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Smoking : An exploration of message framing and death anxiety

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SMOKING: AN EXPLORATION OF MESSAGE FRAMING AND DEATH ANXIETY

by

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1 November, 1999

This thesis submitted in partial fulfilment of the requirements for the award of Bachelor of Health Science with Honours at the Faculty of Health and Human Services, Edith Cowan University.

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Abstract

The focus of this thesis is the replication and extension of research by Tversky and Kahneman (1981) who found that how a message is worded or framed can significantly affect decisional choice. Tversky and Kahneman (1981) demonstrated that a message framed in terms of “lives saved” was favoured over one which read “lives lost” notwithstanding that the net sum of survivors was equal in both instances. The authors referred to the effects of message framing on decision making as Prospect Theory. This thesis studied Tversky and Kahneman’s (1981) research applied to the issue of smoking. The preference for a positive frame over a negative frame is hypothesised to be linked to death anxiety whereby saved lives elicits a lesser expression of death anxiety. Relative to decision making death anxiety might act as a function in the decision frame choice. Convenience samples of university students were assigned to either a positive or negative message frame treatment. Data support the hypothesis in Experiment 2 for female participants assigned to a negative frame who were smokers, and in Experiment 3 for female participants assigned to a positive frame who were smokers. These findings show that there is a complex relationship between smokers’ and non-smokers’ self rated death anxiety scores.

Results were interpreted with 2-way chi-square tests and 3-way ANOVA. Findings from this study lend support to Tversky and Kahneman’s (1981) explanation of self-control as a function in the reversal of preference phenomenon and add an original contribution to the health promotion, social and communication sciences, particularly for the decision making and message framing literature.

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Date

..... 1/11/1999

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Table of Contents

<i>ABSTRACT</i>	<i>II</i>
<i>DECLARATION</i>	<i>III</i>
<i>ACKNOWLEDGMENTS</i>	<i>IV</i>
<i>LIST OF TABLES</i>	<i>VIII</i>
<i>LIST OF FIGURES</i>	<i>IX</i>
<i>INTRODUCTION</i>	<i>1</i>
BACKGROUND TO THE STUDY	1
SIGNIFICANCE OF THE RESEARCH.....	6
RATIONALE OF THE RESEARCH	7
TERMS OF THE RESEARCH.....	9
Research Objectives	9
Research Questions	9
Research Hypotheses	10
OPERATIONAL DEFINITIONS	11
Death Anxiety.....	11
Decision Frame.....	11
Negative Frame.....	11
Positive Frame	11
Risky seeking.....	11
Sure-thing	11
SUMMARY.....	11
<i>REVIEW OF THE LITERATURE</i>	<i>13</i>
INTRODUCTION	13
Australian Anti-smoking Health Promotion.....	13
Research on Anti-smoking Health Promotion	15
Tobacco Smoking As A Priority Area For Health Promotion.....	16
Health Promotion Message Framing And Decision Making.....	18
Death Anxiety As A Potential Factor	23
Common Uses Of Prospect Theory	25

<i>THEORETICAL FRAMEWORK</i>	28
MESSAGE FRAMING AND PROSPECT THEORY	29
MESSAGE FRAMING AND SMOKING	30
MESSAGE FRAMING AND DEATH ANXIETY.....	30
INDEPENDENT AND DEPENDENT VARIABLES	32
<i>EXPERIMENT 1</i>	34
METHOD	34
Participants	34
Apparatus.....	34
Theoretical Replication Assessment	35
Assessment Of Death Anxiety	36
Design.....	37
Procedure.....	38
Data Analysis.....	39
Limitations.....	39
RESULTS	41
Demographics.....	41
Message Framing.....	43
Chi-square Test.....	44
Death Anxiety.....	46
DISCUSSION	48
<i>EXPERIMENT 2</i>	50
METHOD	50
Participants	50
Apparatus.....	50
Theoretical Replication Assessment	50
Assessment Of Death Anxiety	51
Design.....	51
Procedure.....	52
Data Analysis.....	53
Limitations.....	54
RESULTS	55

Demographics.....	55
Message Framing.....	57
Chi-square Test.....	58
Death Anxiety.....	61
Analysis Of Variance.....	62
DISCUSSION	65
<i>EXPERIMENT 3</i>	67
METHOD	67
Participants	67
Apparatus.....	67
Theoretical Replication Assessment	67
Assessment Of Death Anxiety	68
Design.....	69
Procedure.....	69
Data Analysis.....	70
Limitations.....	70
RESULTS	72
Demographics.....	72
Message Framing.....	75
Chi-square Test.....	76
Death Anxiety.....	77
Analysis Of Variance.....	80
DISCUSSION	81
<i>GENERAL DISCUSSION</i>	84
IMPLICATIONS FOR ANTI-SMOKING HEALTH PROMOTIONS	89
<i>REFERENCES</i>	93
<i>APPENDICES</i>	101
APPENDIX A.....	102
An example of negatively framed anit-smoking health promotions	102
APPENDIX B.....	105
Examples of the experiment research questionnaires.....	105

List of Tables

<u>Table 1.</u> <i>Age characteristics of Experiment 1 participants</i>	<i>41</i>
<u>Table 2.</u> <i>Experiment 1 Faculty of study demographics.....</i>	<i>42</i>
<u>Table 3.</u> <i>Smoking Status characteristics of Experiment 1 participants</i>	<i>43</i>
<u>Table 4.</u> <i>Age characteristics of Experiment 2 participants.</i>	<i>55</i>
<u>Table 5.</u> <i>Experiment 2 Faculty of study demographics.....</i>	<i>56</i>
<u>Table 6.</u> <i>Smoking Status characteristics of Experiment 2 participants.</i>	<i>57</i>
<u>Table 7.</u> <i>Age characteristics of Experiment 3 participants.</i>	<i>72</i>
<u>Table 8.</u> <i>Experiment 3 Faculty of study demographics.....</i>	<i>73</i>
<u>Table 9.</u> <i>Smoking Status characteristics of Experiment 3 participants.</i>	<i>74</i>
<u>Table 10.</u> <i>Frequency of Frame by Preference choice.....</i>	<i>76</i>
<u>Table 11.</u> <i>Mean DAS scores as a function of Frame, Preference and Smoking Status for female participants.....</i>	<i>80</i>

List of Figures

<u>Figure 1.</u> <i>Hypothetical subjective value function as described by Tversky and Kahneman (1981).</i>	22
<u>Figure 2.</u> <i>The theoretical framework between frame, preference, and smoking behaviour, when death anxiety scores are used as an indicator construct, showing the basic problems to be explored by this thesis</i>	31
<u>Figure 3.</u> <i>A 2 X 2 contingency classification of framing by participant's responses to the preference choice task.</i>	37
<u>Figure 4.</u> <i>Breakdown relationship between the questionnaire frame and observational variable used to discriminate the sample into four independent populations.</i>	44
<u>Figure 5.</u> <i>SPSS chart of DAS mean scores by participants' Faculty of study.</i>	45
<u>Figure 6.</u> <i>SPSS chart of DAS mean scores by participants' Sex.</i>	46
<u>Figure 7.</u> <i>SPSS chart of DAS mean scores by participants' Age.</i>	47
<u>Figure 8.</u> <i>A 2 X 2 X 2 contingency classification of participants' DAS cell means with Frame and Preference combined by Smoking Status.</i>	52
<u>Figure 9.</u> <i>Breakdown relationship between the questionnaire frame, Preference and Smoking Status used to discriminate the sample into eight independent populations for Experiment 2.</i>	58
<u>Figure 10.</u> <i>Experiment 2 SPSS chart of DAS mean scores by participants' Faculty of study.</i>	59
<u>Figure 11.</u> <i>Experiment 2 SPSS chart of DAS mean scores by participants' Sex.</i>	60
<u>Figure 12.</u> <i>Experiment 2 SPSS chart of DAS mean scores by participants' Age.</i>	60

<u>Figure 13.</u> <i>Frame X Preference X Smoking Status using mean DAS scores for smokers, former smokers and non-smokers.</i>	63
<u>Figure 14.</u> <i>Experiment 3 breakdown relationship between the questionnaire Frame, Preference and Smoking Status used to discriminate the sample into eight independent populations.</i>	74
<u>Figure 15.</u> <i>Experiment 3 SPSS chart of DAScale mean scores by participants' Faculty of study.</i>	75
<u>Figure 16.</u> <i>Experiment 3 SPSS chart of DAS mean scores by participants' Sex.</i>	76
<u>Figure 17.</u> <i>Experiment 3 SPSS chart of DAS mean scores by participants' Age.</i>	77
<u>Figure 18.</u> <i>Experiment 3 Frame X Preference X Smoking Status using mean DAS scores for smokers, former smokers and non-smokers.</i>	79
<u>Figure 19.</u> <i>An example of negatively framed health promotions – SMOKING KILLS</i>	102
<u>Figure 20.</u> <i>An example of negatively framed health promotions – SMOKING WHEN PREGNANT HARMS YOUR BABY</i>	103
<u>Figure 21.</u> <i>An example of negatively framed health promotions – SMOKING IS ADDICTIVE</i>	104
<u>Figure 22.</u> <i>Instructions used for Experiment 1</i>	105
<u>Figure 23.</u> <i>Three demographic and two lifestyle questions used for Experiment 1, Experiment 2, and Experiment 3</i>	106
<u>Figure 24.</u> <i>Positive smoking vignette and decision frames used for Experiment 1.</i>	107
<u>Figure 25.</u> <i>Negative smoking vignette and decision frames used for Experiment 1</i>	107
<u>Figure 26.</u> <i>The Templer (1970) Death Anxiety Scale used for Experiment 1, Experiment 2, and Experiment 3</i>	108
<u>Figure 27.</u> <i>Cover page as used for Experiment 2 and Experiment 3.</i>	109

