Conversely, it is also associated with lowering perceptions of disease susceptibility and efficacy of test procedures (Gattellari & Wards, 2003; 2005; Schwartz, Rimmer, Daly, Sands, & Lerman, 1999). Its impact on screening behaviour is equivocal, with studies reporting no (Milstein &Weinstein, 2002; Michielutte et al., 2005; Zhu et al., 2002), positive (e.g. Boundouki et al., 2004, Chua, Mok, Kwan, Yeo, & Zee, 2005; Humphries, Ireland, & Field, 2001) and negative impact (e.g. Adab et al., 2003; Berglund, Nilsson, & Nordin, 2005; Gattellari & Ward, 2003; 2005; Schwartz et al., 1999).

The negative impact of information on screening behaviour and intentions can, in part, be accounted for by the content of the information, how the information is presented to clients and by dispositional information coping style (Miller, 1996).

Consistent with clinician concerns, limited evidence suggests providing information about the risks associated with the outcomes of health procedures can lower intentions in cognitively intact and impaired older adult populations (Kim, Cox, & Cain, 2002; Sachs et al., 1994).

However, this negative effect appears to be influenced according to how this information is presented to clients (Edwards, Elwyn, Covey, Mathews, & Pill, 2001). For example, just as diagnostic decision making by clinicians is sensitive to the order in which information is given (e.g. Bergus, Chapman, Levy, Ely, & Oppliger, 1998), studies have shown primacy effects, namely a cognitive bias for an initial impression to remain stable over time, even when new information is presented (Hogarth & Einhorn, 1992), for clients' intentions in treatment scenarios. In low, but not high, risk hypothetical treatment scenarios studies with adult and older adults, participants show significantly higher favourability ratings of the treatment, report that risk information also has less influence on participant decision making and reported more positive intentions to attend when reading about the benefits of a treatment before the risks compared to reading risk information first (Bergus, Levin, & Elstein, 2002; Bergus, Levin, & Johnson, 1998; Neto, Chen, & Chan, 2002).

Although these studies have added to our understanding of the impact of order effects they were not tested within a theoretical framework. This is disappointing as the Belief Adjustment Model (BAM, Hogarth & Einhorn, 1992) offers a descriptive framework to account for such findings. It suggests that characteristics of the information imparted, the way it is processed and the mode of responding, can account for primacy, recency and no effects in decision making. The model has received support in non-clinical decision making, for example, in juries (Kerstholt & Jackson, 1998) social-judgements (Buunk, 1998) and personnel interviews (Jensen, Watanabe, & Richters, 1999). Clinical studies have also not explored the wider impact of information order effects on decision making, including such factors as satisfaction, recall and use of health information in health behaviour. This is problematic as Government policy outlines that the aim of imparting information is to inform and enhance client autonomy (Department of Health, 2001). Moreover these effects have not been investigated with older adults in dementia screening scenarios. Given that primacy and recency recall effects are common in older adults, including for information to gain informed consent for health care activities (Tymchuk & Ouslander, 1990) and are impaired in those with dementia (e.g. Burkart, Heun, & Benkert, 1998) it is important to establish the impact of information order on health behaviour in this population.

Finally, an individual's dispositional information coping style can impact on how information about potential risks and threats to wellbeing is selected, processed and reacted to. According to the Monitor Process Model[2] (Miller, 1996), individuals with a 'low monitor/high blunting' coping style typically attempt to downgrade or avoid threat relevant information. Conversely, high monitors seek out information, for example relating to diagnosis or treatments. High monitor adult participants in cancer screening studies also show greater adherence to diagnostic screening programmes compared to low monitors (e.g. Christenson, Moran, Lawton, Stallman, & Voigts, 1997; Miller, Brody, & Summerton, 1988; Shoda et al., 1998), However, high monitors cognitively and emotionally amplify threat information, are more likely to engage impulsively in screening programmes without considering the

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[2] The MPM was previously known as the Monitor – Blunter model and previously categorised people as either monitors or blunters. More recent research suggests that the high / low monitor approach is more robust (e.g. Williams-Piehota, Pizarro, Schneider, Mowad, & Salovey, 2005)

impact of findings, and adopt long-term, ineffective coping strategies (Miller, 1996). Thus, higher adherence may be achieved at the expense of increased personal distress. Although no published study has examined the influence of informational coping style on intentions to attend a cognitive assessment for dementia, Roberts' (2000), study of intentions to attend a genetic test for dementia found that monitor style predicted intentions.

Taken together, studies stress the importance of considering the influence of information on health behaviour in order to develop more comprehensive accounts of screening for dementia and could inform interventions to promote attendance.

This study explored theoretical predictors of intentions to attend a cognitive assessment for dementia whilst manipulating the order of information provided regarding the possible outcomes of the assessment in an UK older adult sample. The impact of the information on cognitive screening intentions was selected as the main dependent variable in order to test clinicians' core fears and assumptions; namely, that imparting information about the potential outcomes of an assessment will have a negative impact on assessment intentions and behaviour. Part one examined the impact of information, and its order, on the possible outcomes of attending a cognitive assessment. Namely, whether imparting information about possible positive and negative outcomes of attending an assessment influences intentions and whether the order in which information is presented also impacts on intentions. A within-subjects design was used to test if there was a difference in intentions to attend a cognitive assessment when participants received no information or when information was provided about possible benefits or negative outcomes of attending. A between subjects design examined the possible impact of information order. Participants rated intentions to attend, confidence in their decision, satisfaction with the information, perceived costs and benefits of attending, and anxiety. Part two explored whether the Monitor Process and Health Belief Models, and health information variables are predictive of screening intentions (Appendix 5 contains an illustration of the study design).

Methodology

Participants

Potential participants aged ≥50 years were identified from an asymptomatic sample of employees from two large superstores, an older adult volunteer panel at the University and personal contacts. Individuals who could not consent, reported significant concerns about their memory, or were awaiting a cognitive assessment were excluded, as were those scoring ≤14 on a telephone screen for dementia (TELE; Gatz et al., 1995).

Measures

Participants' gender, age, years of education, subjective concerns about memory, family history of dementia, nationality and marital status were recorded.

The TELE (Gatz et al., 1995). The TELE consists of ten items assessing orientation, memory (recall) and executive functioning. The lower the total score (max. 20), the more severe the cognitive impairment. It discriminates well between individuals with Alzheimer Disease and healthy controls, and correlates positively with the MMSE (.87), and the Clinical Dementia Rating Scale (-.71), both measures of cognitive deficit severity (Jarvenpaa et al., 2002).

Vignettes

Baseline. Participants read a vignette describing dementia based on that used by Werner (2003)[3]. They then rated their intentions to attend a cognitive assessment.

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[3] Werner's (2003) vignette described the individual as losing keys and forgetting things, and having a family history of dementia. Piloting of the questionnaires with three older adults (≥55) suggested that participants who believed they had no family history of dementia had difficulty accepting that the baseline vignette could be true of them. Accordingly, reference to a family history of dementia was removed.

Experimental (1-6). Participants then read one of six vignettes giving information about the possible outcomes of attending a cognitive assessment. Five experienced chartered Clinical Psychologists working with older adults listed the positive and negative outcomes of attending a cognitive assessment encountered in their practice. The lists of positive and negative outcomes of attending a cognitive assessment were then ranked by 10 older adults in terms of the importance of being aware of each issue before consenting to attend an assessment (Appendices 6 & 7). Rank totals were calculated for positive and negative lists. Lower ranks indicated greater importance. The two outcomes scoring the lowest mean rank total from each list were used in the vignettes: Positive outcomes, “finding out whether I do or do not have memory difficulties”, and “If I do have memory difficulties I might receive medication to slow down the rate of memory decline”; Negative outcomes, “The findings could confirm that I have a progressive degenerative disease (e.g. Alzheimer’s Disease)”, and “Adjusting to a diagnosis of dementia can be distressing” were used.

Vignette 1, contained positive outcomes only. Vignette 2. contained negative outcomes only. Vignettes 3. to 6. presented the positive and negative outcomes in different orders to examine order effects: positive sandwich (+ - - +); negative sandwich (- + + -), and, two derived from the Belief Adjustment Model (Hogarth & Einhorn, 1992), positive first (+ + - -); and, negative first (- - + +). Taking into account information framing effects (Tversky & Kahnman, 1981), positive information was gain framed, all other information was presented using neutral framing (See Appendix 8).

Manipulation checks for vignettes

Participants were asked to rate their belief in and use of the information in the baseline and experimental vignettes using 5-point rating scales: belief that the baseline vignette could be true of them (-2 "totally disbelieve" to +2 "totally believe"); influence of the symptom information on intention to attend the assessment (0 "did not influence at all" to 4 "very much influenced"); how much they believed the information given about the cognitive assessment (-2 "totally disbelieve" to +2 "totally believe"); and, the influence of the assessment information on intention to attend (0 "did not influence at all" to 4 "very much influenced").

Dependent measures

Participants completed four rating scales to assess intentions, confidence, satisfaction and beliefs about the assessment at baseline and after being provided with additional information: willingness to participate in a cognitive assessment (-2 "definitely not willing" to +2 "definitely willing"); confidence in their decision (-2 "extremely unconfident" to +2 "extremely confident"); satisfaction with the information provided (-2 "extremely dissatisfied" to +2 "extremely satisfied"); and, the benefits of attending the assessment outweighed the costs (-2 "totally disagree" to +2 "totally agree").

