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Starfished in the Sand: Developing the Theory of Planned Behaviour to Predict Intentions to Use Sunscreen on the Beach.

A research project presented in partial fulfilment for the requirements of the degree of Master of Arts in Psychology at Massey University, Albany, Auckland, New Zealand.

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2003

Abstract

This study examined the predictive power of the theory of planned behaviour in explaining sunscreen use intentions among beach-goers in New Zealand (n = 148) and the United Kingdom (n = 280). Generally, the theory of planned behaviour performed well with attitudes, subjective norms and perceived behavioural control explaining 54.8% (NZ) and 39.5% (UK) of the variability in intention. In addition to the theory of planned behaviour constructs, several other variables were included to enhance the models predictive power. The concepts of descriptive norm, implementation intentions, outcome expectancy, anticipated regret, past behaviour, global self-esteem and conscientiousness were investigated. Implementation intentions, past behaviour and anticipated regret contributed significantly to the theory of planned behaviour in predicting sunscreen use intentions. In addition, partial mediation of the theory of planned behaviour constructs was found by implementation intentions. Interaction effects were evident between past behaviour and perceived behavioural control in the UK sample. Implications for further investigation of the concept of anticipated regret and including a measure of self-identity are discussed.

Acknowledgements

My supervisor, Dr Christine Stephens, has offered a colossal amount of continuous e-mail support and patience over the last year. Undertaking my thesis extramurally away from campus has been a challenge, but with Chris's prompt and directive assistance it has proved rewarding.

Thank you to Professor Charles Abraham at the University of Sussex in the United Kingdom, whom without, the project would have not existed. To Marta Leetes, Sussex University Masters student, whose e-mails were both supportive and showed light at the end of the tunnel. Thank you also Marta for your hospitality around the 'research field' - on the beach at Brighton.

To Katharine Mills, my research partner, that travelled up to the Bay of Plenty for assistance with data collection making the task less difficult, good luck with your thesis and your work in America.

Special mention must be made of my father whose support; both financial and emotional has been unfaltering. His interest in, and enthusiasm for my work has continuously instilled confidence in me. To my mother, although far away, thank you for your contact, financial relief and love.

I am lucky to have the friendship of Kathryn Cochet, Casey Hargreaves and Shiree Blackwell, who have been always been available for advice, editing and brilliant methods of stress alleviation. Wayne Blackburn is a fellow Tauranga student who has provided outstanding extra-curricular help and wise counsel; I look forward to working with him in the future. Thanks and best wishes to Jean Dominy and Julie Sargisson of the Tauranga Master of Arts Support Group.

I am utterly indebted to Ray Webber who has provided tolerance, time, faith and good humour always. His understanding has strengthened my endeavours, with "life after thesis" to look forward to.

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1 SKIN CANCER, SUN TANNING AND SUN PROTECTION

1.1 Melanoma

Melanoma is the most serious of three forms of skin cancer, basal cell carcinoma, squamous cell carcinoma, and melanoma. Melanoma begins as a mole on the surface of the skin where the melanocyte cells, which are responsible for producing the skins pigment, cluster with surrounding tissue (Schering-Plough, 2002). When a melanoma first appears, it is called a cutaneous melanoma. When it spreads to other parts of the body through the bloodstream and the lymph nodes, it is called metastatic melanoma. Melanoma can also be found in the eye (ocular or intraocular melanoma), in the digestive system, in the meninges or in the lymph nodes (Schering-Plough, 2002). Melanoma, like most cancers can be treated in its early stages, but it can also be fatal (Schering-Plough, 2002).

The main factors that contribute to a person being at greater risk of developing a malignant melanoma are genetic or environmental, but over the later stages of the last century further factors have intensified as contributors, these include the increased popularity of sunbathing, changes in clothing styles and depletion in stratospheric ozone levels, (Boyle, et. al., 1995). There is convincing evidence that both excessive sun exposure and episodes of sunburn cause skin damage and skin cancer, namely melanoma (Armstrong & Kricker, 1987). Sunburn is a reddening of the skin, which may last for a number of days, and might also cause blistering of the skin in severe cases (Turkington, 1999). Past occurrences of sunburn are positively related to risk of developing melanoma, but could be a result of individual susceptibility and/or intermittent exposure (Boyle, Maisonneuve and Dore, 1995). Thus, higher risk of melanoma cancer can be directly attributed to an individual's sun-related behaviour (Eiser, 1999). Melia and Bulman (1995) have found that sunbathing was the most frequent behaviour associated with severe episodes of sunburn. Most skin cancer can be avoided (Melia & Bulman, 1995), by staying away from the sun and its harmful ultraviolet rays between the hours of 11 am and 3 pm, by using protective clothing and by applying sunscreen.

1.2 Worldwide Trends

The rates of malignant melanoma are increasing rapidly in fair-skinned populations all over the globe - 92,000 cases were diagnosed in 1985 and the rate of reported incidences double every decade (Boyle, et. al. 1995). In 1995, incidence rates of melanoma in Britain reached about 10 per 10,000 per year. In Canada incidence rates have been tripling, and in America, the rate has increased by 20-40% among Caucasian populations every year (Boyle, et. al., 1995). Queensland State in Australia tops the rate of incidences of melanoma, around 40 per 100,000 per year (Boyle, et. al., 1995). The Melanoma Research Foundation in California (2002) reports that one person every hour dies from melanoma in America. Incidence of mortality from malignant melanoma in Japan has been relatively low, but has been increasing (Boyle, et. al., 1995). Melanoma featured fourth on the list of most frequently diagnosed cancers for men, and third for women in South Australia in the year 1997 (Kirke & Roder, 2000). It is the most common cause of cancer among 35-44 year old males in the United States (Boyle, et. al., 1995).

Increases in rates of incidence for melanoma have been higher than those of mortality. Generally, melanoma is as common in women, where melanoma's are usually found on the legs, as in men, where lesions are more often found on the face and back (Boyle, et. al., 1995). The frequency of cancerous growths found on the body area's that are ordinarily covered is much lower than on the aforementioned exposed sites (Boyle, et. al., 1995).

People who work inside have been found to be at a greater risk of melanoma (Beral & Robinson, 1981) because they are usually exposed to the sun for short periods such as when on holiday to hotter climates. This statistic could be ascribed to more people working indoors at office jobs in recent decades as opposed to labouring out of doors, as was more common earlier last century (Beral & Robinson, 1981). In Britain, there is a higher melanoma incidence rate among higher social classes (Boyle, et. al., 1995) perhaps a factor of professional-indoor type occupations evident in this population.

1.3 Trends in New Zealand

Ozone depletion leads to increases in ultraviolet radiation at the Earths surface (McKenzie, 1996). New Zealand has a comparatively high level of UV radiation when

compared to other countries because the closest Earth-sun separation occurs during the Southern Hemisphere summer (McKenzie, 1996). New Zealand has experienced substantial decreases in summer ozone levels in the last five years (McKenzie, et al. 1999) and this ozone depletion has led to a higher level of UV radiation (that responsible for sunburning) than countries in Europe (McKenzie & Connor, 1999). The UV radiation in New Zealand has increased by about 6-9% from the 1970s to the late 1990s (McKenzie, 1996). When comparing New Zealand's latitude with areas in Australia on the same latitude, New Zealand has about 50% more reported incidences of melanoma (Bulliard & Cox, 1996). The resultant increase in UV radiation from ozone depletion over New Zealand may play a role in the higher rates of skin cancer experienced (McKenzie & Conner, 1999). If ozone levels are depleted by just 1%, it corresponds to nearly a 3% increase in non-melanoma type skin cancers (McKenzie & Connor, 1999).

1.4 Melanoma in New Zealand

New Zealand has the highest rate of mortality from melanoma and second highest (next to Australia) incidence rate in the world (Levi, Lucchini & La Vecchia, 1994) and in 1995 had one of the highest annual average increases (7%) in the world (Boyle, et. al., 1995). Mortality rates for males were 6.5/100,000 (Levi, et. al, 1996).

In the 1998 Registry of Cancer, melanoma was identified as the third most common cancer among females and fourth amongst males. Bulliard and Cox (1996) highlight that there has been a levelling off of reported incidences of melanoma from the 1980s onward. It is unclear whether this is a direct result of fewer cases or because of under-reporting. The Cancer Registry Act introduced in 1993 resulted in better reporting and may explain this trend. Cases from 1995 onward may not be comparable with earlier years. The incidence rate reported on the Cancer Registry can also be influenced by several social factors like number of spot-check health centres available to the public or a reduction in support of registration by certain groups of pathologists (Bulliard & Cox, 1996). Mortality from melanoma has been quite low in comparison to registrations. Deaths in 1998 were 143 for males and 105 for males, with both sexes experiencing an increase in mortality from 1989 onward.

1.5 Sunscreens

Complete avoidance of the suns harmful rays is almost impossible, however there are various sun-protective behaviours that can be adopted to avoid sunburn and skin cancer. Several studies have investigated the use of sunscreen with a sun protection factor (SPF) of 15 or higher as one method of protection. One study found individuals (over the age of 40 years) showed fewer skin lesions over the period of one summer if they had used a sunscreen with factor 17 or higher (Thompson, Jolley & Marks, 1993). In addition Stern, Weinstein & Baker (1986) found that children and adolescents who used sunscreen on a regular basis could dramatically (78%) reduce their lifetime incidence rate of basal and squamous cell carcinomas.

Sunscreen of protection factor 15 provides 15 times more protection than no sunscreen at all, i.e. if it takes 10 minutes in the sun to be burned, SPF15 will protect for 150 minutes (Standards New Zealand, 1998). Sunscreens need regular re-application, and the SPF factor must not be taken as an indication to stay in the sun for longer periods (Kirke & Wilson, 2000). Sunscreen should also be used with other forms of sun protective behaviour like wearing light clothing or seeking shade. In South Australia, studies have found that in general, people do not thoroughly understand the meaning of sunscreen protection factors (Kirke & Wilson, 2000). The use of sunscreens, while important, is shrouded by controversy because while protecting from the harmful rays of the sun it may actually encourage people to spend more time in the sun (McGregor, & Young, 1996). It follows that the promotion of sunscreen could involve education about sun protection factors.

1.6 Worldwide Sun Behaviour and Sun Protection Campaigns

In countries where the population is predominantly fair skinned, numerous sun protection promotional campaigns have been implemented to try and reduce the rates of skin cancer. However campaign effectiveness has come into question because of continuing rising trends in skin cancer (Everitt & Colditz, 1997). In a review of skin cancer prevention, Everitt and Colditz, (1997) outline several factors that are necessary in the execution of successful sun protection promotional campaigns: education about the risks of excessive exposure to the sun, methods to reduce these risks, education of parents on how to set examples for their children, including sun protection education in

school curriculum's, altering fashionable perceptions that a tan is more healthy and attractive, educating also the non-white populations, and increasing awareness of the need to reduce harmful substances that result in the depletion of the ozone layer. It is essential that any melanoma prevention promotion campaign must have appropriate medical backing and advice to ensure up-to-date knowledge of features of malignant melanoma and subsequent treatment (MacKie, 1995).

A number of studies have examined target risk groups, like outdoor workers, patrons at swimming pools and prior skin cancer sufferers. Results of campaigns with these target groups, where programmes are usually focused on single a strategy, tend to vary from programmes designed for the general population where there are multiple strategies and multi media used (Morris & Elwood, 1996). Campaigns targeting large community groups generally use several intervention strategies to change behaviour, whereas campaigns for exclusive groups usually have one intervention designed especially for that group (Morris & Elwood, 1996). Studies on particular groups like outdoor workers have used intervention methods like skin screening and video education to improve sun protective behaviours (Girgis, Sanson-Fisher & Watson, 1994). However, in general, these studies needed improvement in methodological issues like sample size, assessment methods and follow-up measurement (Morris & Elwood, 1996).

In the United Kingdom, the Health Education Authority presented a cancer prevention programme called 'Are you dying to get a suntan?' and later, 'Sun know how' that were designed to in increase the wider publics knowledge about the dangers of the sun and increase sun protective behaviour. However, after implementation of these campaigns most of the respondents surveyed still thought that intermittent exposure, for example while on holiday was okay and that getting skin cancer was relatively unlikely and rare Howard (1995).

Some research has investigated sun behaviour and related cognitions without the use of an intervention. These studies seek to explore factors involved in decision-making processes of an individual that are related to sun-seeking and sun-protective behaviours. For example, Everitt and Colditz (1997) in a study carried out in New Jersey in 1994 found that 15% of beachgoer's found using sunscreen "uncool", only 45% used sunscreen regularly, just over one third of this percentage applied SPF or higher, and

only 54 % applied sunscreens on all exposed areas of the body. The general consensus found in this study was that among those surveyed using sunscreen was socially unappealing.

Furthermore, the Cancer Forum reported in 2000 that in Queensland Australia, one half of respondents surveyed did not use sunscreen when out in the sun in the summertime. It was found, conversely that people who did not meet guidelines for sun protection, perceived themselves as being in control of their health, as being adaptable, and able to take care of themselves (Centre for Health Promotion and cancer Prevention Research, 2000). The study suggested that further promotional campaigns should focus on more abstract concepts, like self-identity in order to be more effective (CHPCPR, 2000).

1.7 Sun Behaviour in New Zealand

High UV levels, and a predominantly outdoor lifestyle are all factors that may contribute to New Zealand's high melanoma incidence rate (McKenzie, 1996; Richards, McGee & Knight., 2001). While attitudes about how much time to spend in the sun have remained fairly stable over the past decade, the New Zealand public's attitude toward using sunscreen as protection from the sun has begun, more recently to change (McKenzie, 1996; Richards, et al., 2001). In a study by the Cancer Society in 1994, 34% of people indicated they used sunscreen the previous weekend, and in replicated research in 1997 and 2000, this had increased to 36% and 39%, respectively (NFO, CM Research, 2000). These studies also identified prevention of sunburn as the primary reason for wearing sunscreen. Reasons given for not wearing sunscreen were; poor weather conditions, sunscreen unnecessary for type of skin, and forgetting (NFO, 2000).

Somewhat surprising results from the NFO (2000) study show that more people think that having a tan aids in protection against skin cancer, and that the family members of the respondents think that sun-tanning is acceptable. One other notable feature of this study is that skin type and perceptions of susceptibility to sunburn seem to play a role in sun protective behaviour and attitudes (NFO, 2000). People with medium or olive coloured skin report more often (as opposed to less often) that they like tanning, and are more likely to apply sunscreen later, i.e. after they have spent time in the sun without sunscreen (NCO, 2000).

Overall in 1997, in excess of 50% more New Zealander's reported sunburn the previous weekend than in 1994, (Bulliard & Cox, 1999). Conversely, in surveys carried out by the Department of Preventive and Social Medicine at the University of Otago in 1994 and 1997, it was found that incidences of sunburn were lower in 1997 than in 1994, but this survey was used among people who were partaking in organised sport (Bulliard & Cox, 1999). Conclusions drawn from theses studies were reached after taking into account differing weather conditions between the two years, which resulted in differing ground UV levels (Bulliard & Cox, 1999).

Most of the research on sun protective behaviours in New Zealand has centred behaviour of children, with some studies being performed with adolescents; it follows that there is a need for further research on adult sun protective behaviour. The focus on children and adolescents has likely been more intensive because it is estimated that instances of sunburn before the age of 15 can considerably increase the risk of developing melanoma or skin cancer later in life (Armstrong & Kricker, 1993).

1.8 New Zealand Promotional Campaigns

Two key advertising campaigns about sun protection; the 1992 Australian 'Slip, Slop, Slap' campaign which also ran in New Zealand, and the Cancer Society's 1992 'SunSmart' campaign have featured during the past eight years (Morris & Elwood, 1996). Following these campaigns, surveys in Melbourne indicated that the most commonly reported method of sun protective behaviour was sunscreen use at 85%, this is over and above use of hats, shirts, and shade, or avoidance of the sun around midday (Morris & Elwood, 1996). Those who identified themselves as unlikely to burn easily reported less often that they used sun protection methods. Morris and Elwood (1996) report that these two campaigns showed encouraging changes in sun protective behaviours over the early 1990s.

Research by the NCO (2000) has shown that recollection of information from these campaigns was high in 1994 (76%) and 1997 (77%) when the campaigns were broadcasting. However since 1997 there has been virtually nil on screen advertising and subsequently a drop in information recollection, 56% for 2000 (NFO, 2000). The most

important features the 1250 people surveyed learned from the promotional campaigns were to wear sunscreen, be careful of the sun and to be an aware of the possible health risks from excessive sun exposure (NFO, 2000).

Richards et.al (2001) found little change in attitudes and sun protection behaviour among New Zealand adolescents from 1991-1997. The reasons suggested for this lack of change, were that the promotional campaigns specifically targeted young children and concentrated on increasing protection behaviour rather than changing cognitions. Richards, et.al (2001) point out that emphasising the reasons why sun protection should be used (i.e. to prevent skin cancer) may be a more effective strategy in changing sunscreen behaviour among adolescents.

In 1996, Morris and Elwood reported that while there have been successful promotional campaigns to promote prevention of melanoma, they have only centred on methods to increase knowledge and change attitudes, without clearly linking them to changing the associated sun behaviour. In review of pre-intervention and post-intervention strategies employed by sun-exposure intervention programmes, Morris and Elwood (1996) highlight the need for changes for both the short term and the long term, and more consistent definitions of sun exposure and behaviour to aid more efficacious comparisons between studies.