Figure 28. *Positive decision frames and smoking vignette used for the Experiment 3.110*

Figure 29. *Negative decision frames and smoking vignette used for the Experiment 3.110*

Smoking: An Exploration of Message Framing and Death Anxiety

Introduction

Tobacco smoking has been linked to the prevalence of smoking related disease in Australia and is a major cause of preventable death. Each year in Australia, 20,000 people die prematurely from smoking related illness and disease. Over 1400 deaths are estimated to be caused by tobacco smoking each year in Western Australia. Morbidity trends show that thousands of people with smoking related diseases are admitted to hospitals each year. Lung cancers, respiratory and cardiovascular diseases are the leading cause of disability associated with tobacco smoking (Waddell & Lee, 1991).

Tobacco smoking is important as a health promotion issue because it is a modifiable lifestyle factor. Health promotion and education initiatives have been utilised over the last two decades in Australia to reduce the prevalence of smoking to approximately 30 percent for men and 27 percent for women. Australia's health goals and targets are to reduce tobacco smoking prevalence in the population to 22 percent by the year 2000 (Nutbeam, Wise, Bauman, Harris & Leeder, 1993).

Background To The Study

To exemplify the role of health promotion, in January, 1995, the Federal Department of Human Services and Health and the Health Department of Western Australia (HDWA) jointly launched the National Tobacco Health and Information Campaign (NTHIC) to inform the Australian public about the consequences of smoking. This campaign set out to utilise health promotion principles to persuade people not to take up tobacco smoking and those people who are smokers to stop smoking.

The NTHIC was supported by the Health Warnings Campaign (HWC) whereby it was made compulsory for 25 percent of the front of cigarette packets to display a government health warning worded in all capital lettering and stating the outcomes of smoking (e.g., smoking kills). Thirty three percent of the back of the cigarette packets are similarly earmarked and reinforces the frontal message with the risk or probable consequences of smoking. For example, smoking kills, smoking causes more illness and early death than any other drug...smoking causes more than four times the number of deaths caused by car accidents (Reynolds, 1995). Further, as part of this campaign, the whole of one side of cigarette packets were required to carry a label identifying the contents and ill-health effects from the smoke of each cigarette (Lawrence, 1994).

The NTHIC strategy also used a series of bus billboard advertisements worded in terms of 'smoking kills' (i.e., certain death) and '3 of every 4 smokers will die of smoking' (i.e., risks of death). In conjunction with the bus billboard anti-smoking health promotions a series of advertisements in magazines targeting women were marketed utilising the same, sure-thing and risk-seeking themes. Appendices A, B and C show examples of three of these HWC magazine advertisements.

What is observable is that these campaigns are designed to capitalise on the reader's averse reactions brought about by the thanatologic nature of the material shown. Put simply, the advertisements are framed negatively and explicitly feature the ill effects of smoking (e.g., experiences of morbidity or suffering mortality). At the time of collecting data for this thesis, no anti-tobacco advertisements in Western Australia were framed in terms of the benefits of not smoking.

The question remains as to whether such negative campaigns are effective given the sheer direness of the message, as well as what method can be used in the evaluation of same. To quantify or qualify the absence, presence or optimal level of efficiency and effectiveness vis-a-vis campaigns, health promotion practice emphasises the important role given to the growing body of formative evaluations. The National Health and Medical Research Council (NHMRC) has adopted a definition of formative evaluation from the US National Academy of Sciences. Formative evaluation is,

carried out prior or in connection with the different components of a program in order to formulate and improve the program during its course. It is concerned with pre-testing of materials, piloting strategies, target group classification, and other evidence with respect to potential effectiveness before initiation, continuation or wider development (NHMRC, 1995, p.186).

Under the umbrella of formative health promotion evaluation this study researched and investigated the following foci:

Can the use of positive and negative smoking related message arrangements influence participants' choice between a sure-thing or risk-seeking choice, and does the decision frame choice equation function as a mediator of self rated death anxiety?

This thesis will focus on the above mentioned NTHIC strategies which can be theoretically conceptualised and discussed vis-a-vis Prospect Theory (Tversky & Kahneman, 1979). A good deal of research has examined Prospect Theory, particularly the influence of message framing on decision making behaviour. In much of this research, evidence consistently supports the assumption that if faced

with a problem choice between a sure-thing or a risk-seeking option, referred to as decision frames worded in terms of lives saved versus lives lost (i.e., positive versus negative frames respectively). Then people should encode the relevant information in terms of possible gains and potential losses and produce inconsistent preferences between frames. It has been demonstrated that there is a preference reversal phenomenon when utility decisions are applied to messages framed in terms of survival versus mortality (Tversky, Slovic and Kahneman, 1990). Prospect Theory and its concepts are discussed in more detail in the literature review section.

The topics tested in this thesis are, firstly, to replicate the findings of Tversky & Kahneman (1981) for a message worded in relation to the issue of smoking. Underlying this topic is the assumption that for a positive frame (i.e., lives saved) the majority of people will prefer the sure-thing outcome, whereas, for the negative frame (i.e., lives lost) the majority of people will prefer the risk-seeking outcome. The second topic was to investigate death anxiety as a factor in participants' preferred choice between sure-thing and risk-seeking decision frame outcomes. Underlying this topic is the postulation by Tversky and Kahneman (1981) that self control (i.e., the fear appeal or anxiety experienced) may be an influential factor in peoples' preferred choice between a sure-thing and risk-seeking outcome for positive versus negative frames. The final topic explores the differences of preferred choice between a sure-thing and risk-seeking outcome for positive versus negative frames by smokers and non-smokers, using death anxiety as an index measure. Underlying this topic is the documented comparisons between positive and negative communications contrasted with low and high fear arousal and associated anxiety as reviewed by McGuire (1985).

Framing is defined as "affecting judgements by the way in which relevant information is presented" (Baron & Byrne, 1994, p.578). Reber (1985) adds that the term "frame" can loosely define any social situation "that will affect and control the ways in which people involve themselves with and experience that situation" (p. 286). A decision frame is defined as a "decision maker's conception of the acts, outcomes, and contingencies associated with a particular choice" (Tversky & Kahneman, 1981, p. 453). Tversky and Kahneman's study demonstrated a "systematic reversal of preference by variations in the framing of acts, contingencies, or outcomes" (p. 453). When the information of equal utility is presented in either a positive frame or a negative frame, participants in the positive framing treatment tended to choose the sure-thing option over the risk-seeking option, that is, participants were classified as risk-averse. Conversely, participants in the negative treatment tended to choose the risk-seeking option over the sure-thing option. Participants in this condition were classified as risk-taking.

Tversky and Kahneman (1981) hypothesised that this "reversal of preference" effect may have been due to a particular temporal perspective metaphor, a simplified evaluation to reduce cognitive strain, or self-control (e.g., the attenuation of one's emotional response to an outcome). These explanations as provided by the researchers are further elaborated upon within the literature review section of this thesis. Given that the context of anti-smoking health promotions are characterised predominantly by the theme of death, it is hypothesised that the choice between a sure-thing and risk-seeking option, as presented in a positively or negatively framed context, will mediate or influence death anxiety.

A discussion of health promotion as a process for embracing positive health is beyond the scope of this thesis. However, this research thesis will give the health promotor some insight into positive versus negative message frames.

Significance of the Research

With the adoption of the Tobacco Control Act 1990, and the establishment of the Western Australian Health Promotion Foundation, increasing attention has been given to the importance of ventures that actively discourage cigarette smoking, promote good health and illness prevention. These ventures, which are recognised as offering exceptional health promotion opportunities, include health, research, sport, arts, and racing agencies that were formerly sponsored by tobacco companies.

Moreover, ventures active in the promotion of health have been more pervasive since the Healthway Sponsorship and Scholarship Schemes than at any previous point in time (Holman, Donovan & Corti, 1994). Such anti-smoking ventures contribute directly to the wellbeing of individual health, and indirectly to the State's economic health.