Psychological Measures

State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970). The STAI contains two, 20 item scales assessing trait and state anxiety. Participants respond to statements on a four point scale (1 "almost never" to 4 "almost always"). Higher scores indicate higher levels of anxiety. Both scales were completed after reading the baseline vignette (T^1). The STAI (State) was repeated after reading the experimental information (T^2) to assess for changes in anxiety.

Health Belief Questionnaire. Werner's (2003) HBM questionnaire was used. It has 12 questions with five subscales testing susceptibility, severity, barriers, benefits and cues to action, co-efficients for which ranged from, $\alpha = .45$ to .89. The original questionnaire is in Hebrew. It was translated into English and then back translated (Behling & Law, 2000). A third translator checked this back-translation for differences in language or meaning. No modifications were required. The original questionnaire used rating scales scored 1 to 5 and 1 to 7. For consistency, scale anchors were changed to 0 to 4 or -2 to +2, as appropriate (Manstead & Hewstone, 1995; Sansone, Morf, & Panter, 2004). The HBM questionnaire assessed severity, and susceptibility (0 "No risk at all" to 4 "very high risk"), benefits and barriers (-2 "entirely disagree" to +2 "entirely agree"), and cues to action (0 "Definitely not support me" to 4 "definitely support me"). Items on the HBM questionnaire were:

Perceived barriers. Participants rated their agreement with three statements: "Cognitive assessments are a waste of time as they are not predictive of future changes"; "Results would cause too much worry"; and, "Waste of time as no treatments available".

Perceived benefits. Benefits of attending were assessed with four statements: "Can help me find a treatment"; "Can help me make plans for the future"; "Results can allow my doctor to advise on future treatments"; and, "Knowing I don't have memory problems will improve my quality of life".

Perceived susceptibility. Susceptibility to developing dementia was tested by two items "Life time risk of developing AD" and "Risk in the next five years".

Perceived severity. Severity of AD was tested with two questions: "How much stress"; and "Worry" developing AD would cause.

Cues to Action. Cues were assessed on a single item: "People important to me would support me attending the assessment"

The Monitor Blunter Style Scale (MBSS; Miller, 1987). The MBSS was used to assess information coping style. It uses responses from four hypothetical situations to classify individuals as hi/low monitors/ blunters. Based on the mean, participants are divided into high /low monitors/blunters. Whilst evidence suggests the monitor subscale has good internal consistency, significant concerns about the reliability of the blunter subscale have been reported (Williams et al., 2005). Thus, only the monitor subscale scores were used; as suggested by S. Miller & M. Atchison (personal communication, May 20, 2004).

Procedure

Following ethical approval (Appendix 9), participants who read an information sheet (Appendix 10) and returned a signed consent form (Appendix 11) were contacted by telephone to complete the TELE. Those scoring ≥15 were posted a questionnaire pack to complete and return Freepost.

Data Analyses.

Analysis was conducted using SPSS for Windows (Release 12.0, 2004). Kolmogorov-Smirnov tests indicated that most variables were not normally distributed and, non-parametric tests were selected where possible. The impact of information was explored using Kruskal-Wallis, Wilcoxon ranked and Mann Whitney *U* tests. Associations between Monitor status and the dependent measures were explored using chi – square (Fischer's Exact scores are reported for expected cell counts less than five). Associations were explored using Spearman's rho.

Transformation of the variables, as per Tabachnik and Fidell (1996), did not result in normally distributed data. However, multiple regression is a relatively robust method and can be used if the residuals rather than the variables themselves are normally distributed (Howell, 1992). Since transformation did not appreciably improve the distributions of the variables the original variables were used for the regressions as this makes interpretation of findings easier. The distributions of standardised and unstandardised residuals were explored for all regression analyses and all were normally distributed (as per Frost, Myers, and Newman, 2001). Two regression models were generated. The first examined the predictive power of HBM variables as independent predictors combined information variables, and the second using HBM composite scores combined with information variables.

Results

Response Rates

Of 150 people approached, 127 (85%) returned signed consent forms. Three were not eligible (<50 years). Four withdrew prior to screening; two due to poor health and two for unknown reasons. Two were not screened because of concerns about their memory. Of the remaining 118 (93%; TELE median 19.5, range 17 – 20) sent one of six versions of the questionnaire pack, 112 (95%) returned completed questionnaires.

Demographic and descriptive information

Table 1 summarises descriptive information for participants who completed the study, and for participants who screened but did not return a questionnaire. There were no significant experimental group differences for gender, $\chi^2(5) = 2.30, p = .824$; family history of dementia, $\chi^2(5) = 4.24, p = .522$; marital status, $\chi^2(25)$ 14.47, $p =$ .996 or nationality, $\chi^2(20)$ 17.44, $p =.531$. Nor were there significant group differences for age, $H(5) = 1.73, p = .885$, TELE total scores, $H(5) = 9.42, p = .094$, or years of education, $H(5) = 1.60, p = .906$.

Part one: The impact of information on intention to attend a cognitive assessment

Vignettes: Manipulation checks

Median ratings of belief in the dementia symptoms (1.0; Moderately) and influence of the information (2.0; Influenced somewhat) indicated that most participants believed the vignettes could apply to them and that their responses were influenced by the content of the baseline vignette (see Table 2). Similarly, median ratings of belief in the information provided about the assessment in the experimental vignettes (1.0; Moderately) and influence (3.0; Influenced a lot) indicated that most participants also believed in and were influenced by the experimental vignettes.

Table 1: Descriptives

M (*SD*)	Experimental Conditions *N* = 112						Non responders *N* = 6
Characteristic	Positive information only (*N* = 20)	Negative information only (*N* = 18)	Positive information Sandwich (*N* = 19)	Negative information sandwich (*N* = 18)	Positive information first (*N* = 18)	Negative information first (*N* = 19)	
Age	65.1 (7.0)	66.7 (7.4)	65.6 (7.8)	64.2 (7.8)	64.9 (7.5)	64.8 (6.8)	67.3 (10.7)
Gender F (%)	12 (60%)	11 (61%)	10 (53%)	13 (72%)	11 (61%)	10 (53%)	3 (50%)
Nationality (*n)*							
British	15	12	12	11	13	12	2
Welsh	0	0	4	0	0	0	1
Irish	4	5	1	5	3	6	3
Scottish	0	0	0	1	1	0	0
Marital Status (*n)*							
Single	2	1	1	2	2	2	4
Married	14	12	15	14	11	12	0
Co-habiting	0	0	1	1	1	0	0
Divorced/separated	2	2	0	0	1	1	1
Widowed	2	3	2	1	3	4	1
Years of Education	12.8 (2.4)	13.5 (2.4)	13.4 (3.2)	13.8 (4.2)	14.5 (3.8)	13.5 (3.2)	13.2 (2.2)
Family history of AD (YES)	2 (10%)	5 (28%)	6 (32%)	4 (22%)	4 (22%)	6 (32%)	0
TELE total score (max. 20)†	19.5	19.5	19.0	20	20	19	19.8
STAI Trait total score (max. 80)†	35.0	34.0	28.0	30.5	30.5	33.0	-

Note. F = females; TELE = Telephone Screen for Dementia (Gatz et al., 1995); STAI = State Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970): † Median score.

There were no significant differences between experimental groups in belief in, $H(5) = 2.10$, $p = .838$; use of the baseline symptom information, $H(5) = 2.20$, $p = .824$; in belief in, $H(5) = 2.82$, $p = .728$ or use of the information in the experimental vignette, $H(5) = 10.27$, $p = .068$[4]. Participants who responded negatively to one or more of the manipulation questions (35, 31%) were excluded from the analyses for Part one of the study, resulting in 77 (69%). Statistical comparisons of demographic variables for the experimental groups were repeated, all *p*s <.05.

Table 2: Participant responses to manipulation check questions

N, %	Manipulation questions (*N* = 112)				
	Belief in vignette information			Use of information	
	Moderately to totally believe (score 1 to 2)	Neither believe or disbelieve (score 0)	Moderately to totally disbelieve (score $^{-}2$ to $^{-}1$)	Influenced a little to very much (score 1 to 4)	Did not influence at all (score 0)
Baseline symptom vignette	86 (77%)	8 (7%)	18 (16%)	96 (86%)	16 (14%)
Experimental vignette	101 (90%)	5 (5%)	6 (5%)	106 (95%)	6 (5%)

Baseline intentions, confidence in decision and perceived costs/benefits

At baseline, participants generally reported positive intentions to attend an assessment, were confident about this decision, satisfied with the information provided about the assessment and believed that the benefits of attending outweighed the costs (See Table 3).

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[4] Although this finding approached significance, which could be interpreted as questioning the independence of the manipulation question from the experimental condition, it was still retained in this study.