In summary, a high rate of melanoma around the world, and in particular New Zealand, is cause of concern. While there has been some success with sun protection campaigns globally, research has indicated gaps in effectiveness. Because of the outdoor lifestyle of most New Zealanders, sunscreen would appear to be the most practical method of sun protection. It follows that sun protection campaigns in New Zealand could benefit from focusing on the promotion of sunscreen. In order to successfully do this factors like cognitions, motivations and personality variables that contribute to New Zealanders sun related behaviours should be explored.

2 PREDICTING SUN BEHAVIOUR

2.1 Social Cognition Models

Social cognition models have been developed to facilitate behaviours that are beneficial to the health, among societies where individuals often adopt behaviours that compromise their health (Norman & Conner, 1995). Social cognition models have been applied in various areas of health psychology to predict health-related behaviour and provide a basis for designing interventions that will effectively change behaviour (Abraham, 1999). Areas in health psychology where social cognition models have been applied include promotion of condom use and safer sex practices, exercise promotion, anti-smoking, drug and alcohol campaigns, promotion of healthy eating, promotion of regular medical check-ups and promotion of sunscreen. The overall goal of interventions applied to health defeating behaviours is to improve the health and lifestyle of the individual as well as the population (Norman & Conner, 1995). Social cognitions can be defined as how an individual's thoughts (or cognitions) come together to make sense of social situations (Norman & Conner, 1995).

Social cognition models are cognitive in the sense that they examine individuals underlying information processing and representation systems of the self, others and the environment (Abraham, 1999). Researchers who examine these internal 'maps' look at how they shape a persons behaviour and at how they differ from person to person (Abraham, 1999). Social cognition models examine differences in individuals' self-reported cognitions with regard to their performance of specific behaviours (Abraham & Sheeran, 2000).

The social component of social cognition models refers to how people are categorized in terms of socially shared constructions of action and decision-making (Abraham, 1999). Social cognition models are social because they include a persons beliefs about what other people are doing and what other peoples thoughts are on a specific behaviour (Abraham, 1999). These perceptions of what others are thinking and doing have an impact on the individuals own thoughts and behaviour.

Social cognition models are based on theories of health behaviour, which contribute to an understanding of how cognitions and social factors play a part in health and disease

(Bandura, 2000). Among the social cognition models are the Health Belief Model (Becker, 1974; Rosenstock, 1974), Social Cognitive Theory (Bandura, 1986), Theory Of Reasoned Action (Ajzen & Fishbein, 1980), Theory Of Planned Behaviour (Ajzen, 1985) and Protection Motivation Theory (Rogers, 1983).

Successful health promotion can be achieved by gaining an understanding of an individual's cognitions thorough the use of reliable self-report measurement in the form of questionnaires or surveys (Abraham & Sheeran, 2000). In order to target intervention effectively, successful prediction of the target behaviour from a variety of variables is necessary. This also allows for a deeper understanding of the behaviour. Factors that affect health behaviour include demographic, social, emotional, personality, self-esteem and cognitive variables (Abraham & Sheeran, 2000. Further contributors are a persons attitude, perceptions and knowledge about the target behaviour. Measurement of the variables includes question items designed to measure the specific cognition, emotion, personality or demographic variable.

The cognitions selected to predict the target health-related behaviour should be based on empirically validated research, which has identified salient beliefs of the population about the behaviour (Ajzen & Fishbein, 1980). Social cognition models should be used with specific populations and Ajzen and Fishbein (1980) point out that they have a propensity to work better with specific populations because of basic social or cultural differences between groups. For example: men versus women, older versus younger people, or New Zealand culture versus Spanish culture. While social cognition models change individual's thoughts and behaviour, in the long-term the impact is on the wider social group (Abraham, 1999). For example: changing one persons view about using sunscreen and by making sunscreen more easily accessible can lead to a change in the societies thoughts on sunscreen being acceptable and therefore if it is acceptable to society, it is acceptable to the individual.

2.2 Utility In Predicting Health Behaviour

Social cognition models have been developed to explain the important cognitions involved with health-related behaviour and how these cognitions may relate to other

variables in predicting health behaviour. The justification for the efficacy of social cognition models is that cognitions, as determinants of behaviour, can mediate other factors involved e.g., demographics, and also these cognitions are more easily changeable than other factors e.g., sex, personality type (Norman & Conner, 1995).

The factors described previously have all been successfully used to predict health-related behaviour. Demographic variables like age, sex and socieo-economic status have been correlated with performance and non-performance of health-related behaviours (Norman & Conner, 1995). Social factors, such as parental and peer influences, culture, personality and self-esteem have been found to be associated with the practice of health behaviours (Norman & Conner, 1995). Cognitive factors also influence the likelihood of health behaviour. Knowledge, perceived risk of the health-related behaviour, control over performance of the behaviour and social pressures can all influence whether or not an individual performs the target behaviour (Norman & Conner, 1995).

In past research, criticisms have been made about the reliability of using a questionnaire approach to measuring internal cognitions to predict behavioural intentions and behaviour. Previous research has included examination of the differences between structured questionnaires, where items measuring specific cognitions were presented together, and randomly presented questionnaires, where the items measuring specific constructs were scattered at different points in the questionnaire. For example, using the theory of reasoned action Budd (1987) found that structured questionnaires, delivered stronger correlations between constructs than randomly assembled questionnaires that also gave weaker internal reliability coefficients. Furthermore, Sheeran and Orbell (1996) in studies using protection motivation theory found differences in internal reliability and strength and significance of inter-correlations when various questionnaire formats were used.

2.3 Theory of Planned Behaviour

The theory of planned behaviour (Ajzen, 1988) is one type of social cognition model and is an extension of Fishbein and Ajzen's (1975) social cognitive model, the theory of

reasoned action. The theory of reasoned action describes that a persons beliefs about societal norms coupled with their attitudes toward a behaviour lead to the formation of intentions that are the cognitive antecedents to the resulting behaviour (Abraham & Sheeran, 2000).

The theory of planned behaviour builds on the concepts of the theory of reasoned action by adding the concept of perceived behavioural control. Perceived behavioural control is how much control a person thinks they have over whether or not they can successfully perform a particular behaviour (Ajzen, 1988). Ajzen and Fishbein (1975) emphasise that in the prediction of a particular behaviour, cognitions should relate to the time, context and action toward the target behaviour. Together attitudes, subjective norms and perceived behavioural control predict intentions to perform a given behaviour. Norman and Conner (1995) outline that the theory of planned behaviour assesses how a person's decision to carry out a particular behaviour is influenced by various beliefs and cognitions. Strong intentions will be formed when there are strong attitudes, subjective norms and perceived behavioural control (Abraham, 1999).

Both the theory of reasoned action and the theory of planned behaviour, dictate that intention is the principal determinant of behavioural performance (Norman & Conner, 1995). The theory of reasoned action is used with volitional behaviours or behaviours over which the individual has a reasonable amount of control, the theory of planned behaviour is useful when the individual may not have good control over the target behaviour, Sheeran, Trafimow, Finlay & Norman, 2002).

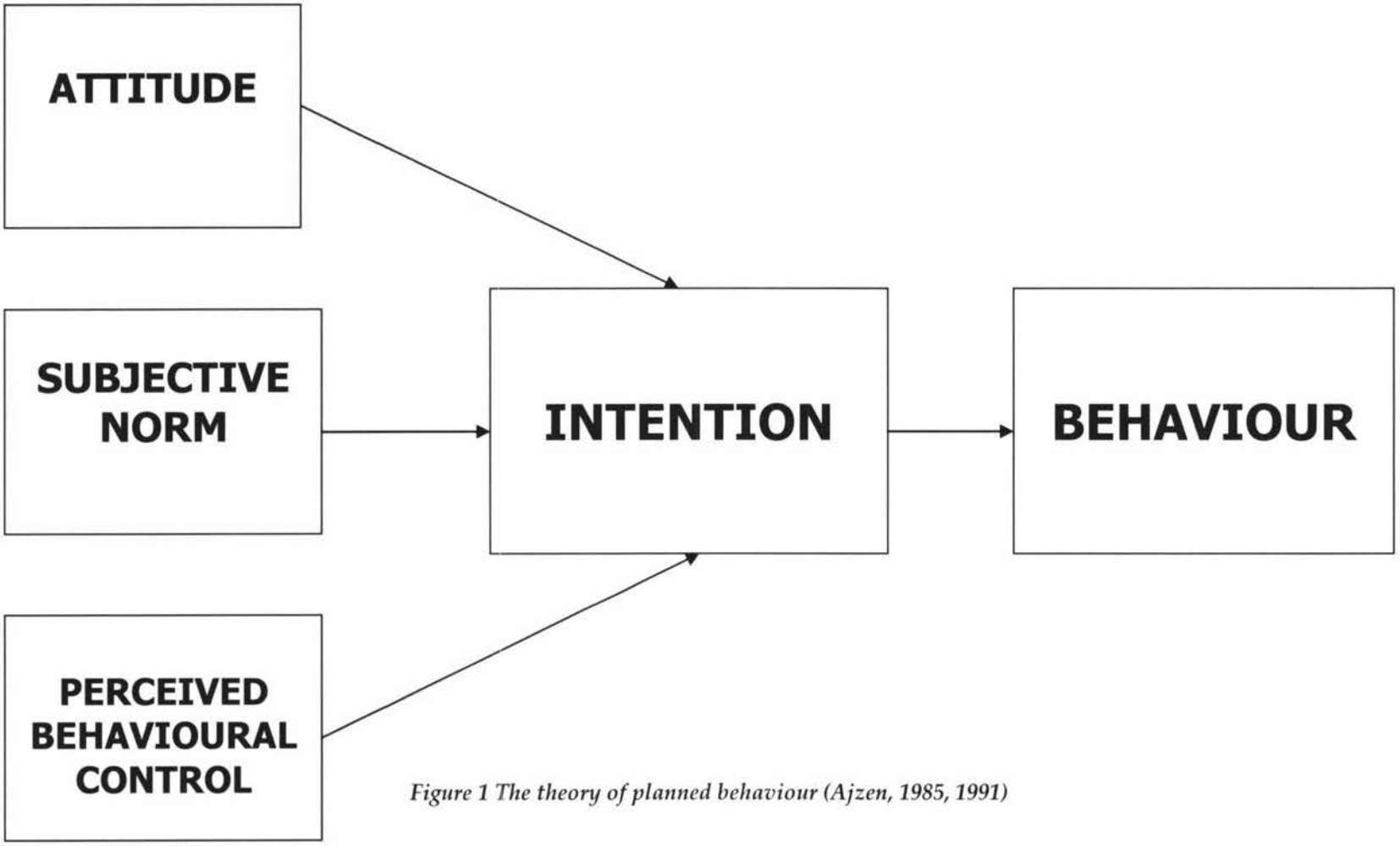


Figure 1 The theory of planned behaviour (Ajzen, 1985, 1991)

2.3.1 Attitudes

The term "attitude" is often defined in terms of the constructs within a particular theory to which it is related. Fishbein and Ajzen (1975) define attitude within the domain of health psychology as:

> "A learned predisposition to respond in a consistently favourable or unfavourable manner with respect to a given object".

To respond consistently refers to the pattern of response consistency, where a person responds to a certain stimulus or object in the same manner at each presentation; the degree of consistency (same side of dimension – generally favourable, generally unfavourable); and evaluative consistency over time (different occasions, different behaviours, same object) (Fishbein & Ajzen, 1975). An attitude is an overall evaluation of the target behaviour by an individual (Ajzen, 2002). Attitudes are made up of beliefs about the outcome of a specific behaviour: how likely it is that the expected outcome will eventuate as a result of the behaviour, and an evaluation of that outcome (Norman & Conner, 1995).

An attitude is an underlying principle that directs a person's behaviour (Fishbein & Ajzen, 1975) and from this one can infer that attitudes can predict a person's behaviour. A discrepancy occurs however, when attitude about a particular behaviour is inferred from the concept of evaluative consistency, but only assumed as a predisposition. Fishbein and Ajzen (1975) stress that to attain a comprehensive description of the term attitude, the affective, cognitive and behavioural components must all be measured, not merely the cognitive component. The affective component of attitude consists of the emotions a person experiences in relation to the object of the attitude, the cognitive component relates to the thoughts or beliefs about the attitude object, and the conative component, which is made up of the explicit actions toward the object of the attitude (Stroebe & Stroebe, 1995). Evaluation may be positive or negative (Stroebe & Stroebe, 1995).

Attitudes are learned mostly from past experiences and when an individual is contemplating a given behaviour they may consider past experience in their decisions

about how to act (Fishbein and Ajzen (1975).

Attitude is evaluative or affective in nature and is distinguishable from other concepts like beliefs, intentions and behaviour. Beliefs refer to the information one has about and object and its link to a specific attribute (Stroebe & Stroebe, 1995). Beliefs are related to attitudes because attitudes are formed as a function of the characteristics of the attitude object, a person's evaluation of these characteristics and also a function of the perceived consequences of the related behaviour (Stroebe & Stroebe, 1995).

2.3.2 Intentions

Fishbein and Ajzen (1975) define intentions as the immediate antecedents of subsequent overt behaviours. Intentions can further be described as a person's immediate readiness to perform a particular behaviour as symbolized cognitively (Ajzen, 2002). Intention is the subjective probability a person has about whether or not they will carry out a particular behaviour Fishbein and Ajzen (1975). Intentions are be distinguishable from attitudes in that an attitude toward an object can be totally unrelated to an intention to perform a specific behaviour with respect to that object (Fishbein and Ajzen, 1975). For example, a person's attitude toward using sunscreen in general may not necessarily be the same as their specific intention to apply sunscreen before sunbathing.

Sets of intentions can, however, define a person's attitude - the overall favourableness of a person's intention can be determined by their attitude (Fishbein & Ajzen, 1975). Two people may hold the same attitudes toward something, but differ in their intentions to carry our specific behaviours in relation to that entity. For example, two people might both have the same attitude toward using sunscreen, but one might intend to apply sunscreen regularly when on the beach and intend to have enough to last the day, the other might intend to apply sunscreen 20 minutes before they go to the beach and not take any extra with them, thus not intend to apply sunscreen.

Intentions are changeable by other variables, but generally only via attitudes, subjective norms and perceived behavioural control (Ajzen, 2002). Fishbein and Ajzen (1975), outline three contributing variables that influence the intention-behaviour relationship, the first being that the specification of the target behaviour must match that of the intention being measured. Secondly, the intention must be stable over time, and thirdly,

that volitional control, where other people and uncertain events, may also influence a persons intentions. Thus, in *predicting* behaviour, measurement of intentions is effectual, whereas to *understand* behaviour other factors must also be examined (Fishbein & Ajzen, 1975). Further studies have considered intention and its effect on behaviour, Sheeran (2002) discovered that 47% of people who actually form intentions fail to act on them and that 93% of people who intend to act on their intentions never do.

2.3.3 Subjective Norms

The theory of planned behaviour recognizes that an individual's behaviour is often influenced by other people's approval of that individual's behaviour (Abraham, 1999). The concept of subjective norm is created when the perceptions of other's approval are proliferated by the person's own aspirations to comply with these significant others' wishes (Fishbein & Ajzen, 1975). In other words, it is the individual's perceptions of pressures from society about performance of the behaviour (Armitage & Conner, 2001). Therefore, if an individual perceives that the opinion of a significant other(s) is favourable toward the behaviour they are intending to perform, then it follows that the individual is more likely to perform that behaviour. The person then in turn would be less likely to perform the behaviour if they perceived that the significant other disapproved.

Whether or not normative beliefs influence intentions must also depend on the individuals motivation to comply with this norm (Stroebe & Stroebe, 1995). For example parents want their children to apply sunscreen but if the child is not willing to comply with this wish then it will affect their intention to apply sunscreen. It follows that subjective norm is the subjective likelihood that a significant other thinks the individual should perform the behaviour multiplied by that individuals drive to comply with the significant other's wish (Stroebe & Stroebe, 1995).

2.3.4 Perceived Behavioural Control

Perceived behavioural control is often included with or defined as a measure similar to Bandura's (1977) notion of self-efficacy. There has been much debate over use of the term self-efficacy in place of perceived behavioural control in the literature. Self-efficacy is defined as a perceived self-confidence or self-competence to perform the

target behaviour. Self-efficacy means the overall sense of control one has over resources and perceived barriers to carrying out a particular behaviour (Abraham & Sheeran, 2000). A person must believe that they can effectively perform certain behaviours, otherwise when faced with difficulties and set backs, they may feel that they cannot override them and subsequently not carry out the behaviour. Perceived behavioural control, on the other hand, ultimately means control over perceived barriers and difficulties one might encounter on the way to executing a particular behaviour.

Two studies have found that self-efficacy is better at the prediction of behavioural intention, while perceived behavioural control better predicts actual behaviour. White, Terry and Hogg (1994) found that perceived behavioural control was stronger at predicting condom use that intention to condoms. Likewise, Terry and O'Leary (1995) showed perceived behavioural control predicted exercise behaviour over self-efficacy, which was better at the prediction of intentions.

Ajzen (1988) argues that the power of perceived behavioural control on predicting intention's will vary across situations and behaviours, notably those behaviours or situations which are more easily influenced by attitudes or societal norms. In contention for using the concept of perceived behavioural control over the concept of self-efficacy, several studies have analysed the effectiveness of using the former to predict behavioural intention. In an evaluation of the application of the theory of planned behaviour Godin and Kok (1996) found that perceived behavioural control predicted intentions in 85% of circumstances, while controlling for the effects of attitudes and subjective norms. In further meta-analytical studies it was discovered that perceived behavioural control contributed an additional 5% of the explained variance in intention (Sheeran, Abraham & Orbell, 1999) and 6% (Armitage & Conner, 2001).