The justification for this thesis is primarily established by epidemiological evidence showing that cigarette smoking is a major cause of cancer, in particular lung cancers, in Australia (Australian Bureau of Statistics, 1994). Saving lives is the primary health promotion goal for this research thesis. A secondary and by no means less important motivation, particularly with anti-smoking information campaigns, is the long term prospects for an improvement in the health and quality of life of Australian society. The Ottawa Charter recommends healthy public policy to make a healthy choice the likely choice. To achieve this action, various social engineering and communication measures such as legislation, economic restraints and changes to

the physical environment are currently utilised by anti-smoking health promoters in Western Australia.

Rationale of the Research

As previously stated, one of the health promotion interventions to reduce the prevalence of smoking in Western Australia has been the NTHIC. These smoking related health promotions have focused on informing the Australian public, principally smokers, of the negative effects of smoking, and, to a lesser and perhaps rare extent, the positive outcomes of not smoking. More recently, anti-smoking health promotions have emphasised the negative aspects of being a smoker. By way of an example, a full page young women's magazine advertisement as shown in Appendices A, B, and C, featured mandatory health warnings similar to those placed on tobacco packets which state, for example, "SMOKING KILLS". This advertisement then states;

If you smoke, you're around three times more likely to die between the ages of 35 and 44. You're about 10 times more likely to die of lung cancer. And about 5 times more likely to die of emphysema or chronic bronchitis. Around half of all regular smokers will be killed by their habit (see Appendix A).

Swanson (1990) states that the most successful and effective anti-smoking health promotions in Western Australia portray negatively framed messages indicative of the dire, life-threatening consequences of smoking. The research implications for thanatologic health promotions are twofold. Firstly, the above stated arrangement of information parallels Prospect Theory (Kahneman & Tversky, 1979; Kahneman & Tversky, 1984; Tversky & Kahneman, 1981) and therefore this theory may prove useful as a research tool. Secondly, research indicates that young women

have responded negatively to health marketing scare tactics which have illustrated the negative consequences of smoking (Booth, 1990). Smokers, have been portrayed as having lower self-esteem, the subject of ridicule, ascribed a graceless glamourless underdog status and portrayed as having higher, and so less control over, anxiety (Chapman, 1988). Negatively framed promotions used to frighten smokers to conform can create an internal state of tension (e.g., fear or anxiety). According to Stuteville (1970) "fear appeals may persuade only the weakly addicted or the nonuser" (p.44). Smokers reduce their anxiety by diffusing the fear. Stuteville goes on to state that negatively framed anti-smoking promotions may be ineffective, and might lead to an increase in smoking behaviour.

An understanding of anti-smoking health promotion message framing choices by health professionals and health consumers alike, and the dynamic arousal of fear and death anxiety associated with making these choices, are areas that need to be pursued more deeply by campaign co-ordinators. Therefore, this research thesis was undertaken to benefit primarily health promotion professionals with their choice of anti-smoking health promotion campaigns and the content of their campaign messages. The implications of the contextual factors utilised are important for health promotion planners and health policy makers when considering not only short-term outcome evaluation criteria, but in a related manner, when considering the long-term divergent outcomes. This will help campaign co-ordinators, and their sponsors, when evaluating the effectiveness of their health promotions by ensuring that evaluation of both the short-term and long-term change measures of campaign content and its effects are known. This research thesis attempts to clarify the central notion of health promotion, that is empowerment, and the control health promotion communications

and advertising campaigns have over our capacity to make responsible decisions for a healthy lifestyle.

Terms of the Research

This health promotion research study examines and explores participants' mean death anxiety scores as a function of positive and negative worded decision frames for the issue of smoking. The central proposition is that ventures engaging in anti-smoking health promotion activities can at least bear in mind and at most extrapolate the results to complement their existing project strategies and communications. Thereby providing health promoters with a greater understanding of the adversarial nature and subjective representations, expressed as gains or losses evaluated relative to a neutral reference point, of public anti-smoking information and education campaigns.

Research Objectives. Three objectives were generated.

1. To apply Tversky and Kahneman's (1981) experiment to the issue of the smoking behaviour.
2. To explore the influence of framing and decision frame choice as mediating factors for death anxiety.
3. To examine differences between positive and negative decision frames by smokers and non-smokers using death anxiety as an index measure.

Research Questions. In light of the preceding objectives, three research questions were selected to explore the interplay between message decision frame, choice of option (e.g., sure-thing versus risk-seeking), smoking behaviour, and death anxiety.

1. Is there a preference reversal present for a positive versus a negative frame when the framing vignette context is for the issue of smoking?
2. Does the positive decision frame versus negative decision frame preference reversal effect mediate death anxiety?
3. Is there a difference between smokers' and non-smokers' mean death anxiety scores for the positive decision frames versus the negative decision frames?

Research Hypotheses. This research seeks to acquire knowledge, and an understanding of decision making between sure-thing and risk-seeking options for positively and negatively framed health promotion communications, and explores death anxiety as a possible mediator of choice behavior. The hypotheses explored are illustrated, along with known relationships between the independent and dependent variables, by Figure 2 in the Theoretical Framework section of this thesis. Three research hypotheses were posed. All three hypotheses are framed from the position of the alternative hypothesis (Shavelson, 1981).

1. When exposed to positive versus negative decision frames, there will be a significant difference (i.e., reversal of preference) between choosing either a sure-thing or risk-seeking option.
2. When exposed to positive versus negative decision frames, there will be a significant difference (i.e., reversal of high versus low mean scores) on the death anxiety index measure between participants who choose either a sure-thing or risk-seeking option.
3. When exposed to positive versus negative decision frames, there will be a significant difference on the mean death anxiety index measure for participants'

smoking status by participants' choice between a positive or negative, sure-thing or risk-seeking decision frame.

Operational Definitions

Death Anxiety. Also called thanatophobia, an internalised fear of death and anxiety over dying of either the self or another person. Some people fear death and experience death anxiety because they worry about what will happen and where they will go after dying.

Decision Frame. A decision maker's mental conception of a positive versus negative framed message offering a sure-thing (i.e., risk-averse) and risk-seeking (i.e., risk-taking) choice of acts, outcomes or contingencies.

Negative Frame. Relates to decision frames worded in terms of lives lost.

Positive Frame. Relates to decision frames worded in terms of lives saved.

Risk-seeking. A statement which offers the probability of an outcome (e.g., 3 out of 4 smokers will die of lung cancer).

Sure-thing. A statement which offers a certain outcome (e.g., 300 smokers will die of lung cancer).

Summary

In an Australian context, anti-smoking health promotions featured in young women's magazines have made particular use of thanatologic or negatively framed sure-thing and risk-seeking messages to persuade people about the detrimental effects of smoking. This study utilises the assumptions of Prospect Theory (Kahneman & Tversky, 1979) to contribute to the scientific body of knowledge and to understand decision making, anti-smoking related health promotion communications and associated constructs (e.g., death anxiety). These factors arise

when health promoters and health consumers make subjective value responses to the way in which anti-smoking messages are presented.

Review Of The Literature

Introduction

The following review of the literature critically examines previous research papers and other literature relevant to this health promotion research study. Initially, an analysis is made of literature which describes and defines current health promotion research and defines health promotion. Secondly, considerable attention is given to papers which have sought to describe the independent and dependent variables (i.e., smoking, message framing and decision making, and death anxiety), of relevance to this study. These variables are examined thereby providing a context that illustrates how a health promotion research study can contribute to the existing knowledge base. Finally, an examination of methodological and theoretical frameworks with reference to the relevance of conducting this health promotion study at this point in time was conducted (Hawe, Degeling & Hall, 1990).

Australian Anti-smoking Health Promotion

Current Australian anti-smoking health promotion initiatives have not been well discussed in the literature, hence the following assumption by the author has been adopted to demonstrate that a thorough and appropriate definition of health promotion initiatives has been difficult to obtain. Health promotion initiatives,

demonstrate a complex web of government and non-government organisations, formal and informal bodies, groups, faculties, departments and individuals involved in a range of health promotion activities spanning service delivery, research, education and training, community development and program funding (NHMRC, 1995, p.166).

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Thus it is by no means a simple debate to contend that current national anti-smoking advertising campaigns are likely be represented by a single framework. Social marketing and media advocacy principles aimed to influence people's smoking behaviour and raise public awareness of the positive aspects of not smoking and the negative effects of smoking have been commonly discussed and utilised by government Health Promotion Foundations in Australia (Holman, Donovan & Corti, 1994; Swanson, 1990). These social marketing media campaigns encourage follow-on influences by those community groups that depend upon government support and sponsorship for their health promotions and thereby adopt government initiatives. Government policy decisions supporting social marketing and media advocacy anti-smoking strategies have to a large extent been developed and served within the health promotion PRECEDE/PROCEED planning framework (Green & Kreuter, 1991) and utilised extensively for the Smoking and Health Program in Western Australia (Farr & Fisher, 1990). The dual components of this framework according to Green & Kreuter, 1991, consist of a

“diagnostic...phase called PRECEDE, (*predisposing, reinforcing and enabling constructs in educational/environmental diagnosis and evaluation*) and...a developmental stage of health promotion planning that...initiates the implementation and evaluation process...called PROCEED (*policy, regulatory, and organisational constructs in educational and environmental development*) (p.1).