Table 3: Descriptives dependent variables at baseline and after experimental information

	Experimental conditions																	
Median, Mode,	Positive Only			Negative Only			Positive Sandwich			Negative Sandwich			Positive First			Negative First		
range	*N* = 13			*N* = 16			*N* = 13			*N* = 11			*N* =12			*N* =12		
Intentions to attend (ITA)																		
ITA^1	2,	2	(1-2)	1,	1	(¯1-2)	2,	2	(1-2)	1,	1	(¯2-2)	1,	1	(¯1-2)	1.5,	2	(0-2)
ITA^2	2,	2	(1-2)	2,	2	(1-2)	2,	2	(1-2)	1,	1	(1-2)	2,	2	(1-2)	1	1	(¯1-2)
ITA^{change}	0,	0	(¯1-1)	0,	0	(¯2-1)	0,	0	(0-1)	0,	0	(¯3-1)	0,	0	(0-2)	0,	0	(¯1-0)
Confidence in decision (Conf)																		
Conf^1	1,	1	(1-2)	1,	1	(0-2)	1,	1^α	(0-2)	1,	1	(1-2)	1,	1	(1-2)	1.5,	1^α	(1-2)
Conf^2	1,	1	(1-2)	1,	1	(0-2)	2,	2	(0-2)	1,	1	(1-2)	1,	1	(1-2)	1,	1	(1-2)
Conf^{change}	0,	0	(¯1-1)	0,	0	(¯1-1)	0,	0	(¯1-1)	0,	0	(¯1-1)	0,	0	(¯1-1)	0,	0	(0-1)
Satisfaction with information (Sat)																		
Sat^1	1,	1	(0-2)	1,	1	(¯2-1)	1,	1	(0-2)	1,	1	(0-1)	1,	1	(¯1-2)	1,	1	(¯1-2)
Sat^2	1,	1	(1-2)	1,	1	(¯1-2)	1,	1	(¯1-2)	1,	1	(0-1)	1,	1	(0-2)	1,	1	(¯1-2)
Sat^{change}	0,	0	(¯1-0)	0,	0	(¯1-1)	0,	0	(¯1-2)	0,	0	(¯1-0)	0,	0	(¯1-1)	0,	0	(¯2-1)
Risk & Benefits (R&B)																		
R&B^1	2,	2	(1-2)	2,	2	(0-2)	2,	2	(0-2)	1,	1	(0-2)	2,	2	(1-2)	1,	1	(0-2)
R&B^2	2,	2	(1-2)	2,	2	(0-2)	2,	2	(1-2)	1,	1	(1-2)	2,	2	(1-2)	1,	1^α	(1-2)
R&B^{change}	0,	0	(0-1)	0,	0	(¯1-1)	0,	0	(1-2)	0,	0	(¯2-1)	0,	0	(0-1)	0,	0	(¯1-0)
STAI (state) (STAIs)																		
STAIs^1	30.0,	30^α	(21-55)	29.0,	23,	(22-40)	27.0,	20^α	(20-57)	29.0,	25	(20-45)	31.5,	22^α	(20-42)	27.5,	21^α	(20-40)
STAIs^2	29.0,	20^α	(20-47)	29.5,	20^α	(20-37)	23.0,	23	(20-58)	27.0,	29	(20-34)	28.5,	21	(20-41)	22.5,	21	(22-42)
STAIs^{change}	1,	1	(¯7-14)	0,	0	(¯6 - ¯3)	1,	0^α	(¯6-11)	2,	¯1	(¯2-12)	1,	1	(¯5-6)	1.5,	0	(¯5-12)

Note. ^{1} baseline assessment; ^{2} assessment following experimental information; ^{change} change in responses score; α = multiple mode values, lowest value shown

Information manipulation and intentions

After reading the experimental information, participants reported significantly more positive intentions to attend, $T(N = 77) = -2.34, p = .019$. Across experimental groups, 16 (21%) reported being more rather than less likely to attend. Six (8%) decreased their intentions, although only one participant reported a decision change from positive to negative intentions.

There was also a significant main effect of information on the STAI state subscale, $T(N = 77) = 2.96, p = .003$, with 43 (56%) participants scoring lower on the STAI state subscale at T^2, compared to T^1, although 22 (29%) scored higher. Experimental information did not affect perception of the risks and benefits of attending, $T(N = 77) = -1.17, p = .244$, confidence in the decision, $T(N = 77) = -0.47, p = .637$, or satisfaction with information, $T(N = 77) = -1.61, p = .108$.

Impact of experimental condition

Within condition. Comparisons of dependent variable ratings (baseline and experimental) within each of the six experimental conditions revealed that, once a Bonferroni correction was applied, there were no significant differences within the experimental conditions on intentions, confidence in decision, perceptions of risks of attending and satisfaction with information all $ps > .015$ (see Table 5, Appendix 12).

Between condition. To explore the impact of the six experimental conditions change scores were calculated; intentions to attend at time two were subtracted from baseline scores ($ITA^1 - ITA^2$) to create an intentions change score (ITA^{change}). This process was repeated for all DVs. Negative scores indicated reduction in intentions, belief, confidence or anxiety. No significant effects of experimental condition were found: change in intentions, $H(5) = 9.65, p = .086$; confidence, $H(5) = 3.86, p = .569$, perception of risks or benefits of attending $H(5) = 5.40, p = .364$; satisfaction with the information provided, $H(5) = 2.91, p = .715$; state anxiety $H(5) = 3.33, p = .659$. That is, although information increased intentions to attend, the type of information provided did not influence intentions, confidence, satisfaction, perception of risks or benefits, or state anxiety.

Planned post hoc comparisons of information type and order effects

Although there was no significant main effect of experimental group, evidence from the literature suggested there may have been subtle, but significant, differences between type and order of information (Hogarth & Einhorn, 1992; Wroe & Salkovkis, 1999). Planned comparisons were undertaken to compare: positive and negative information only; positive and negative sandwich; and, positive and negative information first for all dependent variables. There was a significant difference in change scores only between the positive and negative information first groups and only for intentions to attend, $U = 35.00, p = .008$, with receiving positive information before the negative associated with significantly higher intentions. All other comparisons *ps* > .05 (See Table 6 Appendix 13).

Demographic variables and information

Gender, family history of dementia, age, education and TELE score were not associated with intentions, satisfaction, confidence in decision, perception of risks and benefits, or state anxiety, at baseline, or after reading the experimental information, all *ps* > .05 (see Tables 7 & 8, Appendices 14 & 15).

In sum, imparting information about the possible outcomes of a cognitive assessment to older adults significantly increased intentions to attend a cognitive assessment, and lowered state anxiety levels. Perceptions of the risks and benefits of the assessment, satisfaction with the information and confidence in the decision were not influenced by the information provided.

Part two: Theoretical predictors of intentions to attend a cognitive assessment

Data from all participants were included to explore predictors of intentions.

Monitor Process Model

Chi square tests were conducted exploring the association between hi/low monitoring and rating scale scores for each DV at baseline, after the experimental condition and, change scores. There was a significant effect of monitor status on the use of experimental information only, χ^2 (4) =14.05, $p = .004$, with high monitors reporting significantly greater use of information to inform intentions (see Table 9, Appendix 16)[5]. That is, monitor status was not associated with intentions, satisfaction with the information, perceptions of risks of attending, confidence in decision, anxiety ratings or belief in the experimental information.

Health belief model

Internal consistency of the UK HBM questionnaire was acceptable for the susceptibility (α .73), severity (α .93), and benefits (α .64) subscales, with the exception of barriers (α .57) (Howell, 1992). Exploring the distribution of barrier scores and intercorrelations between the three items suggested two items, “Waste of time as tests aren’t predictive” and “Waste of time as there are no effective treatments” were strongly correlated (r =.50, p = .001), and appeared to measure the same underlying construct; the third item, “Worry about the findings” correlated less well (r = .24, p = .018, r = .23, p = .018 respectively) with the other two. Hence, the ‘Worry about findings’ item was treated as an independent predictor (as per Frost et al., 2001). Internal consistency for the revised two item barrier subscale was .64.

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[5] Selecting participants for Part one (p.103) without the ‘use of information’ question resulted in identical excluded participants.

The median, mode and range scores for the HBM were as follows, Susceptibility (3, 2, 0-6), Severity, (6, 6, 0-8), Benefits, (4, 4, ¯1-8), Barriers (¯2, ¯2, ¯4 -3), worry about the findings (¯1, ¯1, ¯2-2) and Cues to action (3, 3, 0-4).

Predictors of intentions

An exploratory correlation matrix to examine relationships between HBM variables, non HBM variables and intentions assessed after experimental information (ITA^2) was generated, see Table 4.

Taking into account the different ways of testing the HBM and using the methodologies of Roberts (2000) and Sheeran and Conner (1996), composite HBM indices were created; severity plus susceptibility score, and benefits less barriers score. These were also entered into the correlation matrix. The HBM subscales; the two HBM composite scores and the three information variables (belief in, use of and satisfaction with the information) correlated with intentions but not worry about the findings, demographic variables, state anxiety or TELE scores. Only those variables which correlated significantly at a univariate level with intentions were used in the regression analyses.[6]

Two analyses were conducted. The first used individual HBM and information variables as predictors. The second used the two composite HBM variables plus Cues to Action and the information variables. For each regression, HBM variables were entered at step one and the information variables at step 2. For a summary of the regression analyses, see Table 5.

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[6] The reader will note that the correlations between the benefits less barriers and the barrier and benefits subscales, and between the severity plus susceptibility and susceptibility variables were >.7, suggesting collinearity between the variables. However, in the regression analyses used in this study, the benefits less barrier variable was not used in the same regression model as the benefits and barrier variables and the severity plus susceptibility and susceptibility variables were also not used in the same regression model. Furthermore none of the other correlations reached .7, which suggested that there was not a problem of collinearlity between the variables (Bryman & Cramer, 1994).