Sheeran, et al., (2002) in an investigation the role of person type and perceived behavioural control, concluded that perceived behavioural control is a valuable predictor of intentions, even after controlling for both the attitude and normative variables in 29 out of 30 cases investigated. Perceived behavioural control is an important determinant of the stoutness of the intention-behaviour connection. In other words, a person who is influenced mostly by perceived behavioural control is more likely to form favourable intentions with regard to the target behaviour than a person

who is mostly influenced by attitude or subjective norm.

Orbell, Blair & Sherlock (2001) investigated the role of perceived behavioural control over taking versus obtaining ecstasy, and concluded that adding perceived behavioural control to the theory of planned behaviour increased the explained variance in intention by 7%. However, they also found that habit had a significant effect in increasing intention over and above that of perceived behavioural control.

2.4 Efficacy of the Theory of Planned Behaviour

In general, there has been much empirically validated research in support of applying the theory of planned behaviour to health-related behaviours (Conner & Sparks, 1996). The model has been applied to a wide range of health-related behaviours, including condom use, exercise promotion and drug and alcohol use. Armitage and Conner (2001) conducted a meta-analytic review of the literature of the efficacy of the theory of planned behaviour. They found that the theory of planned behaviour variables together accounted for 39% of the variance in intention and for 27% of the variance in behaviour. Armitage and Conner (2001) found that with the addition of the perceived behavioural control variable, significantly more amounts of explained variance could be accounted for. The theory of planned behaviour accounted for notably more variance in individuals' needs than intentions or self-predictions, but intentions and self-predictions were superior predictors of behaviour (Armitage & Conner, 2001). However, these authors also found that subjective norm was a weak predictor of intentions. Conner and Armitage (1998) have investigated the impact of questionnaire format on the validity and reliability of the theory of planned behaviour. Their study predicting food choice intentions found that questionnaire format had only a moderate impact on the theory of planned behaviour component relationships.

2.5 The Theory of Planned Behaviour and New Variables

Various studies have considered additional variables in improving the utility of the theory of planned behaviour. As Ajzen (1988) stated

> "The theory of planned behaviour is, in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention after the theory's current variables have

been taken into account."

A large portion of the variance in intention and behaviour cannot be explained in terms of theory, it is hoped that with the investigation of new constructs, the predictive power of the theory of planned behaviour will be improved (Armitage & Conner, 2001).

2.5.1 Descriptive Norm

A distinction has been made within the normative component of the theory of planned behaviour, between descriptive norms and subjective norms. While subjective norms refer to perceived social pressure from other people in general, descriptive norms refer to one's perceptions about others' performance of a given behaviour (Cialdini, Reno & Kallgren (1990). White et al. (1994) outline that descriptive norms are made up of others' attitudes (*group attitude*) toward the target behaviour and perceptions of their behaviour (*group behaviour*). Sheeran and Orbell's (1999) investigations found descriptive norm and subjective norm to be distinct constructs after factor analysis. As outlined previously, subjective norm only on occasion predict intentions, and in most studies only explain small proportions of additional variance. It follows that the inclusion of an extra normative component to the theory of planned behaviour, like descriptive norm should enhance the models power of prediction.

Several studies have explored the role of descriptive norms and their contribution to the theory of planed behaviour in the prediction of intentions. For example, White et al. (1994) in their research into safer sexual behaviours established that descriptive norms explained a significant proportion of the variance in intentions. However, they failed to enter the descriptive norm component into the regression equation after the other theory of planned behaviour variables had been controlled for, thus giving unclear results of the role of descriptive norms. Sheeran and Orbell (1999) in three correlational studies involving intentions to play the lottery found that descriptive norms were significant and high predictors of intentions and contributed sizeable variance over and above the theory of planned behaviour.

2.5.2 Outcome Expectancy

The concept of outcome expectancy originates from Bandura's (1977) social cognitive theory. According to social cognitive theory, behaviour is regulated by three types of expectancies, or beliefs about the outcome of particular behaviours (Schwartzer, 1992).

These are situation-outcome expectancies (which occur regardless of ones behaviour), outcome-expectancies (the presumed normal consequences of a behaviour) and, self-efficacy expectancies (whether or not a person thinks they are capable of performing a given behaviour). It follows that performance or non-performance of a health-related behaviour can depend upon the expectancy that the situation where the behaviour is to be carried out in is hazardous or not; if the performance of the behaviour will reduce threat; and the expectancy of whether one is competent enough to perform the appropriate behaviour (Schwarzer, 1992). Schwarzer (1992) classifies outcome expectancies are antecedents to self-efficacy, because an assumption about the possible consequences resulting from a given behaviour is usually made before an assessment of whether one can actually perform the behaviour. Ajzen (1988) on the other hand, classifies outcome expectancy within the concept of perceived behavioural control.

Outcome expectancies have been well researched in areas where beliefs about certain risk behaviours will produce a desired outcome. Previous research in this area has included, for example, crack cocaine smokers intentions to use condoms (Bowen, Williams, McCoy & McCoy, 2001). This study found that outcome expectancies and normative beliefs were the strongest predictors of condom use. Cross-sectional research has shown that negative outcome expectancies outweigh positive outcome expectancies for individuals contemplating performance of a particular behaviour. However, as the pre-contemplation stage progresses, positive outcome expectancies increase and negative outcome expectancies decrease for most health behaviour, thus reversing the relationship between the variables (Prochaska, DiClemente & Norcross, 1992). Outcome expectancies can be related to sunscreen use in that not using sunscreen my produce positive emotions relating to one having a tan.

Within the theory of planned behaviour, beliefs are associated with attitude in an expectancy-value framework of which Ajzen and Fishbein (1980) emphasise should contain specific items that examine individual expectations produced from the target behaviour. These salient beliefs should be well researched prior to measurement (Hankins, French, & Horne, 2000). Schwarzer (1992) suggests that the theory of planned behaviour could be used with simply two cognitive antecedents to behaviour: behavioural beliefs and perceived behavioural control. He further proposes that these could be re-labelled as outcome expectancies and self-efficacy expectancies to bring

this theory in line with social cognitive theory. However, for the purpose of the current study, the definition of perceived behavioural control will follow the recommendation of Ajzen and Fishbein (1980).

2.5.3 Implementation Intentions

The formation of an intention takes place over two stages, the first stage is the motivational stage (action preparation and intention formation), and the second stage is an implemental (or action) stage, which involves action instigation and maintenance (Gollwitzer, 1999). Gollwitzer (1999) labels this implemental (or action) stage as the formation of implementation intentions (or plans) about how to carry out a particular behaviour. The formation of implementation intentions is a similar process to that of goal setting. The concept of goal-setting intentions relates to a specified outcome or behaviour to which a person feels committed to achieve, and the concept of implementation intentions refers to the details of when, where and how the goal-directed intention is to take place (Brandstatter, Lengfelder & Gollwitzer, 2001).

While intentions are relatively good markers for the performance of behaviour, they still leave around 50% - 60% if the variance unexplained (Orbell & Sheeran, 2000). To attempt to overcome this shortfall, implementation intentions are introduced to the theory of planned behaviour equation. Implementation intentions are more detailed plans of intentions that stipulate when and where certain behaviours are to be performed and subsequently transform intentions into action (Gollwitzer, 1999) Implementation intentions can distinguish between intender's who act and those who do not (Gollwitzer, 1999). When an individual contemplates performing a given behaviour, if they have identified a specific time and place where the behaviour can be carried out, they will be more likely to actually perform that behaviour (Gollwitzer, 1999). Implementation intentions have the role of supplementing intentions to enhance (Orbell, Hodgkins, & Sheeran, 1997). They are useful in achieving behavioural goals that have been put off or postponed (Orbell, et. al., 1997).

Gollwitzer (1999) stipulates that implementation intentions are similar to habits, but are on a cognitive rehearsal level rather than at a situational level, as are habits. A person forms a habit after repeating a task so often it becomes automatic, habits are related to

past behaviour, and have been found to reliably predict future behaviour in a number of studies (Conner & Armitage, 1998). Habits are a result of situational factors that serve as cues for a person to perform the target behaviour (Gollwitzer 1999). Implementation intentions, on the other hand, are memory triggers that come into an individual's awareness following perspective plans made about how to carry out the target behaviour (Gollwitzer, 1993). Habits are distinct from implementation intentions in that a single mental act is required for formation of an implementation intention, and a habit only becomes automatic through regular and repeated responses to a set of stimuli (Brandstatter, Lengfelder and Gollwitzer, 2001).

Research on the use of implementation intentions to predict health-related behaviours has included that of Orbell, et al., (1997) and their study on using implementation intentions to improve rates breast self examination by women. It showed that by adding the concept of implementation intentions to the theory of planned behaviour model, the power of intentions to produce increased pursuit of desired goals was improved. This study found that when a specific plan is formed about enacting the target behaviour, opportunities for performance were less likely to be missed. Gollwitzer (1993) also points out that with a specific plan in mind, subjects were more likely to perform the desired behaviour sooner, rather than put action off to some later date.

Brandstatter, et al., (2001) in their study on the efficiency of implementation intentions and goal directive behaviour of recovering opiate users and schizophrenics, found that implementation intentions had immediate and specific effects on attaining goals. Brandstatter, et al. (2001) also found that implementation intentions were efficient, did not require large amounts of resources, could be carried out simultaneously with other activities and freed up cognitive space by becoming habitual thus allowing for more difficult tasks to be performed.

Orbell and Sheeran's (2000) study on initiation of activity following joint surgery found that implementation intentions mediated the effects of intention on behaviour. The authors reported that implementation intentions explained the transformation of goals into action.

Further to the previous discussion about implementation intentions and habit, the

important distinction between implementation intentions and past behaviour must be emphasised. Orbell, et al., (1997) point out this distinction and also that past behaviour has been found in many studies to have a strong relationship with behaviour because of previously formed habits. Past behaviour is associated with environmental cues, which are the repeated pairing of the behaviour within the context of it being carried out (Orbell, et. al., 1997). However, Orbell, et.al (1997) also call attention to the fact that intentions are liable to change over time, they are unstable. They postulate that a person will not be influenced by past behaviour, when they have formed specific implementation intentions. This suggests that implementation intentions imitate habit, but that matching context and behaviour is a product of cognitive rehearsal rather than behavioural rehearsal, as is the case with habit (Orbell, et.al, 1997). Implementation intentions totally mediated the impact of past behaviour on behaviour (Orbell, et. al., 1997).

Jones, Abraham, Harris, Schulz and Chrispin (2001) point out that there has been insufficient research using post-decisional cognitions, like implementation intentions, and their relationship to sunscreen use. Adding implementation intentions to the model of the cognitive antecedents of sunscreen use could be useful. For example, if a person sets out a time and place that they are going to apply their sunscreen, they will be more likely to apply it, i.e. a person may plan to apply their sunscreen in the bathroom while putting on their swim-suit, because that is where their sunscreen is kept, and putting on their swim-suit usually happens before they go to the beach to sunbathe. Jones et al. (2001) found that adding the variable *prior planning,* or implementation intentions, contributed as much to predicting sunscreen use, as did intention and that prior planning had both a mediating (partial) and moderating affect on intention. However, they also note that implementation intentions may not always be necessary. They suggest that implementation intentions may be moderated by other variables, like past behaviour and that future research may investigate the distinction between the planning and intention constructs.

Thus, it is expected that by forming specific implementation intentions as to where and when a beach-goer is going to apply their sunscreen, they will be less likely to forget to apply sunscreen and will be more likely to act faster, should an unexpected situation arise when they need to apply sunscreen in a different situation, for example, at a

friends place, they will already have an implementation plan. In an unpublished study in New Zealand (Seymour, 1999) implementation intentions were strongly correlated with intention to use sunscreen.

2.5.4 Past Behaviour

Few health behaviour models include measures of a person's past behaviour as a contributing factor in prediction of their future behaviour (Conner, Warren, Close & Sparks, 1999). Several studies have indicated that a person's past behaviour could be considered an independent predictor of future health related behaviours over and above the other constructs in the theory of planned behaviour (Conner, et. al., 1999). However, Ajzen (1998) contradicts these indications because of several reasons; the effects of past behaviour are mediated by the other theory of planned behaviour constructs; past behaviour shapes or reflects a person's beliefs about the said behaviour; and these cognitions ultimately decide on the subsequent behaviour.

Conner, et al., (1999) investigated the impact of past behaviour on alcohol consumption among students when added to the theory of planned behaviour. They found that the theory of planned behaviour could be successfully used to predict student's alcohol consumption intentions and behaviour, and that adding the additional variable of past behaviour, directly predicted behaviour over and above the original theory of planned behaviour constructs. Common method variance effects, when removed, showed that past behaviour was not fully mediated by the other theory of planned behaviour variables. In a similar sample Conner et al. (1999) found that the relationship between past behaviour and intention was mediated by the theory of planned behaviour variables. Overall, they conclude that the theory of planned behaviour could provide a direct relationship between past behaviour and intention.

Conner & Abraham (2001) investigated the role of personality variables and past behaviour in goal-directed behaviours, health protection and exercise. Past behaviour was found to have a strong relationship with intention ($r = .42$), but did not significantly improve the predictive power of the theory of planned behaviour on intention (Conner & Abraham, 2001). This effect was mediated by the other theory of planned behaviour variables (Conner and Abraham 2001).

Norman and Connor (1996) explored the effects (mediating and moderating) past behaviour had on the theory of planned behaviour model when predicting attendance at health-checks by prior attenders and non-attenders. The study was designed to increase the rates at which people regularly underwent health-checks. The study found that the theory of planned behaviour alone was a weak predictor on attendance behaviour (3% of the variance), but when past behaviour was added this rose 7%, albeit an unexceptional amount. Norman and Connor (1996) found that attending a health-check when previously having attended was not mediated by other cognitive variables therefore making the behaviour more easily achievable.

Norman, Conner and Bell (2000) investigated the moderating role of past behaviour on the theory of planned behaviour variables in the prediction of exercise intentions. Past behaviour moderated the perceived behavioural control-behaviour relationships, which is in line with Ajzen's comparable (1988) proposal.

The addition of past behaviour to the theory of planned behaviour for enhancing intentions to use sunscreen and for using sunscreen itself will attempt to improve sunscreen use promotion campaigns by emphasising that people keep up with their previous sunscreen use behaviours and continue to do so in the future. However, further investigation would clarify the possible independent relationship past behaviour has with intention to use sunscreen or instead show that it only affects intention via the theory of planned behaviour variables. It also follows that more conclusive results about the role of past behaviour on predicting intention to use sunscreen would result from moderation analyses assessing whether the strength of the theory of planned behaviour-intention relationship would decrease as the frequency of past behaviour decreased (Norman et al. 2000).

2.5.5 Anticipated Regret

Anticipated regret can be defined as the range of uncertainties, worries and regrets a person contemplates before making a decision about engaging in certain behaviours (Janis & Mann, 1977). One limitation in the application of the theory of planned behaviour has been the comparative neglect of the affective component of anticipated

regret in attitude formation (Richard, van der Pligt and de Vries, 1995). This particular affective component has been highlighted by Ajzen (1988) as a separate element from the cognitive component of attitude, which has been the prominent focus in the majority of empirical studies. Norman and Conner (1995) outline anticipated emotion as a potentially effective variable to be considered in health behaviour prediction, particularly when the resulting emotions from performing the behaviour are generally negative.

Anticipated regret has been found to predict intentions in a variety of health-related behaviours. In studies by Conner and Abraham (2001) it was found that anticipated regret correlated strongly with strength of intention and explained an additional 26% of the variance in intentions over and above the theory of planned behaviour constructs. Anticipated regret has been examined in a study of cycle helmet wearing among teenagers (Sissons-Joshi, Beckett & MacFarlane, 1994) where it was found to distinguish between wearers and non-wearers. It has also been used in improving prediction of intent to commit a driving offence (Parker, Manstead & Stradling, 1995). In further studies, anticipated regret has shown to be important in predicting expectations in contraceptive and sexual behaviour (Richard, Van der Pligt, & de Vries, 1998). These authors found anticipated regret predicted a significant and independent proportion of variance in expectations about future contraceptive behaviour.

In studies of the role of anticipated regret and descriptive norms, Sheeran and Orbell (1999) found that anticipated regret was a distinct construct (within the theory of planned behaviour) and was a highly significant predictor of intention to play the lottery, where participants experienced regret if they did not play. They also found that anticipated regret moderated the relationship between intentions and behaviour, reducing all other predictors to non-significance. However, it was not clear why this moderation effect occurred. They suggest that the role of anticipated regret needs to be explored with a wider variety of behaviours to improve generalizablity.

Jones, et al., (2001) in their sunscreen study highlighted that forming intentions, which are fundamental in measures of attitude, an individual always considers anticipated consequences of their desired behaviour. The assumption underlying the role of anticipated regret is that sunbathers anticipating the negative consequences (i.e.

sunburn/skin cancer) of lying out in the sun without sunscreen might be influenced by these negative feelings an thus decide to use a sunscreen. However, the Jones et al., (2001) study did not consider the role of anticipated regret on sunscreen use, leaving room for further investigation into its generalizablity to other health behaviours. Furthermore, Kieling and Friedman (1987) found that sunscreen use was related to mood and suggested that forthcoming research should include investigation of affective variables like negative mood states. Seymour (1996) found that anticipated regret was strongly correlated with intention to use sunscreen.