The PRECEDE/PROCEED framework noted above will not be elaborated upon further in this thesis as a more complex interpretation would be not be relevant to this study.

A review of existing literature based upon Western Australian government anti-smoking campaigns shows agreement and collaboration in the development of research initiatives between government and non-government agencies. The aim of this collaboration yielding desirable and recognised health outcomes (i.e., a reduction in smoking prevalence and increased awareness of both the promotor's slogan and the consequences of smoking tobacco). It is a commonplace observation that when examined in detail these outcome evaluations do not question the complexity of campaign inter-agency interactions and agendas in program development nor the complexity of individual human interaction with the campaign. Evaluations from the literature demonstrate how, but the correlation between health status and the question why is lacking from the health promotion literature.

Research on Anti-smoking Health Promotion. In order to conduct this anti-smoking health promotion research some definitions and assumptions need to be elaborated. Palmer and Short (1994) emphasise that health promotion "includes wider strategies designed to augment health status in general" (p.202). Palmer and Short go on further to define health promotion as a process which "engages individuals and groups in understanding and nurturing their own health" (p.203). The government work by NHMRC (1995) has recommended that health promotion research within Australia adopt the Ottawa Charter for Health Promotion as a guiding framework. According to this charter health promotion is,

the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realise aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective

of living. Health is a positive concept emphasising social and personal resources, as well as physical capacities. Therefore health promotion is not just the responsibility of the health sector, but goes beyond healthy life-styles to well-being (World Health Organisation [WHO], 1986).

Researchers have to date focused upon the outcomes of anti-smoking campaigns (NHMRC, 1995). In order to understand the influence of anti-smoking message framing, it is important to examine how differently framed communications differ in their affective response and processes. For example, how the organisation conducts an anti-smoking campaign, and formative research, (i.e., the testing of message concept, content and design or why the campaign works). Such research has been recommended as an area of need for the health promotions literature by the NHMRC. This research is important both for anti-smoking campaign selection by health promoters and the influence of such health promotions on the proposed primary and secondary target group(s). A common understanding of why campaigns are successful will assist health promoters to focus on their health issue without being dismissive of further questioning of the principal determinants of health status. Indeed, health care policies based on misunderstanding of the complex and comprehensive determinants of health might differ from the true health needs and health status of a target population (NHMRC, 1995).

Tobacco Smoking As A Priority Area For Health Promotion

Published data on the prevalence of smoking in Western Australia show that 31% of males and 25% of females smoke (HDWA, 1994; Somerford, Fitzgerald, Gattorna, Ridolfo, Serafino, Unwin & Thomson, 1995). This is important epidemiological evidence showing that approximately 1/3 of males and 1/4 of

females in Western Australia continue to choose to accept the health risks associated with tobacco smoking. These data also show a slight increase in the percentage of smokers since 1991. According to 1991 data, 27.6% of men and 22.3% of women were smokers (HDWA, 1991; Waddell & Lee, 1991). The Roy Morgan Research Centre (1995), show that for the month of October 1995, 67.3% of males and 69.1% of females did not smoke.

The long term health consequences of smoking are well documented by the US Department of Health and Human Services (1989) and will not be repeated here. However, Waddell and Lee (1991) state that:

In Western Australia it is estimated that 1400 deaths are caused by smoking...thousands of Western Australians are hospitalised each year as a result of disease caused by smoking...the estimated total cost...for illness and disease attributable to smoking in Western Australia was \$112 million (Waddell & Lee, 1991).

Goals and targets for Australia's health (Nutbeam, Wise, Bauman, Harris & Leeder, 1993) state that as a priority target for the year 2000 and beyond, efforts will be made to reduce smoking prevalence to 22% in both males and females aged 16 years and over. The overall goal for the year 2000 is to "eliminate substantially tobacco smoking by reducing the proportion of the population who smoke on a regular basis" (p. 123). The first health promotion method listed by Nutbeam, Wise, Bauman, Harris and Leeder to achieve this goal is the implementation of "marketing strategies" (p. 123).

Of all propositions, (e.g., the use of mass media advertising and social marketing) social marketing and media advocacy should have provision for detailed

health promotion planning that will be required to elicit the most influential communication campaigns. The choice by an individual to engage in smoking behaviour or not is far from simple. An in-depth understanding of individual choice, group clustering behaviours, and social conditioning is required to better understand smoking behaviour. An excellent example of a social marketing anti-smoking health promotion which does not utilise thanatological or negative framing themes was the Canadian *Participation* program (Goodin, 1989). The consistent theme throughout this campaign was that self-improvement constituted the key to a longer and healthier life. The use of negative framed messages has also been brought into question by the WHO with specific reference to tobacco smoking and anti-smoking health promotions (WHO, 1992).

Health Promotion Message Framing And Decision Making

Within this thesis, framing is defined as the way in which an arrangement of words are syntactically arranged to make logical reference to the physical world or world of ideas (Baron & Byrne, 1994; Hanks, 1989). For example, one can be informed that there is a fifty percent chance that smokers live a long healthy life or that fifty percent of smokers will die at an earlier age. The core utility value of the information transferred is the same. However, the first arrangement is an example of a positive frame (i.e., lives are said to be potentially saved) whereas the second arrangement exemplifies a negative frame (i.e., the prospect of lives being lost). According to the WHO (1992) the framing of anti-smoking related health promotions targeting young women should elicit a "healthy image, emphasising positive aspects...to make non-smoking look healthy" (p.80). As noted in the Introduction section of this thesis, Swanson (1990) argues or seeks to convince that a

thanatologic or negatively framed campaign is the proper way to proceed. The health promotor is therefore faced with many conflicting message frame choices when deciding how to invest their health promotion resources. The solution of which health promotion campaigns are most effective is not simple considering the logic that the same information can be represented with either a positive or negative framed communication.

Decision making research shows that when faced with the prospect of either a sure-thing or risk-seeking choice in a frame wherein lives are said to be potentially lost, the majority of participants will choose the risk-seeking option (Tversky & Kahneman, 1981). Further, there is a preference reversal phenomenon when the same framing condition is worded in terms of lives saved in response to which the majority of participants will prefer to choose the sure-thing option. Tversky & Kahneman employed the following methodology to illustrate the preference reversal

(percentages of participants who chose a particular option are given in parentheses):

Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

- If program A is adopted, 200 people will be saved. (72%)
- If program B is adopted, there is a 1/3 probability that 600 people will be saved, and a 2/3 probability that no people will be saved. (28%)

Which of the two programs do you favour?

The negative decision frame arrangement of the above choices consisted of a choice between the following two alternatives:

- If program C is adopted, 400 people will die. (22%)
- If program D is adopted, there is a 1/3 probability that nobody will die, and a 2/3 probability that 600 people will die. (78%)

Tversky and Kahneman's (1981) study used life and death to show that when information of equal utility is arranged into positive versus negative framing conditions utilising sure-thing and risk-seeking decision frame choice options a preference reversal effect was evident. The "reversal of preference" was discussed as being due to a particular temporal perspective metaphor. For example, when travelling toward two mountains of equal size set latitudinally from the north then the southern mountain appears smaller than the northern mountain (p. 457). However, when reversing this situation, that is, travelling in a northern direction toward the same two mountains the northern mountain appears to be the smaller. Secondly, the preference reversal phenomena was discussed by Tversky and Kahneman as possibly being due to a simplified evaluation to reduce cognitive strain (e.g., the use of a mental heuristic to quickly and easily arrive at a conclusion or make inferences thereby reducing cognitive effort). The use of a mental heuristic also decreases the amount of information one must deal with for a given decision problem. Finally, Tversky and Kahneman put forward a discussion that self-control (e.g., the norms, habits and personal characteristics of the decision maker or the attenuation of one's emotional response to an outcome, act, or contingency judgement) might adequately explain the preference reversal phenomenon.

Accordingly, only the final proposition was investigated in this thesis bearing in mind that it too is multi-factorial.

The key assumptions offered by Prospect Theory are, firstly, that there is an initial editing phase during which the decision maker constructs an internal mental representation of the decision problem (i.e., the acts, outcomes, and contingencies associated with the situation) called a decision frame. Secondly, Prospect Theory assumes that following the editing phase the decision maker moves to an evaluation phase during which the decision frames are evaluated. Fundamentally, the product variables (i.e., the decision frames) are evaluated in relation to both value and probability. In reference to decision frames worded in terms of lives saved or lost, the value of alternative outcomes are evaluated in terms of positive or negative deviations (i.e., gains or losses) as opposed to a final state of wealth or a numeric representation. Thus, Prospect Theory entails such constructs as utilities, values and probabilities, but not overall risk.