Table 4: correlations between intentions after experimental information (ITA^2), HBM and non HBM variables (N=106-112)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Intentions (ITA^2)															
2. Age	-.08														
3. Years of Education	.17	.08													
4. The TELE total	-.12	.06	.29‡												
5. HBM Cue to action	.47‡	.04	.03	.08											
6. HBM Benefits less barriers	.45‡	.05	-.01	.01	.38‡										
7. HBM benefits	.34‡	.05	-.09	.04	.30‡	.89‡									
8. HBM barriers	-.48‡	-.01	-.09	.15	-.07	.82‡	-.52‡								
9. HBM worry about findings	-.17	-.03	-.26†	.03	-.39‡	.28‡	-.23‡	.27‡							
10. HBM Severity plus susceptibility	.34‡	.12	-.01	-.02	.13	.28‡	.12	-.25‡	.12						
11. HBM severity	.22†	.01	-.02	.04	.10	.21†	.19†	-.18	.19†	.42‡					
12. HBM susceptibility	.27‡	.13	-.01	.04	.23†	.21†	.13	-.26‡	.06	.85‡	.18				
13. Influence of the information	.47‡	-.14	.17	.03	.29‡	.42‡	.33‡	-.47‡	-.10	.11	.11	.16			
14. Belief in assessment information	.47‡	.05	.10	.12	.34‡	.32‡	.35‡	-.23†	-.25‡	.11	.05	.13	.32‡		
15. Satisfaction with the assessment information	.34‡	-.05	.01	.01	.29‡	.33‡	.24†	.34‡	-.25‡	.01	.06	.06	.25‡	.55‡	
16. STAI state	-.11	-.17	-.24†	.03	-.02	.01	-.06	.10	.37‡	.23†	.11	.17	-.06	-.06	-.20†

Note. TELE = Telephone screen for dementia total score; HBM = Health Belief Model; †$p < .05$; ‡$p < .01$; STAI state = State Trait Anxiety Inventory State score.

Model 1: HBM and information variables. At Step 1, the model significantly predicted intentions, F (5, 105) = 7.74, $p < .001$, $R^2 = .28$, with cues to action and barriers significant predictors of intentions to attend a cognitive assessment. When the information variables were added, the explanatory power of the model significantly increased, F (8, 105) = 8.67, $p < .001$, $\Delta R^2 = .14$, $p < .001$. However, whilst belief and use of the assessment information significantly predicted intentions, neither cues to action, nor barriers continued significantly to predict intentions.

Model 2: Composite HBM and information variables. At Step 1, the HBM model significantly predicted intentions, F (3, 105) = 11.17, $p < .001$, $R^2 =. 25$, with cues to action and benefits less barriers being significant predictors. Adding information variables, again, added to the predictive power of the model, F (6, 105) = 10.96, $p < .001$, $\Delta R^2 = .15$, $p < .001$. In the final model, cues to action, and belief and use of the assessment information significantly predicted intentions; barriers was no longer a significant predictor of intentions.

Mediation effect. Both of the regression models revealed a mediation effect. Specifically, belief in and use of the clinical information appeared to mediate the relationship between perceived barriers and intentions to attend a cognitive assessment. According to the three criteria suggested by Baron and Kenney (1986) belief in and use of (influence) clinical information acted as mediating variables as; (i) perceived barriers was related to intentions to attend (outcome measure), (ii) perceived barriers was associated at the univariate level with belief and use of information, and (iii) after controlling for the effects of the belief and use of clinical information (mediator variables) the relationship between perceived barriers (the predictor) and intentions (outcome variable) was significantly reduced. Belief and use of the information may also have mediated the relationship between cues to action and intentions, as the strength of the relationship between cues to action and intentions was reduced when controlling for information in both models. However, there was no evidence of a significant univariate association between cues to action and belief and use of information (see Table 4).

Table 5: Summary of hierarchical regression analyses for variables predicting intentions to attend for cognitive assessment (ITA^2; $N = 106$)

	Variable	B	*SE B*	ß
	Model 1: Health Belief Model and Information variables			
Step 1	HBM Cues to action	.24‡	.08	.28
	HBM Barriers	-.14‡	.05	-.28
	HBM Benefits	.02	.04	.06
	HBM Susceptibility	.06	.05	.11
	HBM Severity	.03	.04	.07
Step 2	HBM Cues to action	.15α	.07	.17
	HBM Barriers	-.08	.05	-.16
	HBM Benefits	-.01	.03	-.04
	HBM Susceptibility	.06	.05	.11
	HBM Severity	.03	.04	.07
	Influence of information ^{2}	.17‡	.06	.26
	Belief in assessment information ^{2}	.20†	.08	.22
	Satisfaction with information ^{2}	.10	.08	.11
	Model 2: Composite Health Belief Model and Information variables			
Step 1	HBM Cues to action	.26‡	.08	.30
	Benefits less barriers	.07‡	.02	.28
	Susceptibility plus severity	.05	.05	.09
Step 2	HBM Cues to action	.15†	.07	.18
	Benefits less barriers	.02	.02	.09
	Susceptibility plus severity	.01	.05	.11
	Influence of information ^{2}	.19‡	.06	.28
	Belief in assessment information ^{2}	.18†	.08	.20
	Satisfaction with information ^{2}	.13	.08	.14

Note. HBM = Health Belief Model; ‡$p < .01$; †$p < .05$; α$p = .051$

Discussion

The aims of this study were to ascertain the impact of information about the possible outcomes of a cognitive assessment on intentions to attend, whether the order of information influenced intentions and to identify theoretically driven predictors for intentions.

The first finding of note was that most participants reported positive intentions to attend a cognitive assessment. This was consistent with Boustani et al. (2005), who reported a 6.5% decline rate for initial cognitive assessment behaviour in asymptomatic older adults.

Part one: The impact of information on intentions

When older adults have expressed a positive intention to attend a cognitive assessment based on the presence of possible dementia symptomatology, imparting information about some of the possible outcomes of the assessment, either negative or positive, does not appear negatively to impact on intentions or to increase state anxiety. Indeed, imparting information significantly increased intentions, albeit for fewer than a third of participants. Given that most participants reported positive intentions at baseline, it was not, therefore, possible to determine the impact of information on individuals expressing negative intentions prior to reading health information. Providing participants with information about the cognitive assessment did not increase participant satisfaction with the information although generally positive satisfaction ratings at baseline could account for this.

Taken together, these results tentatively suggest that contrary to the concerns of clinical psychologists (Binder & Thompson, 1995; Morris & Bucks, 2004) providing information did not change perceptions of the risk of attending for cognitive assessments. Thus, their concerns may be unfounded, at least in those individuals who have previously reported positive intentions to attend.

Given the failure to find a main effect of information order (experimental group), the significantly higher intention scores found for the positive vs. negative information first groups needs to be interpreted with caution. However, this finding is consistent with previous research in treatment scenarios reporting primacy effects for information on intentions (Bergus et al., 2002; Bergus et al., 1998; Neto et al., 2002), social vigilance studies of health decision making (Ybarra & Park, 2002) and with the BAM as the study used a long, complex and inconsistent information set and step by step decision making (Hogarth & Einhorn, 1992). Moreover, higher intentions in the positive first vs. negative first presentation were not associated with increased anxiety or increased perception of risk in attending. This is encouraging as other presentation manipulations, such as loss framing, do appear elevate levels of anxiety (Banks et al., 1995). However, this finding needs replicating, ideally with individuals referred for screening. In the absence of a clinical study it may still be appropriate for clinicians to incorporate techniques to moderate information order effects in clinical practice, for example, asking client to takes notes, to recall the information, correcting errors and representing information not recalled, so as to avoid primacy or recency (Mumma & Wilson, 1995).

Vignette manipulation checks

The finding that nearly a third of the sample either did not believe or use the information in the vignettes in formulating intentions stresses the importance of checking manipulations. Whilst the present study endeavoured to exclude participants whose responses could have confounded findings, the questions used were novel. Given that use of the experimental information was related to monitor style it may not be appropriate to use this question in future studies. Future studies could explore the most appropriate methodologies for scrutinising vignette designs and how these participant responses impact on findings.

Part two: Predictors of intentions to attend

Consistent with the MPM, monitoring status was associated with the use of the experimental information in formulating intentions to attend, although contrary to previous studies (Miller, 1996; Roberts, 2000), was not associated with intentions. Several factors could account for this. The information given in the experimental condition gave minimum details and was gain/neutral framed. This could have moderated differences between high and low monitors as evidence suggests that gain framed, with brief content, compared to detailed loss framed ones may not generate significant differences in intentions between high and low monitors (Mann, Sherman, & Updegraff, 2004; Williams et al., 2005). This may be because there is insufficient information for low monitors to engage in information avoidance. Participants in the current study also expressed positive intentions prior to reading the experimental information, hence anchoring opinions prior to reading about the possible outcomes of attending. Monitoring style may have a greater influence on the perception of information when beliefs have not previously been anchored. For example the Belief Adjustment Model (Hogarth & Einhorn, 1992) proposes that in scenarios where individuals engage in step by step decision making, as used in this study, compared to end of sequence decision making, decision outcomes might be different.

Due to the non-parametric nature of the data, it was not appropriate to explore whether monitor style and information order might interact to influence intentions. ANCOVA using monitor status as a covariate would have been the appropriate analysis. Future studies could explore such relationships, as interactions between information coping style and other information presentation manipulations, such as framing effects, have been reported (Miller et al., 1999).