2.5.6 Conscientiousness

Personality Theory highlights the role of the Big Five personality traits; extraversion, agreeableness, neuroticism, openness and conscientiousness; (Allport and Odhert, 1936) and their effectiveness as behavioural determinants. Conscientiousness can be defined as being purposeful, strong-willed, responsible and trustworthy (McCrae & Costa, 1987). Research has focused on how each of these traits may contribute to individual's health-related behavioural decisions. The trait of conscientiousness has been found more strongly correlated with health-related behaviours than any of the other Big Five personality traits (Booth-Kewley & Vickers, 1994). One noteworthy study into mammography attendance behaviour (Siegler, Feganes, & Rimer, 1995) observed that regular attendance could be predicted by conscientiousness (and also extraversion) and that the cognitive antecedents to attendance, such as perceived risk, mediated these effects.

Conner and Abraham (2001) found conscientiousness to be an exceptionally valuable personality trait in relation to health behaviours. They found that conscientiousness directly affected behavioural intention and also affected intention via attitude. Conscientiousness had a direct effect on intention rather than via attitudes. Conner and Abraham (2001) suggested additional exploration into the mediating effects of conscientiousness whether wholly or partially mediated by other behaviour related cognitions. Ingledew and Brunning (1999) found conscientiousness and agreeableness to have a main effect on preventive health behaviour out of all the personality variables. The authors also report interaction effects between conscientiousness and agreeableness and suggest that conscientiousness might also interact with a measure of social desirability. Castle, Skinner and Hampson (1999) found that sun protection was a

significant function of knowledge when participants read a leaflet about the dangers of overexposure to the sun. They also found that people who are more conscientious tend to engage in more sun protection behaviour. These findings emphasise the vital role of conscientiousness in intention formation and behavioural performance and indicate a possible independent role.

2.5.7 Global Self-esteem

According to Lewin (1935) self-esteem has immense potential for influencing the performance of positive health-related behaviours. Lewin (1935) has argued that individuals with high self-esteem are able to demonstrate well-integrated behaviour, and are able to comprehend how some behaviour might impinge upon their health. Lewin (1935) also states that high self-esteem can reduce the influence of extraneous variables, for example, social pressures, which may impact on a person being able to implement positive health behaviours.

Research into how self-esteem has contributed to changing health-related behaviours has included investigations of its contribution to the theory of planned behaviour. Davis, Johnson, Miller-Cribbs, and Saunders (2002) found that self-esteem added only a small increment in explained variance in African American students intentions to stay in school. A study examining the relationship between self-esteem, health behaviours and breast self-examination among female prison inmates found self-esteem to be uncorrelated with knowledge about breast self-examination (Brewer & Baldwin, 2000). Because of the lack of significant findings in these studies it follows that further research on the influential role of self-esteem on health behaviours might provide a clearer picture of its role.

In New Zealand, McGee and Williams (2000) longitudinally examined both global and academic self-esteem in relation to a variety of health compromising behaviours among adolescents. The results of their study found that self-esteem developed early in life could reliably predict later problem eating and suicidal ideation but was unrelated to substance abuse and early sexual activity. Their suggestions for future research included how self-esteem might generalize to other health compromising and health enhancing behaviours (McGee & Williams, 2000).

2.5.8 Importance of Tan to Self-esteem

In earlier centuries, having a suntan was considered to be a symbol of poverty or membership of a lower class. A suntan was obtained through outdoor work in the fields symbolic of those of the working classes. As times changed and people began to work undercover in factories this sun-tanned look was lost among the working class (Koblenzer, 1998; Chapman, Marks & King, 1992). During the 1920s tanned skin became popular because it showed that one was wealthy and could afford to go on holidays to warmer climates (Chapman, et.al, 1992). Since the 1930s, and through until the 1970s, it became increasingly fashionable to be suntanned (Boyle, et. al., 1995).

One interesting study by Chapman, et al., (1992) looked at how fashion magazines have changed the way they portray tans and sun protective behaviour in the form of hats and clothing. It was found that the depth of tans of models in leading magazines had clearly decreased throughout the eighties and early nineties after a period of high depth tans in previous years. However a number of factors could signify these trends: fashion, increased awareness or model skin types used.

An image of a healthy outdoor New Zealander with a glowing tan prevails. Having a suntan is correlated with being healthy and attractive so actively obtaining a suntan leads people to see themselves as more attractive (Broadstock, Borland and Gason, 1992). Leary and Jones (1993) showed that episodes in sun-tanning behaviour could be reliably predicted by constructs that were coupled with an individuals desire to enhance their personal appearance. Even though people most likely wish to avoid sunburn, having a tan can often make person be more nonchalant toward sunburn and sun protection (Chapman, 1999). Chapman (1999) also argues that perhaps cancer prevention organizations should aim sunscreen promotional campaigns at 'safe' tanning rather than the absolutist standpoint of 'no' tanning.

Castle, et al. (1999) found that in young women the benefits of having a tan outweigh the costs of being burnt or risk of developing skin cancer. Kiesling and Friedman (1987) revealed that possessing a suntan was related to maintaining an image of the self as an active, healthy and attractive person.

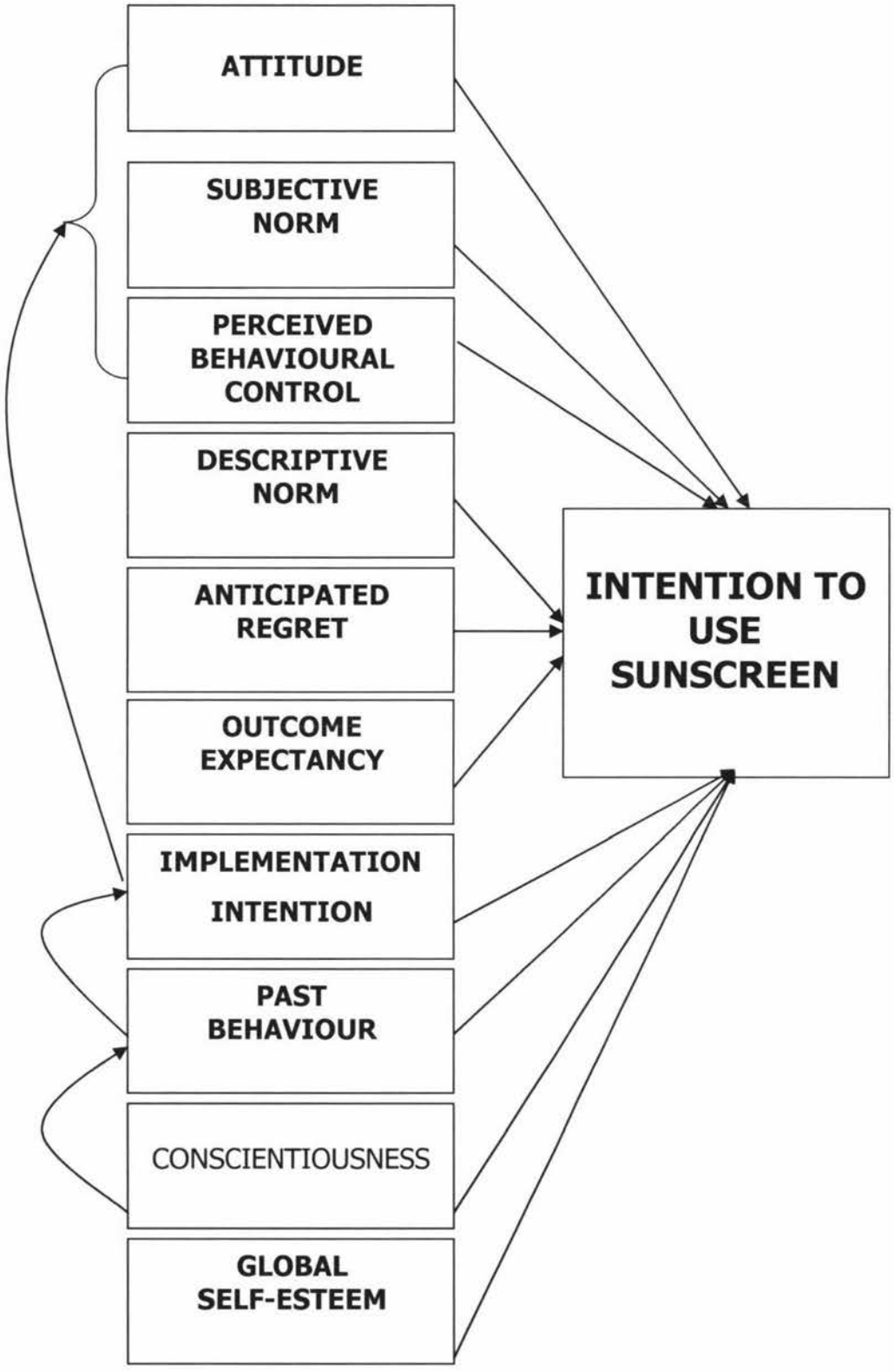


Figure 2 Additional variables that may improve prediction of intention to use sunscreen in addition to the theory of planned behaviour variables including possible mediation relationships.

2.6 Previous Studies in Sun Protection Behaviour

Social cognitive models have been valuable in predicting use of sunscreen. Castle et al. (1999) found that increasing knowledge about the dangers of the sun and methods of sun protection was enough to increase sun protective measures among young women who considered a tan to be important. Koblenzer (1998) established that among those who did not use sunscreen, the immediate benefits of a tan far outweighed their belief that skin cancer was not a very serious problem. Koblenzer (1998) also identified beliefs about sunscreen being 'sticky' and 'expensive' which presented a personal barrier to using sunscreen.

Sun protection behaviour can also be influenced by subjective norms. Kiesling and Friedman (1987) reasoned that social influences might maintain sunbathing behaviours. An example of a social influence on use of sunscreen could be a positive comment made about the attractiveness of a person's suntan. Positive attitudes toward suntans are maintained through the strong social influences of fashion and peer pressure (Kiesling & Friedman, 1987). Their study also found that having a suntan is related to sustaining a self-image of being active, healthy and attractive and being a member of certain social networks. Because having a tan is closely associated with self-image, interventions aimed at increasing sunscreen use would have more effect than attempting to reduce sunbathing behaviours (Kiesling & Friedman, 1987).

Hillhouse et al. (1997, in Jones et al, 2001) investigated using the theory of planned behaviour to predict sunscreen use, and found that subjective norms, attitudes and perceived behavioural control accounted for 37% of the variance in intention to use sunscreen and that these intentions accounted for 49% of the variance in actual sunscreen use.

Using the theory of planned behaviour to construct a model of the cognitive antecedents of sunscreen use, Jones, et al., (2001) found that knowledge, norms, perceived threat, self-efficacy and importance of short-term negative consequences accounted for 44% of the variance in intentions to use sunscreen. Jones et al., (2001) emphasize that

sunscreen promotional campaigns would be more successful if they concentrated on changing intentions to use sunscreen. Their study found that perceived norms had only a weak correlation with sunscreen use. The value of short-term negative consequences was found to have the maximum effect on intention and planning; self-efficacy had a moderate effect, and knowledge, normative beliefs and threat had the smallest effect on intentions.

Some preliminary unpublished research was carried out on predicting the cognitive correlates of sun protective behaviour in New Zealand (Seymour, 1999). It was found that intention was the most reliable predictor of sunscreen. Furthermore the predictive power of intention became stronger when the motivation to prevent the negative effects of the sun and how likely this threat was to take place were taken into account (Seymour, 1999). The study also suggested that plans did not mediate intentions and that it was the likelihood of threat rather than perceived threat that increased intentions.

3 The Present Study

3.1 Statement of research goals

The importance of designing more effective interventions to promote sunscreen use is evidenced in the high rates of melanoma both in Britain and New Zealand. By better understanding the cognitions and personality variables involved in intention formation and sunscreen use, sunscreen promotional campaigns can be refined for use with targeted high-risk groups like beach-goers. There has been little research comparing New Zealand populations to other countries.

The current study builds on the aforementioned research, using the theory of planned behaviour and additional, potentially useful cognitions and personality traits to enhance prediction of intention to use sunscreen. It aims to enhance the predictive power of the theory of planned behaviour and develop a more robust model of the cognitive antecedents of sunscreen use, which will in turn develop more valuable sunscreen use interventions. This study aims to develop a clearer understanding of why individuals perform certain health behaviours, which may assist in developing interventions to help individuals gain the benefits of increased health and well-being.

3.2 Hypotheses

Hypothesis 1

The components of the theory of planned behaviour; attitude, subjective norm and perceived behavioural control will be directly related to intention to use sunscreen.

Hypothesis 2

Attitude, subjective norm and perceived behavioural control will together be predictive of positive intention to use sunscreen.

Hypothesis 3

Furthermore there are other factors that will have an effect on intention to use sunscreen. Together anticipated regret, implementation intentions, outcome expectancy,

past behaviour, global self-esteem, conscientiousness and descriptive norm will be correlated to intention to use sunscreen (Figure 2).

Hypothesis 4

Together, anticipated regret, outcome expectancy, past behaviour, global self-esteem, conscientiousness and descriptive norm will improve the power of the theory of planned behaviour variables in predicting intention to use sunscreen.

Hypothesis 5

Implementation intentions, or the formation of a specific plan about using sunscreen, will be related to intention to use sunscreen (Figure 2).

Hypothesis 6

Implementation intentions will improve the predictive power of the theory of planned behaviour in prediction of intention to use sunscreen.

Hypothesis 7

Implementation intentions will mediate the relationship of the theory of planned behaviour-intention to use sunscreen relationship (Figure 2).

Hypothesis 8

Implementation intentions will moderate the relationship between the theory of planned behaviour variables and intention to use sunscreen (Figure 3).

Hypothesis 9

Past behaviour will be related to implementation intentions (Figure 2).

Hypothesis 10

Past behaviour will affect intention to use sunscreen via implementation intentions. There will be evidence of mediation (Figure 2).

Hypothesis 11

Past behaviour will be mediated by the theory of planned behaviour variables. Past behaviour will affect intention to use sunscreen via the theory of planned behaviour variables (Figure 2).

Hypothesis 12

Past behaviour will moderate the relationship between the theory of planned behaviour variables and intention to use sunscreen (Figure 4).

Hypothesis 13

Past behaviour will affect intentions via conscientiousness. There will be evidence of mediation (Figure 2).

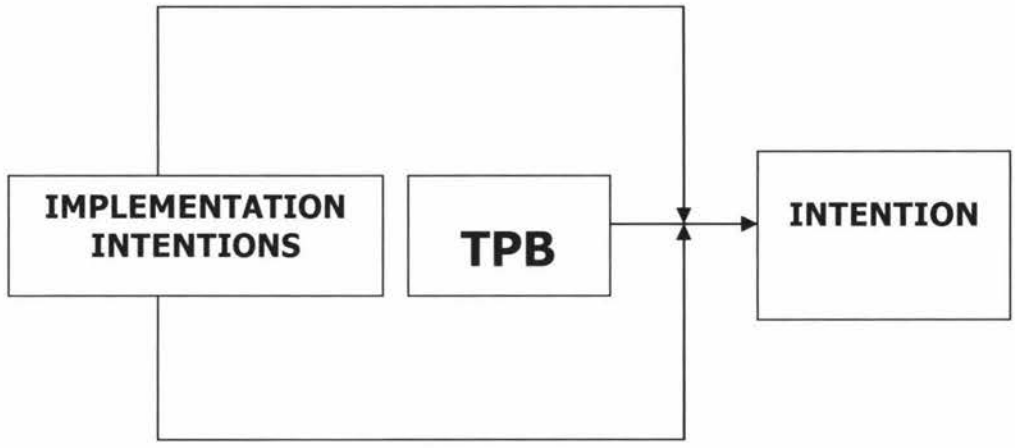


Figure 3 Moderation of the relationship between the theory of planned behaviour and implementation intentions

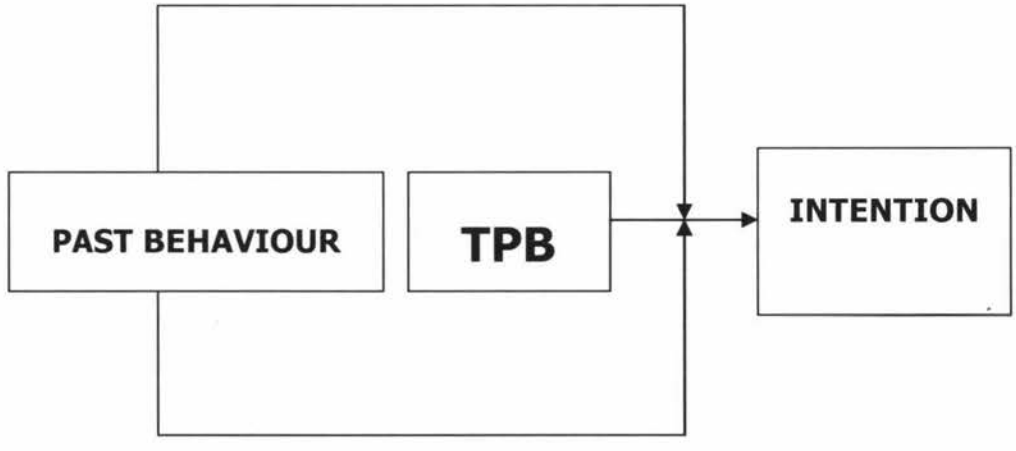


Figure 4 Moderation of the relationship between the theory of planned behaviour and past behaviour

4 METHOD

Respondents were recruited on Mount Maunganui (N.Z sample) and Brighton and Hove (U.K sample) beaches, both popular for sunbathing.

4.1 New Zealand Sample

4.1.1 Respondents

Data was collected on sunny or partially sunny days in March and early April. Participants were approached if they were lying out in the sun in swimwear, but were not approached if they were fully clothed or were on the beach for brief periods such as when walking or running.