Tversky and Kahneman (1981) argue that, when from a neutral reference point, which was assigned a value of zero, the conceptualisation of outcomes are worded in terms of gains then the function describing a decision makers subjective value is concave if viewed on an X-axis as shown in Figure 1. Conversely, the function describing a decision makers subjective value of outcomes conceptualised as losses is convex. The consequential shape of this value function explains the apparent inconsistency in choice behaviour in so far as people tend to choose the risk-averse option in positive or possible gain situations and the risk-taking option in negative or potential loss situations.

Notice here that there is an additional representation to the decision makers preference. The claim is that for the positive or gain situation, the value assigned to the utility of the gain rises steadily and then plateaus out. In contrast, for the negative or loss situation, appraisals are more steeply valued to begin with until the loss plateaus out. Thus, as gains increase or losses accumulate to the right or left of the

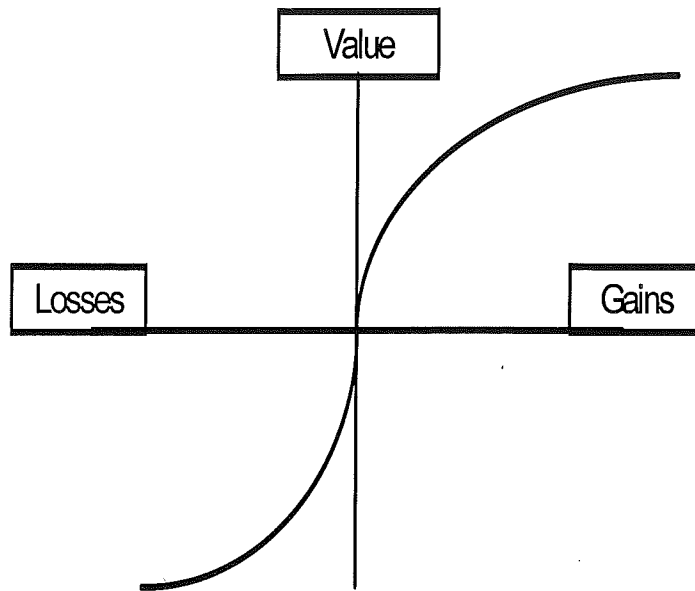


Figure 1. *Hypothetical subjective value function as described by Tversky and Kahneman (1981).*

continuum, respectively, value shifts disproportionately to a near constant rate. Equally, a gain or loss experienced by two different individuals is not a shared experience. The same event can represent a very different degree of gain or loss (Tversky, Slovic & Kahneman, 1990). Thus individual coping styles, mechanisms and strategies that mitigate responses (e.g., self-control) are hypothesised to be different among individuals.

Considering the impact of preference for a sure-thing versus risk-seeking option, both for a positive and negative frame, it might be expected that death anxiety would function in the decision frame choice when the problem information is encoded as lives saved and lives lost. Death anxiety experienced here is that anxiety brought about by the anticipation of dying from negatively framed anti-smoking advertising communications.

Death Anxiety As A Potential Factor.

Kastenbaum (1993) states that death "translates into loss or fear of loss" (p. 75) and death anxiety is the natural consequence of this loss. According to Kastenbaum, one's health status and anxiety play important roles in explaining death anxiety in adults. Nehrke, Morganti, Willrich and Hulicka (1979), for example, show a significant negative relationship between perceived health and death anxiety. It has been justifiably reasoned that the concept of death anxiety can be view as being a small component of the more elaborate concept of self-control and is broadly discussed in relation to Personal Construct Theory (Neimeyer, 1994). One wonders then, when a decision frame is worded in terms of life and death, whether death anxiety might be an emotional response that differentially functions according to the preference reversal effect.

The implicit use of negative, fear arousing messages for the issue of oral hygiene, according to research conducted by Janis and Feshbach (1953), motivates three types of effects. Firstly, the communicatee will "fail to pay attention to what is being said...to avoid thoughts which evoke incipient feelings of anxiety" (p. 78). Secondly, the arousal of anxiety will produce an aggressive reactance toward the communicator. Finally, if the emotional tension toward the message is not reduced,

the communicatee will deal with the anxiety arousing topic with defensive avoidance, thereby denying, failing to recall or losing interest in the topic. Rigby, Brown and Anagnostou (1989) examined the use of high death anxiety arousing health promotions (i.e., the Grim Reaper campaign). Findings from the Grim Reaper campaign research support Janis and Feshbach's conclusions in that the campaign outcome was "consistent with a panic-reaction that has been viewed as counter-productive" (Rigby, Brown & Anagnostou, 1989, p. 158).

The most common thanatologic related measure utilised in the empirical literature is the Templer (1970) Death Anxiety Scale (DAS). Templer's DAS, consisting of fifteen items, is regarded as a unidimensional measure of death anxiety with a high test-retest reliability (product-moment correlation, $r = .83$). The Templer DAS is supported with reported means and standard deviations from seven studies involving over 3,600 adults and adolescents for twenty three different categories of subjects (Templer & Ruff, 1971). The DAS is one of the most widely used instruments in the thanatologic literature and more is known about its properties than any other instrument. The only controversy with the Templer DAS is the fact that some studies (e.g., Warren & Chopra, 1979) have found the construct to be statistically multi-factorial. Warren and Chopra (1979) found that the data from a small sample of participants could be analysed with three sub-scales. That is, pure death anxiety, general concern, and fear of pain and operations. Warren and Chopra treat their results with caution and suggest that the "DAS is a useful index of a wider phenomenon of death concern and anxiety...for group use in the Australian context" (p.298).

Previous research findings indicate females have a higher mean DAS than males (Templer, 1970; Templer & Ruff, 1971). No significant correlation was evident for age (Templer & Ruff, 1971), however, later research does show significant effects for age thereby suggesting some inconsistent findings (Stevens, Cooper & Eugene-Thomas, 1980). Both younger and older people have shown a lower death anxiety score than middle aged persons.

Common Uses Of Prospect Theory.

A search of the research literature shows no evidence of any previous studies utilising Prospect Theory decision framing in a smoking context using death anxiety as a dependent variable.

Previous health related research that reported a preference reversal shift vis-a-vis Prospect Theory has studied the following issues. Years of life survival after opting for either cancer surgery or cancer radiotherapy treatments (McNeil, Pauker, Sox & Tversky, 1982) whereby participants choice was influenced by the survival or death rate (e.g., life expectancy) associated with the two cancer treatments. Desire for control of health care and choice of cancer treatment (Wallston, Smith, King, Smith, Rye & Burish, 1991) whereby participants were categorised into three levels of desire for control (i.e., high, medium and low) by choice of antiemetic treatment (i.e., choice and no-choice). Lives saved or lost caused by an Asian disease (Tversky & Kahneman, 1981; Kahneman & Tversky, 1984) whereby participants were categorised into two levels of frame (i.e., positive and negative) by preference (i.e., sure-thing and risk-seeking). Risk of lives saved or lost from a train/chemical accident (Fischhoff, 1983) whereby participants were categorised into two levels of frame (i.e., most-natural versus least-natural) by preference (i.e., gamble and sure-

loss). A factorial design of risky lifestyle behaviours such as drinking and driving, smoking marijuana, skipping school, having sex, taking father's car, and going to a beer party (Beyth-Marom, Austin, Fischhoff, Palmgren & Jacobs-Quadrel, 1993). In this study participants were categorised into four categories of consequences (i.e., social reactions, personal effects, effect on others and behaviour) by the participants' opinion of positive (e.g., good) and negative (e.g., bad) consequences. And lives saved and lost from an outbreak of HIV/AIDS (Levin & Chapman, 1989) whereby participants were categorised according to frame (i.e., positive and negative) by community (i.e., IV drug user and haemophiliac) by preference choice (i.e., sure-thing and risk-seeking).

Recent health promotion related studies that support Prospect Theory and the preference reversal effect include Meyerowitz and Chaiken (1987) who researched the health promotion message framing of pamphlets on breast self-examination. Participants received four levels of frame pamphlet (i.e., loss-frame, gain-frame, no-arguments and no pamphlet) by attitudes toward breast self-examination and intention to perform breast self-examination over time. Similarly, a study by Rothman, Salovey, Antone, Keough and Martin (1993) researched health promotion message framing for skin cancer. Participants were categorised into positive and negative frames by skin cancer attitude and intention to perform skin cancer prevention-related behaviours.

This research thesis differs from the aforementioned cited studies by examining message framing (i.e., positive and negative), participants' preference (i.e., sure-thing and risk-seeking), tobacco smoking behaviour (i.e., smoking and non-smoking) and the combined influence of these factors on death anxiety. By way

of experimental design, this thesis investigated death anxiety as a personality state which was hypothesised as being subject to the influence of certain factors (i.e., independent variables). In this sense, the state is “a complex reaction or response, or transitory state or condition that the organism varies in intensity and fluctuates over time” (Spielberger, 1966, p. 12). It is not a function of this thesis to enter into a long standing academic debate as to whether death anxiety or general anxiety is a personality trait or a state as discussed in Spielberger (1966). Rather, it is the sequence of the experiment, notably the presentation of a framing condition prior to the measurement of death anxiety, which dictates the logical and appropriate use of the DAS as a theoretically “state” and experimentally “dependent” variable.