The Health Belief model and information predictors

Findings from Step 1 of each of the regression models suggest it made little difference whether HBM variables were treated as independent predictors or as composite scores to the overall predictive power of the model (28% vs. 25% of variance). However, in the composite score regression (Model 2), benefits less barriers was a significant predictor, which was consistent with Roberts (2000) and Binetti et al., (2005) and offers some support to researchers suggesting that the relationships between HBM variables should be considered (e.g. Sheeran & Abraham, 1996). Findings from the independent HBM regression (Model 1) are consistent with those reported by Werner (2003), as was the finding that cues to action and perceived barriers were significant predictors of intentions. However, when information variables were entered into each regression, the only HBM variable to remain a significant independent predictor was cues to action, and this was in the composite model. These results suggest that information variables were more powerful predictors of intentions than HBM variables. Entering them at step two not only significantly increased the predictive power of the models (ΔR^2 .14 and .15 for Models 1 and 2), but they also affected the predictive value of HBM variables. This finding has a number of theoretical and clinical implications, especially in relation to the utility of the HBM to account for intentions to attend a cognitive screen. Firstly, that cues to action remained the only significant predictor in the HBM after information was entered into the regression models, illustrates the importance of testing this variable in studies using the HBM as a theoretical framework. Few HBM studies test this variable and, in light of the present findings, excluding it could limit the explanatory power of the model. Indeed, the present findings suggest that cues to action have the greatest explanatory power of health intentions within the HBM. Furthermore, the cues to action question used in this study was worded to test the role of perceived social support on screening intentions, and thus the present findings further support the literature stressing the role of social support on health behaviours by older adults, particularly in females (e.g. Rennemark & Hagberg, 1999). In clinical settings, this suggests that clinicians referring individuals for cognitive assessments should explore perceived social support as less perceived support was associated with poorer intentions.

The findings from the regression models also suggest that belief in and use of clinical information are also proximal determinants of screening intentions and should be taken into account in future studies attempting to account for screening behaviours and intentions. In addition, given that belief and use of information influenced screening intentions, these findings also underscore the importance of methodology checks when studying intentions using clinical vignettes as the extent to which participants engaged with the vignettes influenced responses to study questions.

Thus, the present findings suggest that whilst individual HBM variables have some utility, alone, the current HBM might not provide a comprehensive account of the proximal determinants of dementia screening behaviour. Whilst researchers could explore alternative social cognition models, e.g. The Theory of Planned behaviour, (Ajzen, 1991), while also taking into account the influence of clinical information, there are limitations to using social cognition models (SCMs) with dementia screening that are likely to increase as research progresses into using symptomatic samples.

SCMs were developed to account for health behaviours in illnesses where there was an expectation that the health behaviour would result in improved health so that applying them to degenerative, terminal illness is beyond their original scope (Norman & Conner, 1996). Dementia assessments cannot offer curative treatments, and awareness of this, in individuals referred for assessments, could trigger cognitions and emotional sequelae not considered by SCMs that could determine screening behaviour. Indeed, Robinson, Elkman, and Wahlund, (1999) have described an 'existential terror' and a threat to sense of self in individuals who suspect they have dementia. Studies in physical health settings using degenerative, terminal illness scenarios, suggest threats to personal meaning and 'existential health' can determine health behaviour (see e.g. Chochinov et al., 2005; Crowther et al., 2002; Benjamins & Brown, 2004). Thus, future dementia studies could usefully explore existential, spiritual or religiosity frameworks either alone or combined with SCMs.

Secondly, although the HBM has utility for predicting health behaviour in adult and older adult cognitively impaired schizophrenic participants (e.g. Adams & Scott, 2000; Budd, Hughes, & Smith, 1996); SCMs do not take into account neuropsychological determinants of health behaviour. This is problematic as cognitive impairments associated with normal ageing or disease independently predict health behaviour, lessen the likelihood of individuals engaging in rational, analytic decision making and could moderate/mediate the relationships between attitudes, behavioural intentions and actual screening behaviour (Brown & Park, 2003). For example, deficits in working, prospective and retrospective memory negatively impact on engaging in adaptive health behaviour, even when there is an intention (positive attitudes) to do so (e.g. McDonald-Miszczak, Maris, Fitzgibbon &

Ritchie, 2004; Park et al., 2002). Deficits in executive skills, such as anosognosia (.e.g. Smith et al., 1999, Todman, Gordon-Leeds & Taylor, 1997) and dissociations between intentions and behaviour can influence initiating repetitive health behaviours in cognitively impaired populations (e.g. Cuffel, Alford, Fischer, & Owen, 1999; Jeste et al., 2003; Mutsatsa et al., 2003). Hence, future studies of dementia screening behaviour using symptomatic populations could consider neuropsychological variables. For example researchers could explore the utility of the self regulatory model (Leventhal, Nerenz, & Steele, 1984) which takes account of people's cognitive representations (awareness) of symptomatology, e.g. symptomatic vs. asymptomatic, to allow researchers to model the effect of lack of awareness (anosognosia) on decision making. Neuropsychological barrier items could also include tests of executive functioning and memory items such as forgetting to attend.

The present study had a number of limitations. It examined the influence of a limited amount of information, with a small number of participants and did not test how informed participants were following information presentation. It is possible that recall of information was affected by the information manipulation and that differences in recall might explain the findings. The relationship between subjective memory concerns and information was also not tested. An additional difficulty with this type of study is the use of the hypothetical vignettes with an asymptomatic population using intentions as an outcome measure. Although this design is commonly used in dementia research and allows researchers to isolate and test variables of interest in novel and ethically complex areas (Lui & Park, 2004; Mitchie & Broadstock, 2003), it has important shortcomings. Hypothetical scenarios may not generate the emotions and cognitions that actual testing could (Roberts, 2000), which could have influenced responses to the questionnaires. Furthermore, intentions to carry out screening behaviours do not always translate into attendance (Gollwitzer, 1999), thus inflating the degree of variance explained by models (Drossaert, Boer, & Seydel, 2003). Finally, although the study endeavoured to recruit a representative sample, important sub-populations, namely individuals from ethnic minority groups were not recruited and this limits generalising findings.

Conclusions

Imparting information about some of the possible outcomes of a dementia assessment does not impact on the majority of participants' intentions. In the 21% who changed their intentions, participants were more likely to increase intentions, without increasing state anxiety. Order of information effects were modest but tentatively suggest that imparting positive information before negative is associated with increased intentions. Findings support a growing body of research suggesting that cues to action from important others, perceptions of barriers, either alone or as a part of a decision balance (benefits less barriers), and information about assessment outcomes are possible determinants of screening behaviour and that these could inform interventions to promote attending dementia assessments. However, alone, the HBM is unlikely to provide clinicians with a comprehensive framework for understanding dementia screening behaviour.

As well as determining the role of neuropsychological variables on dementia screening behaviour future studies could explore the possible role of cognitions and emotions triggered by the terminal, neurodegenerative nature of dementia. Future research should, ideally, use clinical samples of older adults referred for an assessment for dementia. Collaboration between memory clinics or primary care research networks in GP surgeries with annual screening programmes may allow recruitment of a clinical sample although this would not be without some difficulty. Finally, recall and comprehension of clinical information need to be assessed, when comparing different presentation manipulations and media for imparting clinical information.

In sum, failure to impart information about the possible outcomes of a cognitive assessment not only threatens client autonomy, but also limits a clinician's opportunities to strengthen intentions to attend a cognitive assessment. Imparting information about dementia screening and the possible outcomes of that screening should be explored as one part of interventions aiming to increase attendance.

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List of Appendices

Appendix 1

Age and Ageing

Information for Authors

INSTRUCTIONS TO AUTHORS

Please read and follow these instructions carefully. Manuscripts not meeting all of the requirements outlined below cannot be considered for publication and may be returned to the authors for completion.

Please note the following points before proceeding:

- Submissions to *Age and Ageing* should not have been previously published (except as an abstract, in which case details should be given). Similarly, the article should not be under consideration by another journal.
- Submissions may be modified or shortened by the Editor before acceptance for publication.
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Your submission will need to be considered for a specific section of the journal.

Research Papers: Should include a structured abstract using appropriate headings. A maximum of 2500 words of text, plus abstract, 30 references, 3 tables or figures.

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- Details of any possible **conflicts of interest** (see details below)
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Try to avoid language that might be deemed unacceptable or inappropriate (e.g. 'older people' is preferred to 'the elderly', the word 'senile' is best avoided). Take care with wording that might cause offence to ethnic or cultural groups.

Appendix 2

Table 1: Summary of main social cognition models

Model Name	Authors	Key Features & predictor variables	Predictions of health behaviour
Health Belief Model	Rosenstock, (1974)	Health behaviour is the result of a cost / benefits analysis. The key predictor variables are • Severity / susceptibility • Barriers / benefits • cues to action • self-efficacy	More likely to engage in adaptive health behaviour, if they feel that they are susceptible to the disease, feel that the disease is severe, that the benefits of engaging in the behaviour outweigh the costs, and are exposed to cues to engage in the behaviour
Social Cognitive Theory (Self efficacy)	Bandura, (1986)	Health behaviour is determined by perceptions of self efficacy and expectancies about the outcome of the behaviour. Key predictor variables are •Self efficacy •Situation outcome expectancies (of the behaviour)	More likely to engage in behaviour if one feels that one's own actions can determine specific outcomes.
Theory of Planned Behaviour	Ajzen, (1991)	Health behaviour is the result on an expectancy utility analysis. Key predictors of behaviour are: • Behavioural intentions • Perceived Behavioural Control. These are predicted from • Attitudes / perceived behavioural control / subjective norm	More likely to engage in health behaviour if an individual holds positive attitudes towards the behaviour, perceives the behaviour is within their resources (control), and are influenced by the positive
Protection Motivation Theory	Rogers, (1983)	Health behaviour is a fear reduction process involving an appraisal of threat and coping appraisals. Threat appraisal involve perceptions of • Susceptibility / severity	More likely to engage in adaptive health behaviour if, feel susceptibly and vulnerable to the target problem, feel the behaviour is useful to counter the threat and that one has the ability to carry out the behaviour.