A total of 158 people were approached and out of these 151 accepted the offer to participated. The response rate for completing the questionnaires was 96%. The sample consisted of 151 people, 56 of which were male and 95 of which were female. The ages of respondents ranged from 14 to 82 years (M= 35.44, S.D.= 14.76). There was a variety of nationalities that participated, with 78.8% of the sample identifying as New Zealanders, 16.6% identified as European, and the remaining 4.6% divided equally between American and South African.

In the final section of the questionnaire, respondents were asked to rate on a scale of one to seven how easily their skin became sunburnt. Of the respondents who answered this question 21.9% rated their ease of burning as moderate, 7.3% answered that their skin burned easily, and 9.3% indicated that they did not burn easily at all.

Respondents were also asked to stipulate their natural hair colour, and 41.9% of those whom answered this question said that they had dark brown hair. A further 29.1% indicated that their natural hair colour was light brown, 18.5% boasted blonde hair, 5.3% had black hair and the remaining 1.3% identified as being red headed.

4.1.2 Measures

The questionnaire was a replication of that used in the University of Sussex (U.K.) study with the exception of the control being adapted for use in New Zealand.

The questionnaire was presented in three parts. The first section measured the cognitive antecedents of sunscreen use and behavioural intention to use sunscreen (Appendix B). The middle part of the questionnaire involved an intervention where respondents read a brief paragraph about facts of malignant melanoma (mortality-salience), the effects of photo aging (attractiveness) or a story about Mauo, the 'mountain' in Mt Maunganui (control). Pictures were presented and then brief questions relating to the paragraph asked. Respondents were randomly assigned to each group by the researcher handing out questionnaires from one group on each day and then questionnaires from the other groups on subsequent days. The post-intervention section of the questionnaire posed questions about respondent's opinions and how these had changed after the intervention. These sections of the questionnaire were not included in the analysis of this study, but were used by another researcher. A measure for the personality trait 'conscientiousness' (a stable construct) was included in the last part of the questionnaire and was analysed for this study. All participants completed the pre and post-intervention (conscientiousness) sections of the questionnaire and it is these sections that were the focus of the current study.

Demographic questions included in the questionnaire, enquired about the respondents age, sex and nationality. Two final questions asked about hair colour and susceptibility to sunburn. For: "What is your natural hair colour" respondents were required to tick the appropriate box (*black, brown, light brown, blond or fair, and red*). A 7-point scale question measured how easily the respondents' skin got sunburnt: "How easily does your skin get sunburnt?" (*easily - not at all easily)* with the higher score indicating that the respondents skin did not burn at all easily.

The majority of questions were presented in the form of 7-point Likert scales that gauged each of the Theory of Planned Behaviour constructs. Measures of subjective and descriptive norm, attitude, perceived behavioural control, implementation intention, global self-esteem, importance of tan to self-esteem, conscientiousness, past behaviour, outcome expectancy and anticipated regret were used.

4.1.2.1 Pre-intervention measures

Attitude

Attitude toward using sunscreen on the beach on that particular day was assessed with six bipolar scales (*bad-good, harmful-beneficial, unpleasant-pleasant, unenjoyable-enjoyable, risky-safe, reassuring-troubling*). The reassuring-troubling item was presented on the questionnaire in reverse order (i.e., 'reassuring' being worth less points on the scale and 'troubling' worth more) and was re-coded to match the other items. The Cronbach alpha coefficient at .81 was above the recommended level of .70 (Hair et. al, 1998) and thus the attitude items were averaged into an overall score. Higher scores signified a more positive attitude toward sunscreen use.

Descriptive Norm

Descriptive norms were measured by two items: "Do you think people of your age and sex think they should use sunscreen when on the beach?" ranging from 1 (*definitely do*) to 7 (*definitely do not*) and "Most people on the beach today will be using sunscreen", ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Cronbach alpha for these items was low at .20 so the descriptive norm items were used as separate measures. Item number 12 was recoded so it matched the direction of the other scales.

Subjective Norm

Subjective norm was measured with the question "People who are important to me think I should use sunscreen when on the beach today" with the scale of 1 for 'strongly disagree' to 7 'strongly agree'.

Intention

Intention to use sunscreen was measured by three items: "I intend to use sunscreen on the beach today" where respondents answers ranged from *strongly disagree - strongly agree*, "I will try to re-apply my sunscreen often enough to ensure adequate protection on the beach today" which ranged from *likely - unlikely,* and "I intend to re-apply my sunscreen often enough to ensure adequate protection on the beach today" which, again extended from *strongly disagree - strongly agree*. Responses to each item were shown on a scale of 1 – 7, with a score of 1 indicating low intention and a score of 7 indicating a high intention to use sunscreen. These items formed a composite scale ($\alpha = .80$). Item

number 20, the second question that measured intention was recoded to ensure all intention items were scaled in the same direction.

Perceived Behavioural Control

Perceived behavioural control was evaluated by three questions: "For me to use sunscreen when on the beach today would be" (*difficult – intermediate - easy*), "how much control do you have over whether you use sunscreen when on the beach today?" (*No control – intermediate - complete control*), and "For me to use sunscreen often enough to ensure adequate protection today would be" (*difficult – intermediate - easy*). The lower the respondents reported score, the less perceived behavioural control. These items formed a composite scale ($\alpha = 0.72$).

Self-Esteem

The single item that measured self-esteem was: "I have high self-esteem". The response was rated from 'not very true of me' at a score of 1, to 'very true of me' with a score of seven.

Outcome-Expectancy

Outcome expectancy was derived from five items that consisted of the statements "I am more attractive when I have a tan?" where respondents rated from *strongly disagree - strongly agree*, "Sun tanned people do not look more attractive" (*strongly disagree-strongly agree*), "I look slimmer when I have a tan" (*strongly disagree-strongly agree*), " Having a tan helps me feel better about myself" (*strongly disagree-strongly agree*), and "Having a sun tan makes people look healthier" (*strongly disagree-agree*). The item "Having a tan helps me feel better about myself was originally classified as importance of self-esteem to tan item, but was included with the outcome expectancy items to improve scale reliability. The responses given on each item were rated on a scale of 1-7, with 1 indicating 'low outcome expectancy' and 7 indicating 'high outcome expectancy'. These items formed a composite scale ($\alpha = 0.71$).

Implementation Intentions

Implementation intentions, or planning, was measured by the questions: "Had you thought about the following before coming to the beach today?" where respondents were given two sub-items "taking sunscreen to the beach" and "putting sunscreen on

regularly on the beach" and were required to tick one of five boxes for each item (*had not occurred to me, had not thought about it, had occurred to me, had an idea about how to do this, and had a clear plan about how to do this*); the third planning item - "I plan to use sunscreen on the beach today" scoring 1 (*strongly disagree*) to 7 (*strongly agree*). The higher the respondents scored, the more planning was undertaken.

Because the responses to the three planning items were measured on different scales, they were converted to standardised z-scores to allow easier comparisons. The items formed a composite scale ($\alpha = 0.87$). The higher scores reflected higher planning to use sunscreen.

Past Behaviour

The item that measured the construct of past behaviour was: "In the past, how often did you use sunscreen when on a beach?" Respondents were instructed to place a tick in one of seven boxes, which was headed by the phrase that matched their answer (*never, almost never, a few times, sometimes, several times, quite often, all of the time*). These items were scored 1 for *never* to 7 for *all of the time.* A high score on this variable indicated high sunscreen use in the past.

Anticipated Regret

Anticipated regret was measured by one question with four parts: "How would you feel later if you did not use sunscreen on the beach today?" Respondents were required to circle one number from one to seven in each row (*worried-not worried, regret-no regret, tense-relaxed, upset-not upset*). The higher respondents scored on this question the more feelings of regret they experienced as a result of not using sunscreen. The items formed a composite scale ($\alpha = 0.91$).

4.1.2.2 Post-intervention measures

Conscientiousness

Conscientiousness was the final construct measured by a 5-point scale where respondents were asked to tick the most suitable box when answering the question: "I see myself as someone who... *1) does a thorough job 2) can be somewhat careless 3) is a reliable worker 4) tends to be disorganised 5) tends to be lazy 6) perseveres until the*

task is finished 8) makes plans and follows through with them 9) is easily distracted. Choices ranged from *disagree strongly – agree strongly.* Higher scores on these items indicated a higher degree of conscientiousness. The inter-item correlation was $\alpha = 0.74$.

4.1.3 Procedure

Two researchers approached every person on areas of the beach whether they were in groups or on their own. The researcher stated that they were from Massey University and that they were doing research on sunscreen use. It was explained that the research involved completing a confidential questionnaire that would take between five and ten minutes. Potential subjects were invited to take part and offered an information sheet (Appendix A). The agreement to participate was taken as an indication of informed consent.

After the subjects agreed to participate they were handed questionnaires from either the mortality-salience, appearance or control conditions. Subjects grouped together were all given the same type of questionnaire. Subjects that were in the mortality-salience condition were cautioned that they might find some of the pictures in the questionnaire to be moderately disturbing to give them an option to decline further participation. The questionnaires were handed out on a clipboard for ease of completion and respondents were given the brief instruction of

> "Remember this is not a test, answer exactly how YOU feel".

The researcher then either remained near to the respondents or carried on recruiting people further along the beach. The researchers stayed in the same area as the respondents so as to minimize any loss of questionnaires and answer any questions.
The researcher collected the questionnaires when the respondents indicated that they were complete. Upon completing the questionnaire, respondents were offered a leaflet outlining how to recognize potentially cancerous spots on their skin (Appendix C). These leaflets were provided free of charge by the Cancer Society in Tauranga. Respondents were also offered the chance to receive a summary of the results of the study and if so filled out a feedback request form (Appendix D). Subjects were informed that these details would be kept separate from their completed questionnaire and once the results were processed they would be notified by post.

The researchers covered separate areas of the beach and generally spent between one and four hours out each sunny day. Data was collected between the hours of twelve noon and four o'clock as these were the hottest times and there was, by and large more people on the beach at these times. The questionnaires were kept together with each of the researchers and sorted into each condition.

4.1.4 Ethical Issues

As outlined earlier, informed consent was assumed when participants agreed to complete the questionnaire following a brief explanation regarding their right to decline or withdraw during any part of the research. Confidentiality was assured as names or personal details were not obtained. The leaflet on skin cancer and how to spot signs of melanoma was given out to respondents as helpful advice to participants but they were not obligated to take it. The information collected from the questionnaires was used for research aims only and the raw data was only available to researchers.

4.2 UK Sample

4.2.1 Participants and Procedure

The following section is based on the corresponding section of Leete's (2002) dissertation submission.

Participants on Brighton and Hove beaches were recruited on sunny days (average temperatures ranging from 11 to 22 ^{o}C; sun index 6 and 7); were primarily Caucasian and wore swimwear on the beach. This sample selection criterion was chosen because it was expected that people in swimwear were likely to be intentionally sunbathing and therefore general views on the use of sunscreen could be obtained. Caucasian people were selected because they have the highest risk of skin cancer.

The researcher proceeded down the beach until a person who met study criteria was found. As each potential participant was approached, the researcher said:

> "Hi, sorry to disturb you, I am a university student and I am doing my project on the use of sunscreen and some negative effects of the sun. Would you mind filling out a questionnaire for me?"

If the person refused to participate, the next person who met the criteria was approached. Overall response rate was very high (approximately 90%). Each person who agreed to take part in the study did so voluntarily and it was made clear to all participants that they could withdraw from the study at any point. The person was then given a questionnaire and a pencil, and was informed that the researcher would return for collection in approximately 15 minutes. If, at this point the questionnaire was still uncompleted, the researcher left and returned few minutes later. Upon completion of the questionnaire, participants were offered a free leaflet containing web site addresses and telephone numbers where additional information about skin cancer and sun safety could be obtained (Appendix E). The majority of participants declined the offer of a leaflet; only 54 leaflets were given out.

In total, 283 participants took part in the study (111 males and 170 females; 2 missing values). The age of participants ranged from 8 to 78 years, with overall mean age of 32.29. The participants were primarily British, Scottish and Irish nationals (85.2%). Other nationalities included: 2.8% - Australians and New Zealanders, 2.8% - Swedish, 2.1% - French, 0.4% - Italian, 2.1% - other European, 1.4% - South African and 3.2% - other nationals. 50.5% of the participants rated themselves as burning easily and 49.1% considered themselves as having a skin that 'not easily burned'.

5 RESULTS

5.1 New Zealand Sample

5.1.1 Preliminary Analysis

Before undertaking standard multiple regression analyses to determine the nature of the relationship between the theory of planned behaviour and intention to use sunscreen, and the relationship between additional variables and intention, screening of data was necessary. Using SPSS version 11, data was screened for accuracy of data input and for violations of assumptions.

A missing value analysis was conducted to assess patterns of missing data. Overall, by examining the EM correlation tables the missing data appeared to be distributed at random across the data set. There were no variables with more than 5% of missing values, thus missing values were replaced with EM means. Case number 39 was excluded because of too many missing values across all items. Case number 46 was also removed due to the high proportion of missing values across individual variables. Missing data existed in a small number of variables for this case so it was excluded from the analysis. The final sample size was N = 148.

Means and standard deviations for the sample are shown in Table 5:1:1. When taking into account the minimum and maximum values for each variable the means are toward the higher end across all variables and the standard deviations are appropriate.

Table 5:1:2 shows the inter-correlations between the variables ($p<0.01$) using Pearson's product-moment correlation (two-tailed) coefficient. Attitude, subjective norm, perceived behavioural control, past behaviour and descriptive norm (1) all correlated strongly and positively with intention to use sunscreen. There was a strong negative correlation between anticipated regret and intention. Global self-esteem also shows a weak correlation with intention (-.05) as did outcome expectancy (-.68),

conscientiousness (.15) and descriptive norm (2) (01). There were also a number of significant correlations between the independent variables. Attitude was strongly related to all the variables except outcome expectancy, conscientiousness, global self-esteem and descriptive norm (2). Subjective norm was significantly related to anticipated regret, past behaviour and descriptive norm (2). Perceived behavioural control has strong relationships with anticipated regret, past behaviour and descriptive norm (1). Past behaviour strongly correlated with anticipated regret and descriptive norm (1). Descriptive norm (1) was strongly associated with anticipated regret and past behaviour. Descriptive norm (2) was only correlated with subjective norm, whereas outcome expectancy, conscientiousness and global self-esteem had no significant correlations with any other independent variables.

Table 5.1:1Means and Standard Deviations for variables in the New Zealand sample.

	Mean	Std. Deviation	Minimum	Maximum
Attitude	32.92	6.96	6	42
Subjective norm	5.77	1.69	1	7
Perceived behavioural control	17.43	4.25	3	21
Intention	13.46	5.67	3	21
Descriptive norm	9.88	2.25	3	14
Outcome expectancy	21.18	5.11	5	33
Anticipated regret	18.24	7.13	4	30
Conscientiousness	35.43	5.88	18	45
Global self-esteem	5.47	1.27	1	7

Table 5.1:2 Inter-correlations for the New Zealand sample

	Attitude	Subjective norm	Perceived behavioural control	Intention	Outcome expectancy	Anticipated regret	Conscientious-ness	Global self-esteem	Past behaviour	Descriptive norm (1)	Descriptive norm (2)
Attitude		.395*	.414*	.490*	.056	-.368*	.095	-.011	.425*	.275*	.171*
Subjective norm			.271*	.403*	-.002	-.450*	.077	-.026	.343*	.154	.247*
Perceived behavioural control				.695*	-.068	-.401*	.194*	.029	.468*	.288	.124
Intention					-.068	-.651*	.153	-.051	.520*	.278*	.137
Outcome expectancy						-.027	-.027	-.002	-.073	-.054	-.045
Anticipated regret							-.032	.077	-.377*	-.255*	-.134
Conscientiousness								.133	.114	.177*	-.027
Global self-esteem									-.008	.125	-.073
Past behaviour										.335*	.108
Descriptive norm (1)											.108

*p<.05,N=148

5.1.2 Regression: Assumptions

Variables attitude, subjective norm, perceived behavioural control, global self-esteem, past behaviour and descriptive norm (1) were found to have non-normal distributions, and significance tests for both skewness and kurtosis showed values above three. In order to improve the normality of these variables, data transformation were undertaken. Firstly, the Reflect of each variable was created to obtain a new score, and then recoded as a new variable. Square root transformations were subsequently applied to attitude, and global self-esteem; and logarithm transformations were applied to subjective norm, perceived behavioural control, past behaviour and descriptive norm (1). These transformations were recommended by Tabachnick and Fidell (1996) and improved the distributions for all five variables.

Detection of multivariate outliers and assessment of normality, linearity and homoscedasticity was carried out through an examination of the residuals from an initial standard regression analysis. Using Manhalanobis distance with $p<0.001$, no cases were identified as multivariate outliers from inspection of the critical value of chi square table ($x^2=10$) in Tabachnick and Fidell, (1996: Appendix C, Table C.4). One hundred-forty eight cases remained in the sample. The transformations improved skewness and kurtosis significance levels to show none above the recommend level of 3 (Tabachnick & Fidell, 1996). Plots of the standardized predicted and standardized residuals showed normality and linearity of the sample. The variance inflation factors are all fairly low and tolerance is high which also indicates absence of multicollinearity.

5.1.3 Hypothesis Testing

Hypothesis 1
The inter-correlations presented in Table 5:1:2 confirm the hypothesis that the theory of planned behaviour variables: attitude, subjective norm and perceived behavioural control would form a significant association with intention to use sunscreen.