Theoretical Framework

The purpose of the prior examination of empirical papers was to present theoretical justification for the experimental design. In addition to this, the literature review examined the variables used and helped to define the thesis scope and research focus. The health promotion framework within the theoretical framework utilised for this thesis is based on the PRECEDE-PROCEED model of health promotion planning and evaluation (Green & Kreuter, 1991) as has been adopted by HDWA anti-smoking campaigns (Farr & Fisher, 1991).

The idea for this research thesis was generated after observing an anti-smoking bus billboard health promotion which contained the risk-seeking copy “3 out of 4 smokers will die of lung cancer”. This advertising copy was followed-up with a further bus billboard whereby the copy content stated a sure-thing, that is, “Smoking kills”. Several approaches were made via telephone to the Federal Government’s Department of Human Services and Health, and the HDWA requesting background information on the copy used for this joint Federal/State Government sponsored NTHIC strategy. Information eventually received obtained little detail of the theoretical, empirical or analytical justification of the campaign rationale and therefore did not contribute to the processes involved in this thesis.

Instead this thesis has been carried out under a theoretical framework fully developed from the empirical research literature. The initial idea, health promotion message framing for the issue of smoking was drawn from bus billboards produced as part of the NTHIC. The theoretical development of a suitable methodology for categorising the research established the approach to explore whether anti-smoking health promotion communication influence or mediate death anxiety.

Message Framing and Prospect Theory

Prospect Theory (Kahneman & Tversky, 1979) has been used in this thesis to understand the effects of health promotion message framing. Within this framework prospect theory shows that positively framed messages are evaluated mainly in terms of gains (i.e., risk-averse choices), whereas negatively framed messages are largely evaluated in terms of losses (i.e., risky or risk-taking choices). Tversky and Kahneman (1981) show that preferences can be altered by the arrangement and wording of a message and associated decision frames. Tversky and Kahneman (1981) called this alteration of “decision frame” preference a “reversal of preference” effect (p.453). Tversky and Kahneman’s decision framing experiment involved participants choosing between either a certainty of saving 200 lives or a one third chance of saving 600 lives for the positive frame. The majority of participants choose the certainty of saving 200 lives. For the negative decision frames, participants were required to choose between either the certain death of 400 people or a two third chance that 600 people would die. The majority chose the two third chance that 600 will die.

In an attempt to explain the reversal of preference, and deviation from rationality, (e.g., different representations of the same decision frame problem should yield the same preference) Kahneman and Tversky (1981) theoretically suggest that gains and losses are evaluated relative to a neutral reference point. In addition, potential outcomes are expressed as gains (i.e., lives saved) or losses (i.e., lives lost) relative to this fixed, neutral reference point, which acts as an anchor (Tversky & Kahneman, 1979).

Therefore in this research thesis, if the decision frame choice problem is framed in terms of saving lives, the potential of nobody being lost becomes the zero reference point, the choices are evaluated as a gain, and risk-averse behaviour results. However, if the decision frame choice problem is framed in terms of lives lost, the position of the zero reference point is no one dies. The choices are evaluated as a loss and risk-seeking behaviour results.

Message Framing and Smoking

This thesis explores the issue of cigarette smoking using decision frames similar to that employed by Tversky and Kahneman (1981) to provide additional insight into the relationships between health promotion message framing and prospective outcomes for smoking behaviour. Surprisingly, no empirical research literature was found on the effects of message framing and tobacco smoking behaviour. However, the majority of anti-smoking campaigns (e.g., advertising and commercials) do contain a notable amount of overt negative content.

Message Framing and Death Anxiety

Tversky and Kahneman (1981) postulate that the attenuation of one's emotional response to an outcome (i.e., self-control) may be one explanation for the reversal of preference effect. The causes of framing effect preference-reversal have not been established (Tversky, Slovic & Kahneman, 1990). This thesis explores death anxiety using the fifteen items from Templer's (1970) self-report DAS as a measure of emotional response to test the hypothesis that health promotion message framing for the issue of tobacco smoking may effect the message recipient's level of death anxiety.

This thesis is the first attempt to replicate the reversal of preference effect shown by Tversky and Kahneman (1981) for the issue of tobacco smoking. It is also the first attempt to explore the postulation that self-control is a function in the decision frame choice. This thesis also explores the relationships between

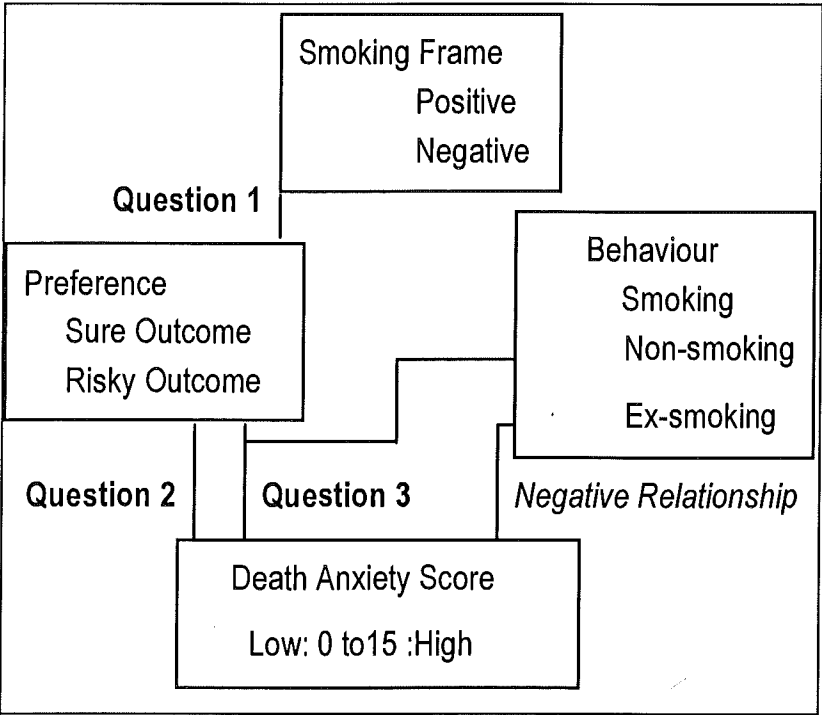


Figure 2. The theoretical framework between frame, preference, and smoking behaviour, when death anxiety scores are used as an indicator construct, showing the basic problems to be explored by this thesis.

participants' decision frame choice and tobacco smoking behaviour, using death anxiety as a dependent measure index. The relationship between message framing, preference choice, tobacco smoking and death anxiety are theoretically

conceptualised within the framework shown in Figure 2. Specific research questions are also illustrated.

In summary, the first objective of this thesis is to replicate the findings of Tversky and Kahneman (1981) in the use of decision frames for the issue of smoking. This question is of primary importance and must be replicated to satisfaction before continuing onto questions two and three. The second objective is to test death anxiety as a function in the reversal of preference effect for the decision frame choice equation. The third objective, then, is to explore differences in death anxiety of smokers versus non-smokers for the decision frames presented.

Some research indicates that there is a negative relationship between death anxiety and smoking behaviour proper, whereby the more cigarettes smoked the lower the self reported DAS score (Templer, 1972).

Independent And Dependent Variables

The independent variable (i.e., frame) constituted two randomly assigned treatments (i.e., positive, negative). Preference choice (i.e., risk-averse, risk-seeking) and tobacco smoking status (i.e., smoker, non-smoker) constituted the other two independent variables. The combined treatment and observable independent variables divide the sample into eight categories based on a quasi-randomised questionnaire for frame, participant response to the decision frame, and self-reported smoking status (see Figure 2). Ex-smokers have been explored and reported independently to observe any different relationship for this category. Ex-smokers do not form a major independent variable in this thesis but have been included only to explore diversity of the smoking variable. Therefore, the independent variables

operating in this research are the result of the experiment treatment and one's behavioural characteristics. The independent variables are as follows,

- FRAME
- PREFERENCE
- SMOKING STATUS

The dependent variable, operational in this research thesis, is represented by one's score on the Templer (1970) Death Anxiety Scale. This factor is hypothesised to function in the decision frame choice, and further, is hypothesised to be influenced by one's smoking status. The dependent variable is as follows,

- DEATH ANXIETY

Experiment 1

Method

In exploring the decision frame preference, tobacco smoking status and death anxiety issues, an initial experiment was undertaken involving 75 students from the Curtin University of Technology and University of Western Australia libraries. This provided an opportunity to explore planning layout, development and other pre-testing issues related to questionnaire completion time, questionnaire appropriateness, and administration (de Vaus, 1991, pp. 99-105). After careful evaluation and redrafting of the questionnaire as a whole, Experiment 1 was administered to a non-random sample of the target population (i.e., Edith Cowan University students).