Appendix 3

Table 2 Summary of models often referred to in the social cognition literature as social cognition models

Model	Authors	Key Features & predictor variables	Predictions of health behaviour
Health Locus of Control	Wallston and Wallston, (1981)	Three dimensions of expectancy beliefs of, • Internal Locus of Control • Powerful others Locus of Control • Chance Locus of Control • Predict health behaviours.	More likely to engage in adaptive health behaviour if they have an internal locus of control, and more likely to engage in recommended behaviour if hold strong beliefs about powerful others.
Transtheoretical Model	Prochaska and DiClemente, (1984)	Health behaviour is determined by which stage of change they are undergoing. Stages of change are: • Pre-contemplation, • contemplation, • Preparation (intentional behaviour) • Action / change (starting & committing) • Maintenance (of target behaviour)	Individuals in the pre-contemplation and contemplation stages are less likely to engage in health behaviours compared to those in the preparation and action / change phases.
Health Action Process Approach	Schwarzer & Fuchs, (1996)	Adoption, initiating and carrying out of health behaviours involves a motivational and volition phases (planning, action and maintenance) that influenced by perceptions of self efficacy. Key predictors are • Outcome expectancies • Perceived self-efficacy • Goal intentions • Action plans / Action control • Health action / External barriers and resources	More likely to engage in health behaviour if feel susceptible to developing the target problem, if the target behaviour is likely to reduce the risk, that one is confident about performing the behaviour and is motivated (time for action) to engage in the behaviour.

Appendix 4

Journals Listings
Alphabetical Listing
Journals by Subject
New Journals
Resources
Advertising
Commercial Opportunities
Copyright Transfer FAQs
Customer Services
Email Contents Alerting
eUPDATES
Instructions for Authors
Online Information
Online Sample Copies
Permissions
Press Releases
Price List
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2. Smith, A.P., Tyrrell, D.A.J., Coyle, K.B., Higgins, P.G. and Willman, J.J. (1990) Individual differences in susceptibility to infection and illness following respiratory virus challenge. *Psychology and Health*, **4**, 201-211.

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Appendix 5

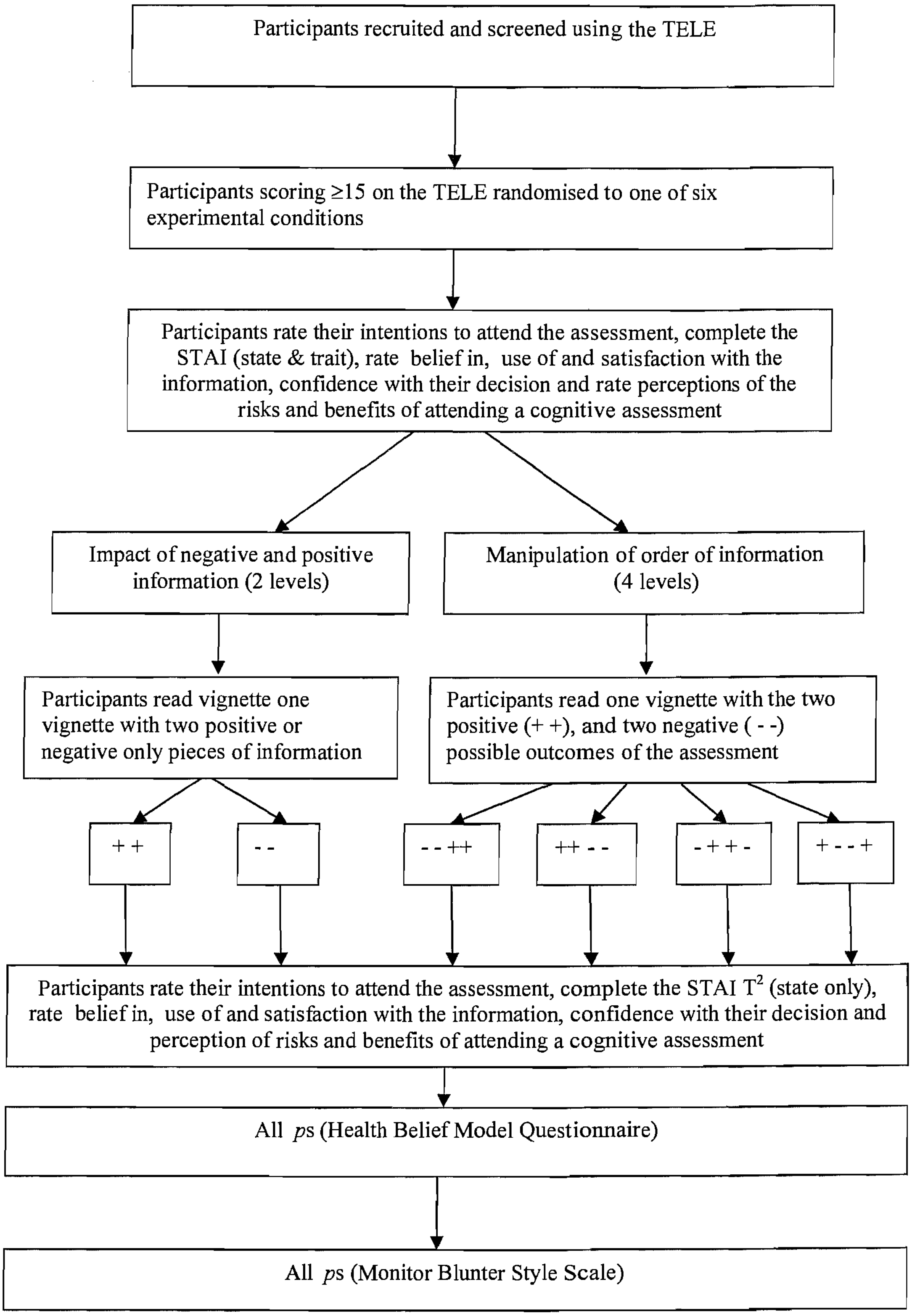

Figure 1: Schematic of the experiment

Appendix 6

Table 3: Mean, range, mode and median ranks for possible positive outcomes of attending an assessment for dementia by participants ($N = 10$)

	Mean	Median	Mode	Range
17. The assessment gives me the opportunity to talk about my difficulties, and not have them dismissed as being down to 'old age'	10.3	9.5	17	3-17
18. The assessment allows me to find out if I do or don't have memory difficulties	6	5	1	1-18
19. The assessment allows me to find out what the causes of my difficulties might be	6.2	4	1, 4, 11†	1-13
20. The assessment gives useful information about what my difficulties are	6.4	4	2	2-15
21. The assessment would help my family to understand the causes of my memory difficulties and this may reduce family stress	9.1	10	3,14†	1-17
22. Following the assessment I may receive medication to slow down the rate of memory decline	5.5	5	1, 2†	1-13
23. The results of the assessment may help me learn skills to help compensate for memory loss	6.6	6	9	2-14
24. The results of the assessment may help me understand exactly what my difficulties are and how they impact on everyday life.	7.8	9	9,10†	1-14
25. The results of the assessment may help me learn skills for managing everyday activities	7.5	7.5	10	1-13
26. The results of the assessment may help me make important decisions about my future treatment	10.1	11	12,14†	3-15
27. The results of the assessment can help me make important decisions about when to stop work	13.9	15	16	6-18
28. The results of the assessment can help me make the best use of the time that I have and put affairs in order while I am still 'capable'	10.9	11	10, 12†	4-18
29. Following the assessment I may be entitled to financial benefits	13.8	14	17	9-17
30. Following the assessment I may be given a diagnosis for my problems	8.6	7	7, 12†	2-16
31. Following the assessment I may be offered therapy if my memory difficulties are due to emotional or mental health difficulties	10.4	11	11,13†	5-17
32. The assessment would help me get access to the most appropriate services and support	12	13	11,16†	7-16
33. The assessment would help me find out what 'cognitive' skills are still intact (my strengths) and this may help me retain a sense of 'self'	9.5	7.5	7	4-16
34. I may find the testing process enjoyable and interesting	16.9	18	18	11-18

Note. † = Multiple modes, all given.