Hypothesis 2
In order to confirm the hypothesis that the theory of planned behaviour plus the additional variables would predict intention to use sunscreen, a standard multiple regression analysis was conducted. Intention was used as the dependent variable. The theory of planned behaviour variables were entered into the regression equation simultaneously. As can be seen from Table 5:1:3, the correlation between the observed and predicted values was large (R = 0.75) which indicates that together attitude, subjective norm and perceived behavioural control have a strong relationship with intention. The adjusted R^2 indicates that *attitude, subjective norm* and *perceived behavioural control*, jointly explain about 54.8% of the variance in intention. The standard error of the estimate values, which were significant (F = 60.44, p< .05) indicate fewer errors in prediction. Table 5:1:3 shows perceived behavioural control had the greatest impact on intention (Beta = -.55, t = -8.82, p<. 05), followed by subjective norm (Beta = -.20, t = -3.34, p<. 05) and attitude (Beta = -.17, t = -2.66, p<. 05). All were significant.

Hypothesis 3
The correlations presented in Table 5:1:2 indicate that the additional variables anticipated regret, past behaviour and one of the descriptive norm items (1) were associated with intentions to use sunscreen. The remaining variables outcome-expectancy, self-esteem, conscientiousness and descriptive norm (2) were not significantly correlated with intention so not included in the regression.

Hypothesis 4
Following the above, the additional predictor variables, descriptive norm, past behaviour, anticipated regret, were entered into the regression equation simultaneously at step 2. As can be seen by Table 5:1:3, R had a large value (r = 0.83), indicating that together these additional independent variables have a strong

relationship with intention. The adjusted R^2 indicated that together these variables explain about 66.1% ($F = 29.69$, $p < .05$) of the variance in intention while controlling for any relationships between each other. This percentage also points out that by adding these variables into the equation, the predictive power the theory of planned behaviour is improved. Perceived behavioural control remained significant (Beta = -.43, t = -6.96), as did attitude (Beta = -.12, t = -2.09). Anticipated regret contributed significantly (Beta = -.37, t=-6.31) and past behaviour also made a significant contribution (Beta = -.1, t = -2.36). Subjective norm became a non-significant predictor (Beta = -.06, t = -.94). To sum up, the additional predictor variables explained an additional 11.3% of the variance in intention on top of attitude, subjective norm and perceived behavioural control.

Table 5.1:3Multiple Regression of Theory of Planned Behaviour and additional variables showing standardized regression coefficients, R, R^2, and adjusted R^2 for the New Zealand sample.

Predictor	Step 1 Beta	Step 2 Beta
Attitude	-.17*	-.12*
Subjective norm	-.20*	-.06
Perceived behavioural control	-.55*	-.43*
Anticipated regret	-	-.37*
Past behaviour	-	-.14*
Descriptive norm (1)	-	.06
R	.75	.83
R^2	.56	.68
Adjusted R^2	.55	.66
Durban Watson		1.97

p< .05 N=148 (all p-values 2-tailed)

Hypothesis 5

Assumptions: The Pearson's product-moment correlation coefficient indicated that implementation intention was significantly correlated with intention to use sunscreen. Implementation intentions satisfied all conditions of normality. Case number 81 was identified as a multivariate outlier but its removal from the sample did not alter the outcome of the original regression, so it remained in the sample.

Correlations: Implementation intention correlated significantly with intention at .84 ($p < .05$), which confirmed that implementation intentions were associated with intention to use sunscreen.

Hypothesis 6

An examination of the residuals of the standard multiple regression analysis conducted after implementation intention was added into the equation at step 2, showed case number 81 as a multi-variate outlier. The results of the regression analysis with this outlier removed did not differ considerably from the results with the outlier remaining. After analysis of the scores on all items for case 81 it was decided that it was representative of the target population. The decision was made to keep the outlier in the sample. All other assumptions were met.

The standard multiple regression analysis showed that implementation intentions contributed significantly to improving prediction when added to the attitude, subjective norm and perceived behavioural control model. Adding implementation intentions to the model explained an additional 18.8% of the variance in intention where the variables jointly explained 74.5% ($F=104.43$, $p<0.05$) of the variance in intention. Examining the beta values presented in Table 5:1:4 showed that implementation intentions was found to be a significant predictor in addition to the theory of planned behaviour variables. These findings provide support for the hypothesis that implementation intentions would add to the predictive power of the model.

Table 5.1:4 Standard Multiple Regression adding Implementation Intentions to the theory of planned behaviour in predicting intention to use sunscreen for the NZ sample.

Variable	Step 1	Step 2
	Beta	*Beta*
Attitude	-.17*	.10*
Subjective norm	-.20*	-.09
Perceived behavioural control	-.55*	-.20*
Implementation Intentions	-	.62*
R	.75	.86
R^2	.56	.75
Adjusted R^2	.55	.74
Durbin-Watson	-	1.89

p< .05 N=148 (all p-values 2-tailed)

Hypothesis 7

Mediation is evident if the effect of the independent variable on the dependent variable is reduced when the mediator is added to the equation (Gardner, 2001). The magnitude of this reduction indicates the degree of mediation. In order to test the mediation effect of implementation intentions on the relationship between the theory of planned behaviour and intention to use sunscreen the regression results in Table 5:1:4 were analysed. There is evidence of mediation in the perceived behavioural control-intention relationship, adding implementation intentions reduced *Beta* from .553 to .195. However as perceived behavioural control remained significant there is only partial mediation.

Hypothesis 8

The moderating effect of implementation intentions on the theory of planned behaviour-intention relationship was examined using a standard multiple regression analysis using intention as the dependent variable. The independent variables included were mean-centred before computing an interaction term in order to minimize multicollinearity problems and to assist in the interpretation of the nature of a significant interaction (Aiken & West, 1991). Each independent variable was mean centred by subtracting every score from the mean of that variable to form a new variable. These mean-centred variables were then each multiplied by past behaviour in order to create interaction terms, which would be used for the moderation analysis. The independent variables under consideration were entered in two blocks: (1) attitude, subjective norm, perceived behavioural control and implementation intentions, and (2) the interaction terms between each of attitude, subjective norm, perceived behavioural control with implementation intentions. A significant increase in the amount of variance explained when the interaction term is added to the regression equation (Aiken & West, 1991) would indicate that implementation intentions moderate the attitude-intention, subjective norm-intention and perceived behavioural control-intention relationship.

As shown in Table 5:1:5 the theory of planned behaviour and implementation intentions were able to explain 74.5% of the variance in intention to use sunscreen ($F = 104.43$, $p < .05$). The addition of the interaction term failed to produce a significant increase in the amount of variance explained in intention to use sunscreen (R^2 change = .00, F change = 45.17, $p < .05$) indicating that implementation intentions did not moderate the theory of planned behaviour-intention relationship for this sample.

Table 5.1:5 Moderating effect of implementation intentions on the theory of planned behaviour-intention relationship: standard multiple regression for the NZ sample

Predictor	Step 1	Step 2
	Beta	*Beta*
Attitude	-.10*	-.10
Subjective norm	-.09*	-.10
Perceived behavioural control	-.19*	-.19*
Implementation intentions	-.62*	.63*
Attitude x implementation intentions	-	-.06
Subjective norm x implementation intentions	-	.03
Perceived behavioural control x implementation intentions	-	.00
R	.86	.87
R^2	.75	.75
Adjusted R^2	.74	.74
Durbin Watson		1.80

*p< .05, N = 148

Hypothesis 9

Past behaviour was strongly and positively correlated with implementation intentions (Pearson's r = .476, p< .05). This supports the hypothesis that past behaviour and implementation intentions would be correlated. The strong positive correlation between past behaviour and implementation intentions indicated that scoring highly on past behaviour equated with scoring highly on implementation intentions.

Hypothesis 10

As noted in hypothesis 3, past behaviour was also correlated with intentions (r = .520, p< .05). Past behaviour explained 26.6% of the variance in intention. When implementation intention is added to this equation they jointly explained 71.6% of the variance in intention. The Beta for past behaviour at Step 1 is .520 and when implementation is added at Step 2 this reduces to .166, which shows evidence of mediation (See Table 5:1:6). However, it is only a partial mediating effect, past

behaviour still has an impact on intentions independently of the impact via implementation intentions.

Table 5.1:6 Mediation analysis of implementation intentions on the past behaviour-intention relationship showing standardized regression coefficients, R, R^2, and adjusted R^2 for the New Zealand sample.

Variable	Step 1 *Beta*	Step 2 *Beta*
Past Behaviour	.52*	.17*
Implementation Intentions	-	.76
R	.52	.85
R^2	.27	.72
Adjusted R^2	.27	.72
Durbin-Watson		1.95

*p< .05, N = 148

Hypothesis 11

This hypothesis was that past behaviour would affect intention via the theory of planned behaviour variables. A standard multiple regression was used entering attitude, subjective norm and perceived behavioural control in the first step and then past behaviour at the second. Results from Table 5:2:7 show that past behaviour was not mediated by the theory of planned behaviour constructs suggesting that past behaviour has an independent role. Adding past behaviour to the theory of planned behaviour explained an additional 2.2% of the variance in intentions.

Table 5.1:7 Mediation analysis of past behaviour on the theory of planned behaviour showing standardized regression coefficients, R, R^2, and adjusted R^2 for the NZ sample.

Variable	Step 1 *Beta*	Step 2 *Beta*
Attitude	-.17*	.15*
Subjective norm	-.20*	-.17*
Perceived behavioural control	-.55*	-.49*
Past behaviour	-	.17*
R	.75	.76
R^2	.56	.58
Adjusted R^2	.55	.57
Durban Watson		1.80

*p< .o5, N = 280

Hypothesis 12

The moderating effect of past behaviour on the theory of planned behaviour-intention relationship was also examined using a standard multiple regression analysis. As previously, the variables under consideration were entered in two blocks: (1) attitude, subjective norm, perceived behavioural control and past behaviour, and (2) the interaction terms between each of attitude, subjective norm and perceived behavioural control with past behaviour. As shown in table 5:1:8, the theory of planned behaviour and past behaviour were able to explain 57.9% of the variance in intention to use sunscreen (F = 49.19). The addition of the interaction term between the theory of planned behaviour variables and past behaviour did not produce a significant increase in the amount of variance explained in intention (R^2 change = .6, F change = 20.98) indicating no effect of moderation.

Table 5.1:8 Moderating effect of past behaviour on theory of planned behaviour-intention relationship: standard multiple regression analysis for NZ sample

Predictor	Step1 *Beta*	Step 2 *Beta*
Attitude	-.15*	-.16*
Subjective norm	-.17*	-.16*
Perceived behavioural control	-.49*	-.48*
Past behaviour	-.17*	-.19*
Attitude x past behaviour	-	.09
Subjective norm x past behaviour	-	-.01
Perceived behavioural control x past behaviour	-	-.05
R	.76	.77
R^2	.57	.59
Adjusted R^2	.57	.57
Durbin-Watson		1.90

*p< .05, N = 280

Hypothesis 13

Because conscientiousness was not correlated with intentions in this sample a mediation analysis of conscientiousness and past behaviour was not conducted.

5.2 UK Sample

5.2.1 Preliminary Analysis

A missing values analysis was conducted using SPSS and cases number 100 and 202 were deleted based on the information that they had more than thirty per cent of missing values. The remaining missing values across the data set were replaced with EM means calculated from the SPSS output.

Means and standard deviations are presented in Table 5:2:1. A comparison of means when taking into account minimum and maximum values indicates they are appropriate.

Table 5.2:1 Means and Standard Deviations for UK sample

Variable	Mean	Std. Deviation	Minimum	Maximum
Attitude	35.61	4.99	14	43
Subjective norm	5.99	1.65	1	7
Perceived behavioural control	18.31	3.85	3	21
Descriptive norm (1)	5.54	1.61	1	7
(2)	4.22	1.53	1	7
Intention	15.40	5.49	3	21
Anticipated regret	16.14	7.20	4	28
Global self-esteem	5.11	1.42	1	7
Implementation Intentions	13.64	4.21	3	17
Past behaviour	5.59	1.46	1	7
Conscientiousness	34.61	5.81	17	45
Outcome expectancy	25.89	5.66	8	35

Table 5:2:2 shows inter-correlations of the UK sample ($p < .05$) using Pearson's product-moment correlation (two-tailed) coefficient. Attitude, subjective-norm,

perceived behavioural control, descriptive norm (1), past behaviour, global self-esteem and conscientiousness are all correlated strongly and positively with intentions to use sunscreen. Anticipated regret is correlated strongly but negatively with intentions (r = -.526). Outcome expectancy is not correlated with intentions (r = -.095) and nor is descriptive norm (2) (r = .091). There were also a number of significant correlations between the independent variables. Attitude was correlated with all variables except global self-esteem and outcome expectancy. Subjective norm was significantly related to all variables as was perceived behavioural control, but not with outcome expectancy (r = -.007). The first descriptive norm item was significantly correlated with attitude, subjective norm, perceived behavioural control, and past behaviour and its corresponding descriptive norm item. The second item measuring descriptive norm was correlated with the theory of planned behaviour variables and also with anticipated regret. Anticpated regret was negatively correlated with all independent variables except descriptive norm (1), global self-esteem, conscientiousness and outcome expectancy. Global self-esteem was significantly correlated with subjective norm, perceived behavioural control, and conscientiousness. Past behaviour was correlated with all variables except the second descriptive norm item, global self-esteem and outcome expectancy. Outcome expectancy correlated only with subjective norm (r = .144).

Table 5.2:2 Inter-correlations for the UK sample

	Attitude	Subjective norm	Perceived behavioural control	Intention	Outcome expectancy	Anticipated regret	Conscien-tiousness	Global self-esteem	Past behaviour	Descriptive norm (1)	Descriptive norm (2)
Attitude		.316*	.363*	.416*	-.107	-.347*	.147*	-.018	.213*	.172*	.213
Subjective norm			.395*	.510*	.144*	-.413*	.177*	.146*	.327*	.125*	.175*
Perceived behavioural control				.551*	-.007	-.299*	.191*	.118*	.225*	.120*	.139*
Intention					-.095	-.526*	.232*	.130*	.414*	.157*	.091
Outcome expectancy						-.072	-.019	.073	.038	.017	.108
Anticipated regret							-.084	-.032	-.230*	-.117	-.123*
Conscientious-ness								.267*	.218*	.075	-.043
Global self-esteem									.060	.117	-.029
Past behaviour										.143*	.031
Descriptive norm (1)											.176*

P<.05

5.2.2 Regression: Assumptions

The variables attitude, subjective norm, perceived behavioural control, descriptive norm (1), intentions, global self-esteem and past behaviour were found to have non-normal distributions with significance tests for skewness and kurtosis showing values above 3. The reflect of each of these variables was calculated by adding 1 to the largest value of each variable to form a constant and then subtracting each score of the variable from this constant. Attitude, intention and global self-esteem showed moderate negative skewness so square root transformations were applied. Descriptive norm (1) and past behaviour showed substantial negative skewness and thus logarithm transformation were applied. Finally, subjective norm and perceived behavioural control had severe negative skewness so warranted inverse transformations, as recommended in Tabachnick and Fidell (1996). These transformations improved normality of all variables. The transformations improved skewness and kurtosis significance levels to show none above the recommend level of 3 (Tabachnick & Fidell, 1996).

An initial standard multiple regression was run using SPSS linear regression with intentions as the dependent variable. Detection of multivariate outliers was made through examination of the residuals. Using Manhalanobis distance with $p<0.001$, case number 243 was identified as a multivariate outlier from inspection of the critical value of chi square table ($x^2=10$) in Tabachnick and Fidell, (1996: Appendix C, Table C.4). It was decided to remove this case from the sample as its appearance may have distorted the results. Two hundred and eighty cases remained in the sample. Plots of the standardized predicted and standardized residuals showed normality and linearity of the sample. The variance inflation factors are all fairly low and tolerance is high which indicates absence of multicollinearity.

5.2.3 Hypothesis Testing

Hypothesis 1

Table 5:2:2 shows the inter-correlations that confirm the hypothesis that the theory of planned behaviour variables; attitude, subjective norm and perceived behavioural control would be significantly associated with intention to use sunscreen.

Hypothesis 2

A standard multiple regression was performed in order to assess the efficiency of the theory of planned behaviour variables in predicting intentions to use sunscreen. Attitude, subjective norm and perceived behavioural control were entered simultaneously as independent variables and intention was used as the dependent variable. The large correlation ($r = .628$) between observed and predicted values indicated that attitude, subjective norm and perceived behavioural control all had a strong relationship with intention to use sunscreen. Attitude, subjective norm and perceived behavioural control together explained about 39.5% of the variance in intention. There were few errors in prediction as indicated by the standard error of the estimate value ($F = 59.991$, $p < .05$). Perceived behavioural control had the greatest impact on intention (Beta = -.358, $t = -6.943$, $p < .05$), followed by subjective norm (Beta = -.261, $t = -5.023$, $p < .05$) and then attitude (Beta = .211, $t = 4.124$, $p < .05$). All were significant.

Table 5.2:3 Multiple regression for the theory of planned behaviour and additional variables on intention to use sunscreen for the UK sample

Predictor	Step *Beta*	Step 2 *Beta*
Attitude	.21*	.13*
Subjective norm	-.26*	-.13*
Perceived behavioural control	-.36*	-.28*
Anticipated regret	-	.27*
Conscientiousness	-	-.06
Global self-esteem	-	.02
Past behaviour	-	.16*
Descriptive norm (1)	-	.03
R	.63	.72
R^2	.40	.52
Adjusted R^2	.39	.50
Durban Watson		1.88

p< .05 N=148 (all p-values 2-tailed)

Hypothesis 3

The inter-correlations in table 5:2:2 showed additional variables added to the theory of planned behaviour model. Descriptive norm (1), anticipated regret, global self-esteem, past behaviour and conscientiousness were all significantly related to intention to use sunscreen. The remaining additional variables, descriptive norm (2) and outcome expectancy were not significantly correlated with intention so not included in the regression analysis.