Participants

Data were collected from 350 students attending the Churchlands, Mount Lawley and Joondalup campuses of Edith Cowan University during the month of August, 1995. Of the participants, 50.6% ($n = 177$) were female and 49.4% ($n = 173$) were male. The mean age for females was 23 years with a range from 18 years to 62 years while the mean age of the males was 23 years, with a range from 18 years to 47 years. Students who had already completed the questionnaire were requested not to participate a second time thus all observation were independent.

Apparatus

Experiment 1 was conducted to develop the research questionnaire to a stage such that the research questions and research hypotheses were adequately addressed. Experiment 1 questionnaire consisted of a single double sided page with the following on the front page:

- instructions as shown in Figure 22 (see Appendix B).
- the modified replication of Tversky and Kahneman's (1981) Asian disease decision framing experiment. Figure 24 (Appendix B) shows the positive treatment frame while the negative treatment frame is shown in Figure 25 (Appendix B).
- the Templer (1970) Death Anxiety Scale as shown in Figure 26 (Appendix B).

The reverse of the page displayed three demographic questions (i.e., participant's biological sex, year of birth and major program of study) and two lifestyle questions (i.e., smoking status and number of cigarettes smoked) as shown in Figure 23 (Appendix B).

Theoretical replication assessment. The Tversky and Kahneman (1981) Asian disease experiment is a decision framing instrument consisting of a vignette and decision choice worded so as to achieve either a sure-thing or a risk-seeking outcome for either a positive or a negative frame. Close analysis of the four decision frames show that for each frame the outcome of the two choices is of "equal expected value" (Tversky & Kahneman, 1981, p. 453). The wording creates the illusion of differing outcomes.

Decision making research shows that when faced with the prospect of either a sure-thing or risk-seeking decision frame choice for a problem wherein lives are said to be potentially lost, the majority of participants will choose a risk-seeking option (Tversky & Kahneman, 1981). There is a preference reversal when the framing condition is worded in terms of lives saved, that is, participants will overwhelmingly choose the sure-thing option. The methodology employed by Tversky and Kahneman

illustrating the preference reversal is discussed extensively in the review of the literature previously.

The vignette in Experiment 1 instrument was modified by the replacement of two vignette words and the choice probability value to reflect Western Australian environmental and interaction variables. Three vignette words were replaced. 'US' was replaced with 'Western Australia', 'Asian' was replaced with 'smoking-related', and 'people' was replaced with 'women'. The original one third probability decision frame was modified to a one quarter probability, based on current Western Australian statistics and health promotions, which emphasised that just over 400 women die each year because they smoked (Health Department of WA, 1994). Also that one in four smokers will die prematurely from smoking tobacco (Health Department of WA, 1995).

Women have been selected as the primary research target group, because anti-smoking health promotions utilised have been sourced from magazines with a largely female audience. Males represent the secondary research target group and have been included to avoid problems with questionnaire administration in a classroom setting.

Assessment of death anxiety. The Templer (1970) DAS is a fifteen item instrument which has been widely used in the research literature. The DAS items require a true or false response. Items are given a score of 1 if the answer is the same as the key (e.g., true = 1, 4, 8 - 14; false = 2, 3, 5 - 7, 15). A total score of 15 constitutes high death anxiety and a score of 0 indicates low death anxiety. The DAS was constructed as a uni-dimensional measure of death anxiety with an acceptable

internal consistency reliability, (Kuber-Richardson $\alpha = .76$), and high test re-test reliability (product-moment correlation coefficient $r = .83$).

This instrument was selected as a measure of death anxiety to examine the influence of information framing and decision frame choice problems, firstly, because of time limitations when participants complete the questionnaire (i.e., only 15 items) as shown in Figure 26 (Appendix B). This strategy was adopted so as to avoid an acquiescent response set (de Vaus, 1991). Secondly, notwithstanding the

Preferred Choice of Program			
	Sure-Thing	Risk-seeking	Totals
Smoking Frame:			
Positive	$f_{11} (f_{e11})$	$f_{12} (f_{e12})$	n_{Gain}
Negative	$f_{21} (f_{e21})$	$f_{22} (f_{e22})$	
n_{Loss}			
Totals	$n_{Sure-thing}$	$n_{Risk-seeking}$	N_{Grand}

Figure 3. A 2 X 2 contingency classification of framing by participant's responses to the preference choice task (f = frequency, f_e = frequency expected).

brevity of the Templer DAS instrument, it has been examined and validated relative to other measures of death anxiety (Lonetto & Templer, 1983; Warren & Chopra, 1979).

Design

A 2 X 2 design, as shown in Figure 3, was used to examine the relationships between the independent treatment variables (i.e., either a positive or a negative frame) and independent observational variables (i.e., either a sure-thing or risk-

seeking preference choice). According to Tversky and Kahneman (1981) sure-thing choices are associated with risk-averse decisions, and the risk-seeking choices are associated with risk-taking decisions (p.453).

Investigation of mean death anxiety scores for each cell were analysed with a Chi-square test matrix processed by SPSS for Windows (SPSS Inc., 1995).

Exploration of several models of the research design for different demographic characteristics were undertaken (e.g., sex — male, female) and lifestyle characteristics (i.e., smoking status — non-smoker, former smoker, and smoker).

Procedure

Respective lecturers and tutors were initially approached via either a flier or an e-mail notice seeking permission and cooperation to conduct the study during class contact time.

Pre-experimentally, participants were informed that information gained from the study would be used to develop better quality health promotions by examining how they deal with tobacco smoking in terms of choosing one of the two options presented. Participants were advised that their participation was entirely voluntary, was not a course requirement, and that their responses would be kept confidential according to Edith Cowan University ethical guidelines. Participants were asked to complete a paper and pencil self-report questionnaire which took between 5 to 10 minutes to complete.

Students were quasi-randomly assigned to one of the independent treatment variables, (i.e., either a positive frame featuring a health message worded in terms of lives saved, or a negative frame treatment whereby the health message was worded in terms of lives lost) according to the version of experimental booklet received. The

questionnaires were handed out, one positive then one negative and so on.

Participants were instructed to read the information from the framing vignette on page one of the questionnaire before completing the other questions.

Post-experimentally, students were debriefed as to the overall context of the experiment. Thereafter, students were courteously thanked for their time. After collection of the self-report questionnaire, participant responses were classified into one of four independent groups as illustrated in Figure 4.

Data Analysis

The chi-square test of independence between the two variables was utilised to examine the relationships between the independent variables of frame (i.e., treatment) and preference choice (i.e., observational). Data was compared to Tversky and Kahneman's (1981) results. Tests for significant associations between the demographic variables of sex, age group and faculty of study were also explored and reported. Internal consistency reliability analysis (i.e., Cronbach's Alpha) was computed for the Death Anxiety Scale.

Descriptive data for the sample was generated for comparison with data from other sources. All data were processed on IBM compatible computers with SPSS for Windows (SPSS Inc., 1993) software.

Limitations

The following limitations are inherent to Experiment 1, Experiment 2 and Experiment 3 unless stated otherwise,

1. Acknowledgement is made that the framing vignette constitutes a choice of program which may not represent a personal choice normally made by an individual. The vignette is designed to represent an imaginary situation and in no

way represents an individual choice which can be generalised to suggest that an individual may act in any particular manner or prefer a particular outcome.

2. It is acknowledged that smoking behaviour and decision making are subject to the influence of an amalgam of variables and that, along with death anxiety, individuals are potentially influenced by many other factors such as biological, psychological, cultural beliefs, economic and social situations. It is beyond this study that all such variants be identified, codified or investigated.
3. Tertiary students constituted the primary sampling frame for this study.

Generalisation of results to other populations would therefore be inappropriate.

The results for Experiment 1 show that there were difficulties with the questionnaire layout. It was observed that some participants were reading the DAS items before completing the decision frame choice. If the preference reversal effect observed (i.e., no effect for the positive frame and significant effect for the negative frame treatment) was due to the questionnaire layout then the questionnaire would need to be redesigned to abolish the apparent contamination or confounding. The questionnaire was hence modified for Experiment 2 so as to remove any potential confounder. This was achieved by placing the framing vignette on page one and the Death Anxiety Scale and demographics on page two. A cover sheet was added to the front for aesthetics and to add authenticity. Participants were instructed, both verbally and with an overhead projector slide, that they should complete the decision choice problem on page one before turning over to page two.

Results

Demographics

The demographics of Experiment 1 are reported in Table 1, Table 2 and Table 3. Demographic information on participants' sex, age, course of study, and smoking status were collected.

The mean age of the sample participants was 23 years. All participants were attending Edith Cowan University, a large multi-campus Western Australian university offering a variety of courses. Participation was entirely voluntary and anonymous. There were slightly more males than females. Participants were pseudo-randomly assigned to one of the experimental treatments and recruited from advertisements addressed to respective lecturers requesting access to classes during normal contact time.