Appendix 7

Table 4: Mean, range, mode and median ranks for possible negative outcomes of attending an assessment for dementia by participants ($N = 10$)

	Mean	Median	Mode	Range
1. The assessment itself may take several sessions, and may be demanding, tiring and anxiety provoking.	10.4	11.5	11	1-17
2. The assessment process may make me feel 'stupid' or a failure', and may provoke memories about feeling that I am back at school, which might be unpleasant	8.9	6.5	2-18†	1-18
3. The results of the assessment are not always conclusive	10.2	10	7, 9, 10†	7-17
4. The results of the assessment may confirm that I have a progressive degenerative disorder (e.g. Alzheimer's Disease)	1.9	1	1	1-6
5. The results of the assessment may identify that it would be dangerous for me to continue driving, and I could be asked to give up driving	7.9	7	2, 4, 10†	2-17
6. The results of the assessment may have negative repercussions for insurance policies	12	10.5	10,16†	5-18
7. Receiving and adjusting to a diagnosis of dementia can be distressing	7.2	4.5	2	2-11
8. If the results of the assessment suggest you have cognitive impairments, this can have a negative impact on my relationships with others	10.1	12	3, 14†	3-17
9. If I perform badly on the tests then it will be harder for me to deny that I have a problem	9.4	6.5	6	5-18
10. I may be faced with knowing my cognitive weaknesses	7.6	8	5,8†	2-14
11. The results of the assessment may impact on my legal status e.g. I may be deemed 'incapable' of managing my financial affairs	13.3	14.5	15	5-18
12. I am concerned about who might be told about the results of the assessment	12.5	13	12, 14†	5-18
13. I am concerned that I might be abandoned by my family / loved ones	9.7	9	8	3-15
14. I am anxious about having to be reassessed later on, and finding that I have declined further	7.9	7.5	6, 9†	1-18
15. The results of the assessment may contribute to the decision that I may not be able to return home and continue to look after myself (e.g. because it may be unsafe)	8.2	7.5	4, 7†	3-14
16. The results of the assessment may exclude you from some forms of treatment, due to concerns that I may not be able to consent to them	12	12	12,16†	6-16
17. The results of the assessment may make recommendations about my ability to care for other family members	8.8	8.5	4,16†	3-16
18. The results of the assessment may make recommendations about my ability to work and carry out my usual social and domestic activities	12.8	18	16	1-18

Note. † = Multiple modes, all given.

Appendix 8

Baseline (dementia symptom vignette)

Recently you have begun to lose items such as your house keys and reading glasses and have been forgetting people's names. These difficulties concern you. You visit your GP and explain your concerns. Your GP recommends that you should attend a formal assessment of your memory and other 'cognitive' (thinking skills). This assessment is called a cognitive assessment. The assessment would be with a clinical psychologist. You arrange to see your GP again the next week.

Experimental vignettes (1-6)

1. Positive Only (PO)

You see your GP again the next week. He / she gives you additional information about the cognitive assessment. He / she tells you that the results of the assessment will allow you to find out if you do or do not have memory difficulties. If the assessment confirms that you have memory difficulties, you may receive medication to slow down the rate of memory decline.

2. Negative Only (NO)

You see your GP again the next week. You see your GP again the next week. He / she gives you additional information about the cognitive assessment. He / she tells you that the results of the assessment may confirm that you have a progressive degenerative disease, e.g. Alzheimer's disease. Receiving and adjusting to a diagnosis of dementia can be distressing

3. Positive Sandwich (PS)

You see your GP again the next week. He / she gives you additional information about the cognitive assessment. He / she tells you that the results of the assessment will allow you to find out if you do or do not have memory difficulties. The results of the assessment may confirm that you have a progressive degenerative disease, e.g. Alzheimer's disease. You are told that receiving and adjusting to a diagnosis of dementia can be distressing. Finally, he / she explains that, if the assessment confirms that you have memory difficulties, you may receive medication to slow down the rate of memory decline.

4. Negative Sandwich (NS)

You see your GP again the next week. He / she gives you additional information about the cognitive assessment. He / she tells you that the results of the assessment may confirm that you have a progressive degenerative disease, e.g. Alzheimer's disease. Hence, the results of the assessment will allow you to find out if you do or do not have memory difficulties. If the assessment confirms that you have memory difficulties, you may receive medication to slow down the rate of memory decline. Finally, he / she explains that receiving and adjusting to a diagnosis of dementia can be distressing.

5. Positive First (PF)

You see your GP again the next week. He / she gives you additional information about the cognitive assessment. He / she tells you that the results of the assessment will allow you to find out if you do or do not have memory difficulties. If the assessment confirms that you have memory difficulties, you may receive medication to slow down the rate of memory decline. The results of the assessment may confirm that you have a progressive degenerative disease, e.g. Alzheimer's disease. Finally, he / she explains that receiving and adjusting to a diagnosis of dementia can be distressing.

6. Negative First (NF)

You see your GP again the next week. He / she gives you additional information about the cognitive assessment. He / she tells you that the results of the assessment may confirm that you have a progressive degenerative disease, e.g. Alzheimer's disease. Receiving and adjusting to a diagnosis of dementia can be distressing. Hence, the results of the assessment will allow you to find out if you do or do not have memory difficulties. Finally, he / she explains that if the assessment confirms that you have memory difficulties, you may receive medication to slow down the rate of memory decline.

Appendix 9

School of Psychology, University of Southampton, Ethics committee letter approving the study.

University
of Southampton

School of Psychology

University of Southampton
Highfield Southampton
SO17 1BJ United Kingdom

Tel +44 (0)23 8059 3995
Fax +44 (0)23 8059 4597

10 June 2004

Deborah Morris
Department of Clinical Psychology
University of Southampton
Highfield
Southampton SO17 1BJ

Dear Deborah,

<u>Re:</u> **The influence of information about possible positive and negative outcomes of a cognitive assessment on intentions of people over the age of 55 to participate in a cognitive assessment**

I am writing to confirm that the above titled ethics application was approved by the School of Psychology Ethical Committee on 6 June 2004.

Should you require any further information, please do not hesitate in contacting me on 023 8059 3995.

Please quote approval reference number CLIN/03/42.

Yours sincerely,

KMLucas

Kathryn Lucas
Secretary to the Ethics Committee

Appendix 10

UNIVERSITY OF SOUTHAMPTON

Doctoral Programme in Clinical Psychology
Building 44 (Shackleton)
Highfield
Southampton
SO17 1BJ

Direct Line:
023 8059 5321/0

Direct Fax:
023 80592588

email:
dm701@soton.ac.uk

Survey about people's intentions to attend an assessment of their memory

About this Research Project
I am Deborah Morris, a Trainee Clinical Psychologist at the University of Southampton. I am asking you to take part in a study looking at how people decide whether to attend an assessment of their memory and other thinking skills (e.g. attention and concentration).

What does the study involve?
The study will be completed over two stages. The first will involve a brief assessment of your memory. This will be completed over the telephone (10 minutes), and will be conducted by me. The second stage will involve completing some questionnaires (about 30 minutes) that will be sent to you through the post, and returning them to a freepost address.

What are the potential benefits or risks to completing the study?
Although you will not personally benefit from this study, we hope that the understanding we gain with your assistance, will help clinicians to better inform their patients about assessments, and the need for undertaking them. We do not anticipate any risks to you in completing the study.

Who will have access to information I give?
If you take part in the study you will be given an anonymous code. The results of this study will not include your name or any other identifying characteristics. Personal information will not be released to anyone other than researchers involved in this project. Your employer, family and friends will not be given access to the questionnaires that you would complete as apart of the study.

Do I have to take part?
You do not have to take part. Taking part is voluntary and you may withdraw from the study at any time. If you decide to participate and change your mind during either of the stages, your wishes will be fully respected and you will not be asked to explain why you have changed your mind.

What do I do if I want to take part?

If you would like more information about the study before deciding whether to take part, please contact either Deborah Morris or Dr. Romola Bucks at the address, telephone number, or email address at the top of this page. If you would like to take part in the study could you please read and complete the informed consent form attached to this letter. Please return the competed, and signed informed consent form to Deborah Morris using the FREEPOST addressed envelope provided. In the event that the envelope has not been provided, or it has been misplaced, please either contact Deborah Morris at 02380-595321 for a replacement, or please return the questionnaires to the following FREEPOST address:-

Clinical Psychology (DM)
Shackleton Building 44
FREEPOST SO286
University of Southampton
Southampton
SO17 1YN

If after completing the study you would like more information about the research, additional information can also be obtained upon request. To request more information, please contact me at the address, telephone number, or email address at the top of this page.

Thank you for taking the time to read this.

Yours Sincerely

Deborah Morris
Clinical Psychologist in Training
Supervised by Dr. Romola Bucks,
Senior Lecturer in Clinical Psychology, University of Southampton

If you decide to participate in the study, please keep this sheet for your information

Appendix 11

UNIVERSITY OF
SOUTHAMPTON

Doctoral Programme in Clinical Psychology
Building 44 (Shackleton)
Highfield
Southampton
SO17 1BJ

Direct Line:
023 8059 5321/0

Direct Fax:
023 80592588

email:
dm701@soton.ac.uk

Consent Form

Title of Project: Survey about people's intentions to attend an assessment of their memory

Researcher: Deborah Morris, Trainee Clinical Psychologist.

Please read the following statements carefully and write your initials the appropriate box

1. I confirm that I have read, and understand the information provided about this study. ☐

2. I understand that I may withdraw my consent to participate in the study at any time without my medical care or legal rights being affected. ☐

3. I understand that data collected as part of this research project will be treated confidentially, and that published results of this research project will maintain my confidentially. ☐

4. I understand that the researcher, Deborah Morris, will telephone me at home, to complete a brief assessment of my memory. ☐

5. My telephone number is: ☐

(Your telephone number will not be shared with anyone else, and will be removed from this form after you have completed the telephone interview or if you choose to withdraw from the study)

The most convenient time and day for Deborah to telephone me is

☐

For the purposes of the study could you please state you date of birth

☐

I agree to take part in the above study. Yes ☐ No ☐

(Please tick Yes or No)

Name *Please print your name in block capitals*	Date	Signature
Researcher	Date	Signature

I understand that if I have questions about my rights as a participant in this research, or if I feel that I have been placed at risk, I can contact the Chair of the Ethics Committee, School of Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: (023) 8059 3995

Participant Code ☐

Appendix 12.