Hypothesis 4

The additional variables were added into the regression equation simultaneously at step two. Table 5:2:3 shows that there is a strong linear relationship between the independent variables and intention when all are in the equation (R = .718). The adjusted R^2 indicates that together these variables explained about 51.6% (F = 28.704, $p < .05$) of the variance in intention. This is an improvement in the explained variance of the theory of planned behaviour. As can be seen from Table 5:2:3, when the additional variables are added into the regression equation, attitude (Beta = .126, t = 2.548), subjective norm (Beta = -.133, t = -2.561) and perceived behavioural control (Beta = -.277, t = -5.628) all remained significant predictors of intention. Of the additional variables added to the theory of planned behaviour model, anticipated regret (Beta = .269, t = 5.342) contributed the most to the prediction of intention to use sunscreen. Past behaviour made the next most significant contribution (Beta = .159, t = 3.375). These additional variables explained an additional 12.1% of the variance in intention to use sunscreen.

Hypothesis 5

Assumptions

The Pearson's product-moment correlation coefficient indicated that implementation intentions were significantly correlated with intention to use sunscreen. After conducting an initial regression and examining the residuals, implementation intentions was found to be moderately and negatively skewed. The reflect transformation of this variable was calculated and a square root transformation applied which improved the distribution. No multivariate outliers were found.

Correlations

Implementation Intentions correlated significantly with intention to use sunscreen (r = .813 ($p < .05$) which confirms this hypothesis.

Hypothesis 6

The standard multiple regression analysis showed that implementation intentions significantly added to the predictive power of the theory of planned behaviour model. Implementation intentions added an additional 24.1% of the variance in intention to use sunscreen, the variables jointly explaining 63.6% of the variance ($F = 120.331$, $p < .05$). As can be seen in Table 5:2:4 the Beta values indicate that adding implementation intentions contributed significantly in the prediction of intention to use sunscreen.

Table 5.2:4 Standard Multiple Regression adding Implementation Intentions to the theory of planned behaviour in predicting intention to use sunscreen for the UK sample.

Variable	Step1 *Beta*	Step 2 *Beta*
Attitude	.21*	.14*
Subjective norm	-.26*	-.07
Perceived behavioural control	-.36*	-.06
Implementation Intentions	-	.67*
R	.63	.80
R^2	.40	.64
Adjusted R^2	.39	.63
Durbin-Watson	-	1.77

*p< .05 N=148 (all p-values 2-tailed)

Table 5:2:4 shows that when implementation intentions are added to the regression equation subjective norm (Beta = -.065, t = -1.510) and perceived behavioural control (Beta = -.056, t = -1.212) are both reduced to non-significance. Attitude (Beta = .137, t = 3.414) remains a significant predictor and implementation intentions (Beta = .667, t = 13.52) then becomes the most significant predictor of intention to use sunscreen.

Hypothesis 7

In order to test the mediation effect of implementation intentions on the relationship between the theory of planned behaviour and intention to use sunscreen the regression results in table 5:2:4 were considered. Implementation intentions mediated the subjective norm-intention relationship (Beta = -.065) and also the perceived behavioural control-intention relationship (Beta = .056) by reducing them to non-significance. There is only partial mediation for the attitude-intention relationship (Beta = .137), which is still significant.

Hypothesis 8

The moderation effects of implementation intentions on the theory of planned behaviour-intention relationship were tested with the same method as the New Zealand sample. As shown in Table 5:2:5 the theory of planned behaviour and implementation intentions were able to explain 39.5% of the variance in intention to use sunscreen ($F = 59.99$, $p < .05$). The addition of the interaction term failed to produce a significant increase in the amount of variance explained in intention to use sunscreen (R^2 change = .09, F change = 29.21, $p < .05$) indicating that implementation intentions did not moderate the theory of planned behaviour-intention relationship.

Table 5.2:5Moderating effect of implementation intentions on the theory of planned behaviour-intention relationship: standard multiple regression for the UK sample

Predictor	Step 1 *Beta*	Step 2 *Beta*
Attitude	.21*	.13
Subjective norm	.26*	-.24*
Perceived behavioural control	.36*	-.35*
Implementation intentions	-	.67*
Attitude x implementation intentions	-	-.11
Subjective norm x implementation intentions	-	-.06
Perceived behavioural control x implementation intentions	-	-.03
R	.63	.64
R^2	.40	.40
Adjusted R^2	.39	.39
Durbin-Watson		1.89

*p< .05, N = 280

Hypothesis 9

Pearsons's product moment inter-correlations were calculated to confirm the relationship between past behaviour and implementation intentions. Past behaviour was strongly and positively correlated with implementation intentions ($r = .619$, $p < .05$).

Hypothesis 10

The mediating effect of past behaviour on the implementation intention-intention relationship was examined using a standard multiple regression analysis. The variables of analysis were entered in two blocks: (1) implementation intentions (2) past behaviour. The beta values shown in Table 5:2:6 indicate that past behaviour did not mediate the implementation intention-intention relationship, past behaviour did not have an affect on intentions via implementation intentions.

Table 5.2:6 Mediation analysis of implementation intentions on the past behaviour-intention relationship showing standardized regression coefficients, R, R^2, and adjusted R^2 for the UK sample.

Variable	Step 1 *Beta*	Step 2 *Beta*
Implementation intentions	.78*	.74*
Past behaviour	-	.11*
R	.78	.79
R^2	.61	.62
Adjusted R^2	.61	.62
Durban Watson		1.77

*p< .o5, N = 280

Hypothesis 11

This hypothesis was that past behaviour would affect intention via the theory of planned behaviour variables. A standard multiple regression was used entering attitude, subjective norm and perceived behavioural control in the first step and then past behaviour at the second. Results from Table 5:2:7 show that past behaviour was not mediated by the theory of planned behaviour constructs suggesting that past behaviour has an independent role. Adding past behaviour to the theory of planned behaviour explained an additional 3.3% of the variance in intentions.

Table 5.2:7 Mediation analysis of past behaviour on the theory of planned behaviour showing standardized regression coefficients, R, R^2, and adjusted R^2 for the UK sample.

Variable	Step 1 *Beta*	Step 2 *Beta*
Attitude	.21*	.18*
Subjective norm	-.26*	-.23*
Perceived behavioural control	-.36*	-.32*
Past behaviour	-	.20*
R	.63	.65
R^2	.40	.43
Adjusted R^2	.39	.42
Durban Watson		1.9

*p< .o5, N = 280

Hypothesis 12

The moderating effect of past behaviour on the theory of planned behaviour-intention relationship was also examined using a standard multiple regression analysis. As before, the variables under consideration were entered in two blocks: (1) attitude, subjective norm, perceived behavioural control and past behaviour, and (2) the interaction terms between each of attitude, subjective norm and perceived behavioural control with past behaviour. As shown in table 5:2:8, the theory of planned behaviour and past behaviour were able to explain 42.8% of the variance in intention to use sunscreen (F = 51.43). The addition of the interaction term between the theory of planned behaviour variables and past behaviour did not produce a significant increase in the amount of variance explained in intention (R^2 change = .015, F change = 20.57) indicating no effect of moderation. However there was a partial moderation effect of past behaviour on the perceived behavioural control-intention relationship.

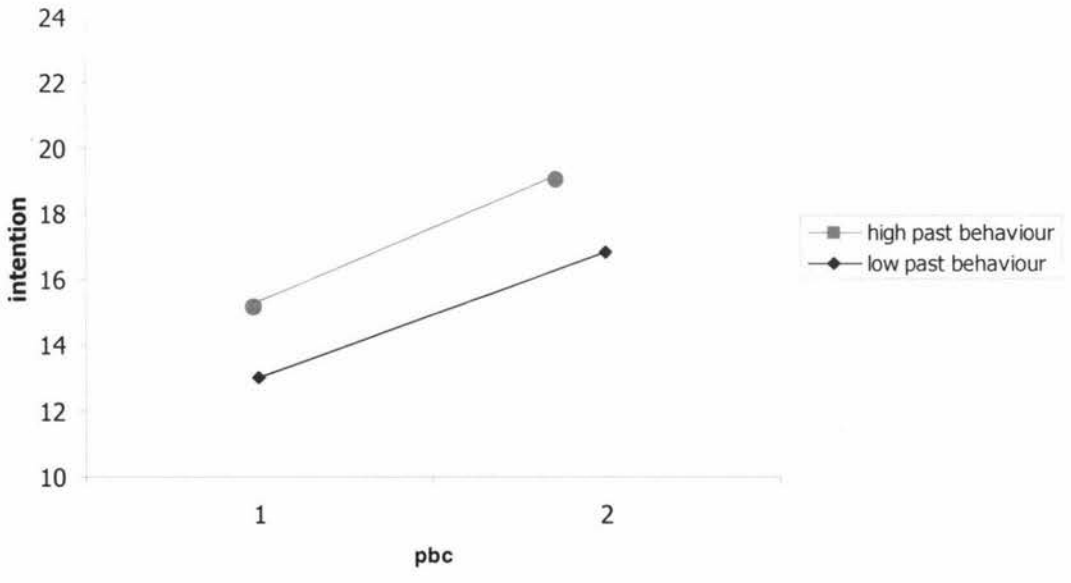
Table 5.2:8 Moderating effect of past behaviour on theory of planned behaviour-intention relationship: standard multiple regression analysis for UK sample

Predictor	Step1 *Beta*	Step 2 *Beta*
Attitude	.18*	.19*
Subjective norm	-.23*	-.21*
Perceived behavioural control	-.32*	-.32
Past behaviour	.20*	.20*
Attitude x past behaviour	-	.08
Subjective norm x past behaviour	-	-.08
Perceived behavioural control x past behaviour	-	.10*
R	.65	.67
R^2	.43	.44
Adjusted R^2	.42	.43
Durbin-Watson	1.89	

*p< .05, N = 280

Figure 5 shows how the relationship between perceived behavioural control and intention varies as a function of past behaviour. When the frequency of past behaviour is high, perceived behavioural control predicts intentions, and when the frequency of past behaviour is low, perceived behavioural control can also predict intentions but not so strongly. There is no interaction since the pattern of results is the same for both levels of past behaviour – the lines are parallel.

Figure 5 Moderation of past behaviour and perceived behavioural control on intention to use sunscreen



Hypothesis 13

There was a strong positive correlation between conscientiousness and past behaviour ($r = .218$, $p < .05$). In order to assess the mediation effect of conscientiousness on the past behaviour-intention relationship a standard multiple regression was performed by entering the variables under consideration in two blocks, with intention as the dependent variable: (1) past behaviour (2) conscientiousness. As shown in Table 5:2:9 adding conscientiousness to the past behaviour-intention relationship did not reduce it to non-significance, thus there was no evidence of mediation.

Table 5.2:9 Mediation effect of conscientiousness on past behaviour-intention relationship for UK sample: standard multiple regression analysis

Variable	Step 1 Beta	Step 2 Beta
Past behaviour	.42*	.38*
Conscientiousness	-	-.16*
R	.42	.44
R^2	.17	.19
Adjusted R^2	.17	.19
Durban Watson	-	1.73

6 DISCUSSION

The present study sought to apply the theory of planned behaviour to the prediction of intention to use sunscreen among beachgoers. The initial hypothesis, derived from that of Jones et al. (2001), was that the variables of attitude, subjective norm and perceived behavioural control would together predict intention to use sunscreen. The current study also explored additional variables, which have been evidenced as useful in predicting other health related behaviours when used in conjunction with the theory of planned behaviour. The fourth hypothesis sought to find which of descriptive norm, anticipated regret, past behaviour, conscientiousness, outcome expectancy, global self-esteem and implementation intentions contributed to successfully predicting intention to use sunscreen. It was further hypothesised that implementation intentions would mediate both the relationship between the theory of planned behaviour and intention and also the relationship between past behaviour and intention. Mediation was also expected between the past behaviour and intention relationship by conscientiousness. This study examined the interaction effects between implementation intentions and the theory of planned behaviour constructs and between past behaviour and the theory of planned behaviour constructs in predicting intention to use sunscreen.

The Theory of Planned Behaviour

The first hypothesis (Ajzen, 1988, 1991,in Jones et al. 2001) was that the theory of planned behaviour would be associated with intention to use sunscreen. This hypothesis was supported in that the variables attitude, subjective norm and perceived behavioural control were all strongly related to intention to use sunscreen in both the New Zealand sample and the United Kingdom sample. This finding is congruent to Ajzen's (1988) original idea that attitudes, norms and perceived behavioural control are related to an individual's health-related behavioural intention.

It was further hypothesised that the theory of planned behaviour variables would be significant predictors of intention to use sunscreen. Overall this hypothesis was confirmed in both the NZ and UK samples with the constructs explaining 54.8% and 39.5% (respectively) of the variance in intention scores. These findings offered a

general support for the efficacy of the theory of planned behaviour. The results were also in line with the findings by Armitage and Conner (2001) and Hillhouse et al. (1997, in Jones et. al, 2001), who affirmed that the theory of planned behaviour components accounted for 39% and 37% (respectively) of the variance in behavioural intentions.

In both the NZ and UK samples, perceived behavioural control was the most significant predictor of intention to use sunscreen (NZ Beta = -.553, UK Beta = -.358). This can be related back to findings by Godin and Kok (1996), where perceived behavioural control added a mean 13% of the explained variance in intention above attitude and subjective norm, and also in findings by Armitage and Conner (2001) who found perceived behavioural control explained a further 6% of the variance in intention.

Unlike Armitage and Conner's (2001) findings that subjective norm is the weakest predictor (of the theory of planned behaviour variables) of intention; the current study showed attitude as the weakest predictor of intention, and not subjective norm (subjective norm NZ Beta =-.203, UK Beta = -.261). Armitage and Conner (2001) have suggested that the weak power of subjective norm in predicting intention is explained by most studies as being a result of using only a single item to measure this construct, which usually results in low reliability of the measure. The single-item measure of subjective norm in this study does not appear to have impaired its performance. However, in light of previous studies explaining the general weakness of subjective norm, studies using social identity and self-categorization theories have established that a person's identification with a group linked to a common behaviour can moderate the effect of norms of that group on the behaviour (Terry & Hogg, 1996). Further investigation into the role of subjective norms could encompass social-identity concepts within the group of beachgoers.

Additional Variables

Descriptive norm: The results of the current study showed that one (of the two) measure of descriptive norm was related to intention to use sunscreen. However the concept of descriptive norm, together with other concepts that were added to the theory of planned behaviour, was not able to contribute anything significant on its own over

and above the theory of planned behaviour in the prediction of intention to use sunscreen. This is contrary to what Sheeran and Orbell (1999) found where descriptive norm contributed both significantly and independently to the prediction of health-related behaviours using the theory of planned behaviour.

Outcome expectancy and the importance of tan to self-esteem: The current findings show that the presumed normal consequences of behaviour, or outcome expectancies, do not appear to be a factor in forming intentions to use sunscreen amongst beach-goers in both New Zealand and United Kingdom populations. Outcome expectancy did not correlate with intention to use sunscreen. This is dissimilar to previous research that has found outcome expectancy to be both correlated with, and predictive of health-related behaviours, for example, Bowen et al. (2001) who found outcome expectancy to be a strong predictor of crack cocaine users intentions to use condoms. As Prochaska et al. (1992) note, positive outcome expectancies increase as the pre-contemplation stage progresses. It may be that this stage of intention formation (or the pre-contemplation stage) corresponds to a decrease in negative outcome expectancies, resulting in low, or no correlation between outcome expectancy and intention. Further clarification of this suggestion could be investigated in future studies by exploring outcome expectancies and where they sit in the pre-contemplation stage of sunscreen use.

Implementation Intentions: In response to Jones et al.'s (2001) suggestions regarding the formation of plans, investigation of the role of implementation intentions was undertaken. The current findings show that implementation intentions are related to intention to use sunscreen. Implementation intentions are also a significant predictor of intention in addition to the theory of planned behaviour constructs, contributing an additional 18.8% and 24.1% of the explained variance in intention in both NZ and the UK, respectively. This is in line with Gollwitzer's (1999) supposition that implementation intentions can boost behavioural intentions, which in turn should indicate that target behaviours will be more likely to be carried out. The results of the present study also match previous studies that have tested the effects of implementation intentions, for example, Orbell et al. (1997) who found that implementation intentions increased the power of the theory of planned behaviour in improving the rates of breast self-examination by women. Abraham et al, (1999) attempted to distinguish between people who intend to use condoms that actually do use condoms and those who intend

to use but in reality do not. It was found that measures of prior planning, or implementation intentions, successfully discriminated between these to groups of users and non-users, improving the predictive power of intention measures used alone (Abraham, et. al., 1999). They suggest that future research could be directed toward mapping goal organization to appropriate situations where target behaviours were to be enacted. This suggestion has been successfully implemented in the present study by measuring implementation of sunscreen use intentions in the behavioural situation – on the beach.

Implementation intentions were found to affect intention partially thorough the theory of planned behaviour constructs among New Zealand beach-goers, and through subjective norm and perceived behavioural control but not via attitude among British beach-goers. Implementation intentions did not interact with any of the theory of planned behaviour constructs in predicting intention.