Table 5: Summary of within experimental condition analyses for the impact of the experimental information with dependent variables ($N = 77$)

	T	p
Positive Only		
ITA vs. ITA^2	0.00	1.000
Conf^1 vs. Conf^1	0.00	1.000
R&B^1 vs. R&B^2	-1.00	.317
Sat^1 vs. Sat^2	-1.00	.317
STAI^1 vs. STAI^2	-1.13	.260
Negative Only		
ITA^1 vs. ITA^2	-1.67	.096
Conf^1 vs. Conf^1	0.00	1.000
R&B^1 vs. R&B^2	-0.58	.564
Sat^1 vs. Sat^2	-1.63	.102
STAI^1 vs. STAI^2	0.32	.748
Positive Sandwich		
ITA^1 vs. ITA^2	-1.00	.317
Conf^1 vs. Conf^1	-1.34	.180
R&B^1 vs. R&B^2	-.045	.655
Sat^1 vs. Sat^2	0.00	1.000
STAI^1 vs. STAI^2	-1.08	.281
Negative Sandwich		
ITA^1 vs. ITA^2	-1.13	.257
Conf^1 vs. Conf^1	-0.58	.564
R&B^1 vs. R&B^2	-0.82	.414
Sat^1 vs. Sat^2	-1.73	.083
STAI^1 vs. STAI^2	-1.90	.057
Positive First		
ITA^1 vs. ITA^2	-1.14	.034
Conf^1 vs. Conf^1	-0.58	.564
R&B^1 vs. R&B^2	1.00	.317
Sat^1 vs. Sat^2	-0.45	.655
STAI^1 vs. STAI^2	-1.75	.080
Negative First		
ITA^1 vs. ITA^2	-1.41	.157
Conf^1 vs. Conf^1	-1.00	.317
R&B^1 vs. R&B^2	-1.73	.083
Sat^1 vs. Sat^2	0.00	1.000
STAI^1 vs. STAI^2	-1.28	.201

Note. ITA = intentions to attend; Conf = confidence in decision; R&B = perceptions of risks and benefits of attending; Sat = satisfaction with the assessment information; STAI: state anxiety; ^{1} = Time 1; ^{2} = Time 2; ^{change} = change scores.

Appendix 13

Table 6: Summary of post-hoc comparisons for information order effects with dependent variables change scores (*N* = 77)

Median, Mode, range	*U*	*p*
Positive Only vs. Negative Only		
$\text{ITA}^{\text{change}}$	81.00	.231
$\text{Conf}^{\text{change}}$	104.00	1.000
$\text{R\&B}^{\text{change}}$	90.50	.323
$\text{Sat}^{\text{change}}$	85.50	.276
$\text{STAIs}^{\text{change}}$	84.00	.375
Positive Sandwich vs. Negative Sandwich		
$\text{ITA}^{\text{change}}$	63.00	.487
$\text{Conf}^{\text{change}}$	52.00	.175
$\text{R\&B}^{\text{change}}$	66.00	.653
$\text{Sat}^{\text{change}}$	60.50	.443
$\text{STAIs}^{\text{change}}$	60.00	.502
Positive First vs. Negative First		
$\text{ITA}^{\text{change}}$	35.00	.008
$\text{Conf}^{\text{change}}$	61.00	.328
$\text{R\&B}^{\text{change}}$	49.50	.045
$\text{Sat}^{\text{change}}$	64.00	.603
$\text{STAIs}^{\text{change}}$	68.50	.839

Note. ITA = intentions to attend; Conf = confidence in decision; R&B = perceptions of risks and benefits of attending; Sat = satisfaction with the assessment information; STAI: state anxiety; ^{1} = Time 1; ^{2} = Time 2; $^{\text{change}}$ = change scores; Alpha with Bonferroni correction = .015.

Appendix 14

Table 7: Dependent variable rating at baseline (T^{1}) and after experimental condition (T^{2}; T$^{\text{change}}$) by demographic variables (*N* = 77)

	χ^2	df	*p*
Gender (M:F)			
ITA^{1}	1.86	5	.834
ITA^{2}	0.80	2	.881
ITA$^{\text{change}}$	6.5	4	.115
Conf^{1}	3.8	2	.125
Conf^{2}	0.71	2	.827
Conf$^{\text{change}}$	3.8	2	.150
R&B^{1}	0.36	2	.930
R&B^{2}	1.0	2	.769
R&B$^{\text{change}}$	3.12	3	.390
Sat^{1}	1.54	4	.912
Sat^{2}	0.63	3	.965
Sat$^{\text{change}}$	2.58	4	.122
STAIs^{1}	21.37	23	.559
STAIs^{2}	17.66	23	.872
STAIs$^{\text{change}}$	17.81	18	.409
Family history of dementia (Y:N)			
ITA^{1}	3.24	4	.490
ITA^{2}	4.69	2	.082
ITA$^{\text{change}}$	3.22	4	.546
Conf^{1}	0.55	2	.893
Conf^{2}	1.55	2	.476
Conf$^{\text{change}}$	0.86	2	.684
R&B^{1}	1.97	2	.326
R&B^{2}	0.48	2	.100
R&B$^{\text{change}}$	2.60	3	.481
Sat^{1}	6.73	4	.118
Sat^{2}	0.87	3	.914
Sat$^{\text{change}}$	0.39	3	.451
STAIs^{1}	20.45	23	.604
STAIs^{2}	19.15	23	.721
STAIs$^{\text{change}}$	13.42	18	.802

Note. M = Male; F = Female; Y = Yes; N = No; ITA = intentions to attend; Conf = confidence in decision; R&B= perceptions of risks and benefits of attending; Sat = satisfaction with the assessment information; STAI: state anxiety; ^{1} = Time 1; ^{2} = Time 2; $^{\text{change}}$ = change scores.

Appendix 15

Table 8: correlations between demographic variables and dependent variables at baseline and after the experimental manipulation (*N* =77)

	1	2	3	4	5	6	7	8	9	10	11	12
1. TELE Total												
2. Age	.45											
3. Years of Education	.25†	.06										
4. Intentions (Time^1)	.03	.07	.06									
5. STAI (Time^1)	.10	- .21	-.18	-.04								
6. Confidence in decision (Time^1)	-.02	-.14	.03	.41‡	.03							
7. Satisfaction with information (Time^1)	-.20	.04	-.16	.23†	.20	.20						
8. Perception of risks & benefits (Time^1)	-.16	.04	.02	.45‡	.44‡	.43‡	.44‡					
9. Intentions (Time^2)	.05	.06	.17	.60‡	.36‡	.36‡	.26†	.52‡				
10. STAI (state^2)	.09	-.16	-.17	-.02	-.01	-.01	-.04	-.04	.84‡			
11. Confidence in decision (Time^2)	-.01	.21	.05	.40‡	.59‡	.59‡	.20	.51‡	-.15	-.17		
12. Satisfaction with the information about the cognitive assessment (Time^2)	.05	-.02	-.05	.26†	.25	.25†	.62‡	.32‡	-.22	-.22	.29‡	
13. Perception of risks & benefits (Time^2)	-.07	.09	.09	.39‡	.44‡	.44‡	.22	.68‡	-.05	-.08	.51	.37‡

Note. TELE – telephone interview for dementia; STAI- State Trait Anxiety Inventory – State subscale inventory score; †$p < .05$; ‡$p < .01$;

Appendix 16

Table 9: Summary of Chi square analyses for MBSS Monitor style (hi/low) with all dependent variables, at baseline and after the experimental condition (*N* = 110)

Dependent variable	Monitor style			
	N	χ^2	*df*	*p*
Intentions to attend (ITA)				
ITA^1	112	4.36	4	.368
ITA^2	112	5.89	3	.081
ITA^{change}	112	5.20	5	.380
Confidence in decision (Conf)				
$Conf^1$	112	4.46	4	.357
$Conf^2$	112	2.95	4	.598
$Conf^{change}$	112	2.33	4	.859
Satisfaction with information (Sat)				
Sat^1	110	3.86	4	.423
Sat^2	110	1.31	3	.771
Sat^{change}	110	4.11	4	.556
Risk & Benefits (R&B)				
$R\&B^1$	110	6.81	4	.090
$R\&B^2$	110	4.27	3	.173
$R\&B^{change}$	110	1.97	4	.835
STAI (state) (STAIs)				
$STAIs^1$	110	31.91	27	.129
$STAIs^2$	110	23.76	27	.681
$STAIs^{change}$	110	22.28	20	.242
Use of Information				
Baseline	110	0.27	4	.680
Experimental condition	110	14.05	4	.004
Belief in vignette information				
Baseline	112	2.96	4	.576
Experimental condition	112	6.75	4	.122

Note: MBSS = Monitor Blunter Style Scale (Miller, 1987); ITA = intentions to attend; Conf = confidence in decision; R&B= perceptions of risks and benefits of attending; Sat = satisfaction with the assessment information; STAI: state anxiety; ^{1} = Time 1; ^{2} = Time 2; ^{change} = change scores; Alpha with Bonferroni correction = .007.