The results of the present study found that implementation intentions were also strongly related to past use of sunscreen. However, in both samples, past behaviour was found to have an effect on intention to use sunscreen independently of implementation intentions, although in the NZ sample a partial effect was found between past behaviour and intention, via implementation intentions.

The current findings regarding the interaction effects of implementation intentions and past behaviour are in agreement with previous research showing that implementation intentions have an indirect effect on the target behaviour via heightening of the concept of perceived self-efficacy, or perceived behavioural control (Schwarzer, 1992). For example, dividing a task into a series of smaller sub-tasks, like setting a time or place, for the task to be accomplished can lead to higher feelings of self-efficacy when embarking on the task, at completion of the various stages of sub-tasks and also at overall task completion (Stock & Cervone, 1990). Stock & Cervone's (1990) findings are similar to the findings of the current study where using implementation intentions have lead to intention formation via higher feelings of perceived control over the target behaviour of sunscreen use.

Past behaviour: The concept of past behaviour showed a strong positive relationship with intention to use sunscreen in both samples and contributed significantly, albeit a small percent, together with the other additional constructs to the theory of planned behaviour in the prediction of intention to use sunscreen. The direct correlation of past behaviour with intention is in line with similar findings over two studies by Conner and Abraham (2001) that found past behaviour to be a significant predictor of health protection and exercise. The findings of the present study found that past behaviour's effect on intentions was not mediated by the theory of planned behaviour variables, this is contrary to Conner and Abraham (2001) who found past behaviour affected intention via the theory of planned behaviour constructs.

Aarts, Verplanken and van Knippenbeg (1998) implied that further research on the role of past behaviour or habit, may reveal moderating effects with the theory of planned behaviour. With respect to the results of the current study, the strength of the relationship between attitude, subjective norm and perceived behavioural control and intention to use sunscreen did not alter as the frequency of past behaviour varied. Conversely in the UK sample only, there was evidence of a partial interaction effect, with the construct of perceived behavioural control. Perceived behavioural control rose as the frequency of past behaviour increased (see Figure 5). This is similar to Norman et al., (2000), where a strong interaction effect with the theory of planned behaviour was found in predicting exercise intentions.

Anticipated regret: Interesting to note is the strong negative correlation of anticipated regret with intention. This is intriguing because it disconfirms the hypothesis that anticipated regret is positively related to intention to use sunscreen. In sum, beach-goers don't experience feelings of regret if they fail to use sunscreen but they still intend to use it. In both the NZ and UK samples the concept of anticipated regret contributed significantly to the prediction of intention. Furthermore, the role of anticipated regret increased somewhat in importance in the NZ sample where, together with the other additional constructs it reduced the predictive power of subjective norm to non-significance. This shows anticipated regret is a strong predictor and when evident reduces subjective norms ability to predict intention to use sunscreen.

Together with previous research on the concept of anticipated regret (e.g., Richard et al., 1998) the current findings suggest that anticipated affective reactions are an important predictor of intentions. Parker, Manstead and Stradling (1995) found that anticipated affective reactions accounted for a significant proportion of the variance in intentions over and above the theory of planned behaviour constructs. Because anticipated regret is strongly but negatively correlated with intention to use sunscreen, further investigation of the effects of anticipated regret including possible mediating or moderating effects would give a clearer picture of its contribution to the theory of planned behaviour. Orbell and Sheeran (1999) have made similar suggestions this after investigating the role of anticipated regret and descriptive norm in predicting health behaviour.

Conscientiousness: The personality trait of conscientiousness only related to intention to use sunscreen in the UK sample. It appears that among beach goers in New Zealand, identifying as a conscientious person is not related to an intention to use sunscreen, but it is a factor among those on British beaches. However, among the UK sunbathers, the trait of conscientiousness while being related to intention to use sunscreen, does not contribute to the predictive power of the theory of planned behaviour. The findings of this study are in contrast to suggestions by Conner and Abraham (2001) and Castle et al., (1999) that conscientiousness may have an independent role over and above the theory of planned behaviour constructs. It is also dissimilar to the findings of Ingledew and Brunning (1999) who found conscientiousness to be a significant predictor of preventive health behaviour.

Conner and Abraham (2001) have outlined that conscientiousness would have a mediating affect on the relationship between past behaviour and the theory of planned behaviour variables. The results of the present study found no evidence to support Conner and Abraham's (2001) study, conscientiousness did not effect intention to use sunscreen based on past sunscreen use. Conscientiousness is a personality trait that has been found to be stable over time (Allport and Odhert, 1936) and the cognitions of attitude, subjective norm and perceived behavioural control are changeable. It follows that interventions may be more affective by focusing on cognitions that can be changed. However, in light of Ingledew and Brunning's (1999) findings about the interaction effects of conscientiousness, further exploration of this variable might prove fruitful.

Global self-esteem: Self-esteem among beachgoers in the United Kingdom is related to intention to use sunscreen but it did not improve prediction power of the theory of planned behaviour. Among New Zealand beach-goers, feelings of self-esteem are not a factor in forming intentions to use sunscreen. These current findings are congruent to previous research that found no, or only a small relationship between self-esteem and behavioural intention (e.g., McGee & Williams, 2000; Davis, Johnson, Miller-Cribbs, and Saunders 2002; Brewer & Baldwin, 2000). Because sunscreen was correlated with intentions to use sunscreen in the UK sample, further investigation might to consider the relationship between self-esteem and a behavioural measure.

6.1 STRENGTHS, LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

One notable feature from the present study was that during data collection, immediately after questionnaires were completed, a large amount of respondents on the New Zealand beaches were seen by researchers to be applying sunscreen. Whether this was a result of the questionnaire on its own acting as an intervention is only speculative but suggests that raising awareness and providing information in the behavioural setting, could be effective intervention. Design of sunscreen promotional campaigns might focus on using interventions, for example prominently displayed billboards or distribution of leaflets at the beach where the target group is most likely to be applying, or intending to apply sunscreen.

The measure of behavioural intention was used as an alternate measure of behaviour, and given that 47% of people who form intentions fail to act upon them (Sheeran, 2002), measuring actual behaviour in conjunction with intention measurement, could afford a more accurate representation of sunscreen use. The theory of planned behaviour does not consider the translation of intentions into action, the maintenance of behaviours subsequent to performance nor prevention of relapse, as Schwarzer (1992) suggests is necessary for effective behavioural change. In future, questionnaires pertaining to sunscreen use, ought to implement specific questions about intention as well as behaviour.

The major shortcoming of the present study was the time of year of data collection for the New Zealand sample. Data was gathered in March and April, the end of the summer period for southern hemisphere countries. While the weather on the beaches at Mt Maunganui was still hot enough for sunbathing many of the respondents commented that the sun was no longer strong enough to burn their skin and accordingly had not applied sunscreen. Future data collection involving sunscreen use and/or intentions should heed this shortcoming and recruit respondents at the height of summer in late January to February.

Possible limitations concerning the measures used in this study should also be observed. To begin with, it has been noted among several authors about the susceptibility to bias of self-report measures. Furthermore, earlier research (e.g., Budd, 1987, Sheeran & Orbell, 1996; Armitage & Conner, 1999) has questioned the role of structured versus random questionnaire format on the reliability and validity of various social cognition models. Armitage and Conner (1999) found that questionnaire format had only a moderate impact on the relationships between the components of the theory of planned behaviour. In line with these findings, the present study found strong internal reliability across all measures. One exception to the strong reliability of the questionnaire constructs was the combination of the two descriptive norm items, which were kept separate in the current study in order to maintain reliability. Further investigation into the formation of questions relating to descriptive norm may improve reliability of combinations of items in formation of a construct. This may in turn enhance the predictive power of descriptive norm.

As outlined earlier, the results of the current study indicate that anticipated regret was the most significant predictor of intention to use sunscreen. It follows that prospective explorations attempting to increase sunscreen use would benefit from including the concept of anticipated regret. Including affective emotions in assisting construction of models of sunscreen use has also been proposed in previous research recommendations (e.g., Kiesling & Friedman, 1987; Jones, et al. 2001).

Because of criticisms about the subjective norm component of the theory of planned behaviour (e.g., Conner and Armitage 1999) possible investigation into the role of the normative component of self-identity may be useful. Sparks and Sheppard (1992)

define self-identity as the extent to which an individual perceives themselves as fulfilling a particular social role and this perception, if strong, will influence behavioural intention. In investigating how the theory of planned behaviour could be improved by using the concept of self-identity to predict food choices, Armitage and Conner (1999) found that self-identity contributed an additional 4% of variance in intention once the theory of planned behaviour variables had been accounted. Self-identity was shown as an independent predictor, thus representing a useful addition to social cognition models. It follows that further inquiries might include self-identity as an alternative or additional normative component to add to the theory of planned behaviour across other health-related behaviours (Armitage and Conner, 1999), notably sunscreen behaviour.

An interesting and slightly concerning trend was discovered by the researchers on Mt Maunganui beaches, where sun-bathers (generally New Zealander's) reported that they did not use sunscreen because they believed that sunscreen contained harmful ingredients that would be more detrimental to their health than excessive sun-exposure. Burke (1999) has highlighted the recent controversy surrounding the use of sunscreen where some epidemiologists argued that sunscreen use might actually increase the risk of melanoma. Also Burke (1999) points out that some researchers have identified using sunscreen to encourage people to stay out in the sun for longer periods if time. However, sunscreens have been shown to protect against all adverse effects of the sun (Burke, 1999). Previous epidemiological studies regarding melanoma and sunscreen use have found that sunscreen is often used inadequately with regards to amount and SPF used and when it is applied in relation to going out in the sun (Bastuji-Garin & Diepgen, 2002). The Australian and New Zealand Sunscreen Products – Evaluation and Classification (AS 2604 1983) has emphasised that sunscreens filter out varying amounts of sunburning radiation and decreases the amount of sunburning over time if re-applied regularly. Kirke and Wilson (2000) report poor understanding of SPFs among South Australians with responses suggesting that overall many people do not know how much protection sunscreens provide. Kirke and Wilson (2000) advise that education about the value of sunscreens and their SPF is necessary, and the current research supports this suggestion.

6.2 CONCLUSION

In conclusion, the results of the present study support the utility of using social cognitive models in the prediction of sunscreen use. In particular, the present research suggests that the theory of planned behaviour can be usefully applied to predict intention to use sunscreen amongst beach-goers. Additionally, results have shown that the model can be usefully extended to include concepts of past behaviour, anticipated regret, and implementation intentions as predictors of intention. Previously having used sunscreen is independently related to sunscreen use intention, and partially interacts with perceived control over applying sunscreen. Forming a specific plan about how to go about using sunscreen has an affect on intention only when attitude toward sunscreen, perceptions of others views toward sunscreen, and perceived control over the use of sunscreen are positive. Being a conscientious person is related to intention to use sunscreen among beachgoers in Britain, but further investigation is required about this personality trait among the New Zealand population. The success of the present study will be useful in the future design of sunscreen use interventions and sunscreen promotional campaigns that might also include behavioural measures.

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APPENDICES

APPENDIX A: INFORMATION SHEET - NZ

Sunscreen Use Among New Zealand Beach Goers

Information Sheet

Our names are Tessa Neil and Katharine Mills, and although you may only meet one of us on the beach, we are postgraduate students at Massey University, currently researching the area of sunscreen use among beach goers. Our supervisor is Christine Stephens, a lecturer in the School of Psychology at Massey University, whose contact details are below.

You are asked to complete a short questionnaire, read a short extract, view two pictures and answer a few easy questions on this. This should take you no more than ten minutes.

The information obtained from your questionnaire will be used for the completion of our thesis projects, publications in academic journals, and possibly used to help advance sunscreen interventions. If you are interested in these results, we will send you a summary if you complete the request form included with the questionnaire. This request form will be stored separately from the questionnaire as soon as we receive it and the record will be destroyed once we have sent you the information. These sheets will be kept in locked filing cabinet, until the research has concluded.

Your name and contact details do not appear on any part of the questionnaire, so confidentiality and anonymity are guaranteed. The questionnaires will only be viewed by the researchers. At the conclusion of the study all questionnaires will be destroyed.

You have the right to decline to participate in this research, the right to refuse to answer any question in the questionnaire, and are able to withdraw from the study while completing the questionnaire. You have the right to ask any questions about the study at any time during participation and are assured confidentiality and anonymity.

If you would like any further information or have any questions about the study please do not hesitate to contact Christine Stephens at the address above or phone us at 06 350 5799 ext. 2071.

Yours sincerely

Dr Christine Stephens Tessa Neil Katharine Mills

APPENDIX B: PRE-INTERVENTION

On the beach.....

Please answer the following questions honestly. Remember this is not a test of any sort - it is just about what you think and do.

What is your age? (put one number in each box) ❒❒

Are you (tick one) Male ❒ Female ❒

What is your nationality?_____

Using a sunscreen on the beach today would be:(circle one number per line)

a) Bad	1	2	3	4	5	6	7	**Good**
b) Harmful	1	2	3	4	5	6	7	**Beneficial**
c) Unpleasant	1	2	3	4	5	6	7	**Pleasant**
d) Unenjoyable	1	2	3	4	5	6	7	**Enjoyable**
e) Risky	1	2	3	4	5	6	7	**Safe**
f) Reassuring	1	2	3	4	5	6	7	**Troubling**

Do you think people of your age and sex think they should use sunscreen when on the beach? (circle a number to show how much you agree or disagree with this statement)

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

I intend to use sunscreen on the beach today.

strongly disagree 1 2 3 4 5 6 7 **strongly agree**

For me to use sunscreen when on the beach today would be:

difficult **intermediate** **easy**

1 2 3 4 5 6 7

I have high self-esteem.

not very true of me 1 2 3 4 5 6 7 **very true of me**

People who are important to me think I should use sunscreen when on the beach today.

unlikely 1 2 3 4 5 6 7 **likely**

Sun tanned people do not look more attractive.

strongly disagree 1 2 3 4 5 6 7 **strongly agree**

How much control do you have over whether you use sunscreen when on the beach today?

no control **intermediate** **complete control**

1 2 3 4 5 6 7

I look slimmer when I have a tan.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I will try to re-apply my sunscreen often enough to ensure adequate protection on the beach today.

likely 1 2 3 4 5 6 7 unlikely

Most people on the beach today will be using use sunscreen.

strongly disagree 1 2 3 4 5 6 7 strongly agree

Having a tan helps me feel better about myself.

strongly disagree 1 2 3 4 5 6 7 strongly agree

Had you thought about the following before coming to the beach today?

(tick one box in each row)

	had not occurred to me	had not thought about it	had occurred to me	had an idea about how to do this	had a clear plan how to do this
taking sunscreen to the beach					
putting sunscreen on regularly on the beach					

For me to use sunscreen often enough to ensure adequate protection today would be:

difficult **intermediate** **easy**

1 2 3 4 5 6 7

I intend to re-apply my sunscreen often enough to ensure adequate protection on the beach today.

strongly disagree 1 2 3 4 5 6 7 strongly agree

Having a sun tan makes people look healthier.

strongly disagree 1 2 3 4 5 6 7 strongly agree

I am more attractive when I have a tan?

strongly disagree 1 2 3 4 5 6 7 strongly agree

I plan to use sunscreen on the beach today.

strongly disagree 1 2 3 4 5 6 7 strongly agree

In the past, how often did you use sunscreen when on a beach?

never	almost never	a few times	Some times	several times	quite often	all the time

How would you feel later if you did <u>not</u> use sunscreen on the beach today?

(circle a number in each row)

a) worried	1	2	3	4	5	6	7	**not worried**
b) regret	1	2	3	4	5	6	7	**no regret**
c) tense	1	2	3	4	5	6	7	**relaxed**
d) upset	1	2	3	4	5	6	7	**no upset**

APPENDIX C: POST INTERVENTION QUESTIONS

Please answer the next questions by ticking a box for each statement which best represents the extent of your agreement or disagreement with the statement. (*Tick one box in each case*)

	DISAGREE STRONGLY	DISAGREE A LITTLE	NEITHER AGREE OR DISAGREE	AGREE A LITTLE	AGREE STRONGLY
I see myself as someone who….					
41) does a thorough job	❒	❒	❒	❒	❒
42) can be somewhat careless	❒	❒	❒	❒	❒
43) is a reliable worker	❒	❒	❒	❒	❒
44) tends to be disorganised	❒	❒	❒	❒	❒
45) tends to be lazy	❒	❒	❒	❒	❒
46) perseveres until the task is finished	❒	❒	❒	❒	❒
47) does things efficiently	❒	❒	❒	❒	❒
49) is easily distracted	❒	❒	❒	❒	❒

Just a few more questions……..

What is your natural hair colour? (tick one box)

black ❒ brown ❒ light brown ❒ blond or fair ❒ red ❒

How easily does your skin get sunburnt? (that is, reddening of the skin from being in the sun that is still there the next day).

easily 1 2 3 4 5 6 7 not at all easily

APPENDIX D: SUN EXPOSURE LEAFLET

Early detection of skin cancer leads to a cure in 99% of cases.

APPENDIX E: INFORMATION LEAFLET – UK

Cancerlink

Cancer Information Helpline
Freephone 0808 800 0000
http://www.cancerlink.org

BACUP (British Association of Cancer United Patients)

Cancer Information Service
Freephone 0808 800 1234
http://www.cancerbacup.org.uk

Skin Safety Information Website

http://www.thesite.org/festivals/sun_safety.html

BBC Health Information website

http://search.bbc.co.uk/health/conditions

APPENDIX F: FEEDBACK REQUEST FORM

Please send me a summary of the results at the conclusion of the sunscreen use study:

Name: _____

Address: _____

_____

_____