The majority of participants reported as being enrolled in the Faculty of

Table 1

Age characteristics of Experiment 1 participants (N = 350)

Variable	<u>N</u>	%	<u>n</u>	%	<u>n</u>	%
Age	Total		Male		Female	
18 – 24	276	78.9	132	76.3	144	81.4
25 – 34	45	12.9	23	13.3	22	12.4
35 – 44	21	6.0	17	9.8	4	2.3
45 – 54	6	1.7	1	0.6	5	2.8
55 - 64	2	0.6	0	0.0	2	1.1

Table 2

Experiment 1 Faculty of study demographics (N = 350)

Variable	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Faculty	Total		Male		Female	
Science, Technology & Engineering	155	44.3	87	50.3	68	38.4
Business	104	29.7	55	31.8	49	27.7
Arts	46	13.1	22	12.7	24	13.6
Health & Human Science	39	11.1	5	2.9	34	19.3
Education	2	0.6	1	0.6	1	0.6
WA Academy of Performing Arts	2	0.6	2	1.2	0	0.0
Not Stated	2	0.6	1	0.6	1	0.6

Science, Technology and Engineering, ($\underline{n} = 155$, 44.3%), as shown in Table 2.

Twenty nine point seven percent of participants were enrolled in the Faculty of Business, 13.1% in the Faculty of Arts and 11.1% in the Faculty of Health and Human Science.

Among the female participants, 4.5% were current smokers, 11.9% were former smokers, while 83.5% reported being non-smokers. For the males, 16.3% were current smokers, 16.3% were former smokers, while 67.4% reported being non-smokers (see Table 3).

When compared to current research data the above mentioned values for smokers and non-smokers are not representative of the Western Australian general population. *Australian Readership and Product Data: January 1995 - December 1995*, for the month of October, 1995 (Roy Morgan Research Centre, 1995) show

that during the period of conducting this thesis research study 23.5% of women (i.e., females 14 years of age and over) were smokers while 69.1% of women were non-smokers. For men (i.e., males 14 years of age and over) 67.3% were non-smokers while 20.1% were current smokers.

Message Framing

Student participants were selected by non-probability sampling. Participants were quasi-randomly assigned to one of the independent treatment variables (i.e.,

Table 3

Smoking Status characteristics of Experiment 1 participants (N = 350)

Variable	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Smoking Status	Total		Male		Female	
Never Smoked	263	75.6	116	67.4	147	83.5
Former Smoker	49	14.1	28	16.3	21	11.9
Current Smoker	36	10.3	28	16.3	8	4.5

either a positive frame featuring a health message worded in terms of lives saved, or a negative frame treatment whereby the health message was worded in terms of lives lost). The positive and negative treatments were in turn divided according to the participants' preference choice between either a sure-thing or risk-seeking outcome (Tversky & Kahneman, 1981). Sample size and subsequent breakdown into independent observation groups is illustrated in Figure 4.

Simple visual inspection of Figure 4 shows that there was an inflated preference reversal effect for the negative frame treatment juxtaposed beside the

positive framing treatment. Of those participants who received the positive treatment, 85 preferred the risk-seeking option over the 87 who preferred the sure-thing option. Of participants who received the negative frame treatment, 55 chose the sure-thing whilst 111 preferred the risk-seeking option.

Chi-square Test

A two-way Chi-square analysis, applying Yate’s continuity correction for one

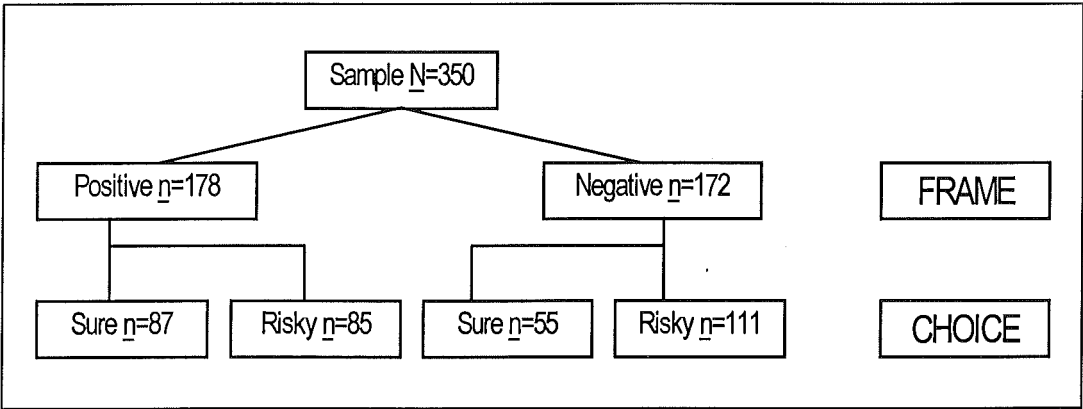


Figure 4. Breakdown relationship between the questionnaire frame and observational variable used to discriminate the sample into four independent populations.

degree of freedom (Shavelson, 1988), was performed to test the reversal of preference effect thereby adding support to prospect theory for decision frames with a smoking issue message. Assumptions of the Chi-square were met. Each observation fell in only one cell and was independent of every other observation, the observations were measured as frequencies, expected frequency for every cell was above ten and the table was corrected for continuity. Results revealed a significant change in the negative framing treatment compared to the positive treatment, χ^2 (1,

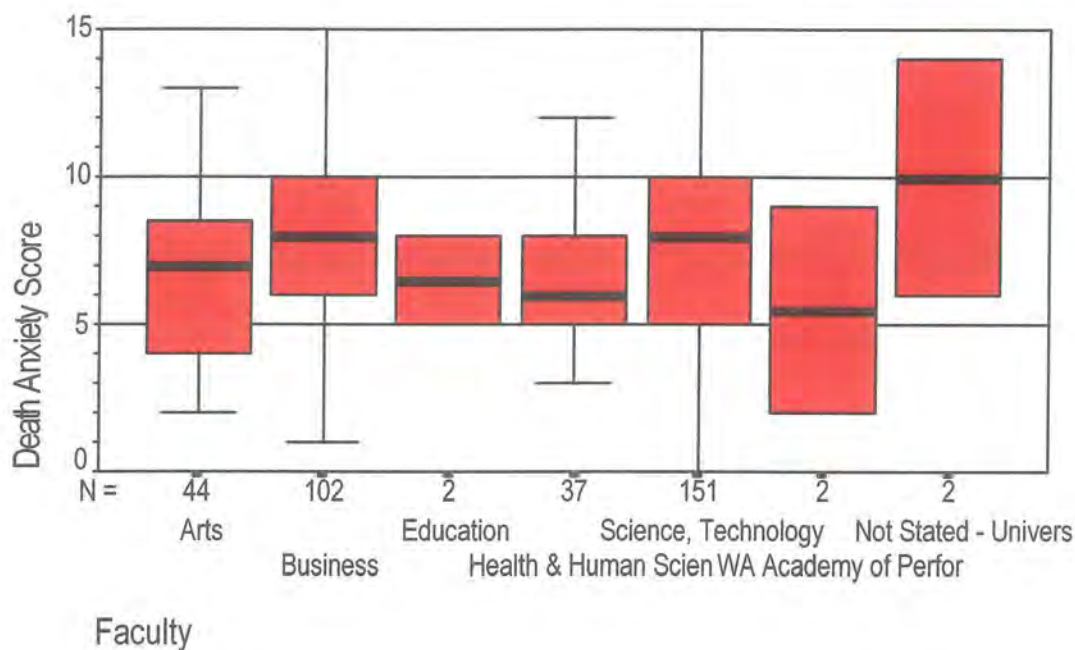


Figure 5. SPSS chart of DAS mean scores by participants' Faculty of study.

$N = 350$) = 9.85, $p < .002$. The data show strong support for prospect theory of information processing when the message was framed negatively, but the reversal of preference function did not occur when the message was positively framed. Only the negative frame was a reliable predictor. One speculation of this could be that the questionnaire design (i.e., placing of the framing vignette and DAS on the same page) was a confounder.

Of the 178 students presented with the positive framing treatment, 48.9% chose the sure-thing option, as against 47.8% who chose the risk-seeking option. Conversely, of the 172 students presented with the negative framing treatment, 32.0% chose the sure-thing option over 64.5% who preferred the risk-seeking option. Of the total number of students ($N = 350$) exposed to the framing treatments presented, 6 failed to choose either choice of the positive framing treatment and 6

failed to choose either choice from the negative framing treatment. Data from these students were therefore excluded.

Death Anxiety

The fifteen Death Anxiety Scale (Templer, 1970) items showed high internal consistency reliability (Cronbach’s Alpha, $\alpha = .72$). Warren and Chopra (1979) investigated Cronbach’s Alpha Co-efficient of internal consistency on Australian university students and obtained an Alpha of .65 , describing this observation as being “moderately internally reliable in terms of a reasonable alpha coefficient” (p. 295).

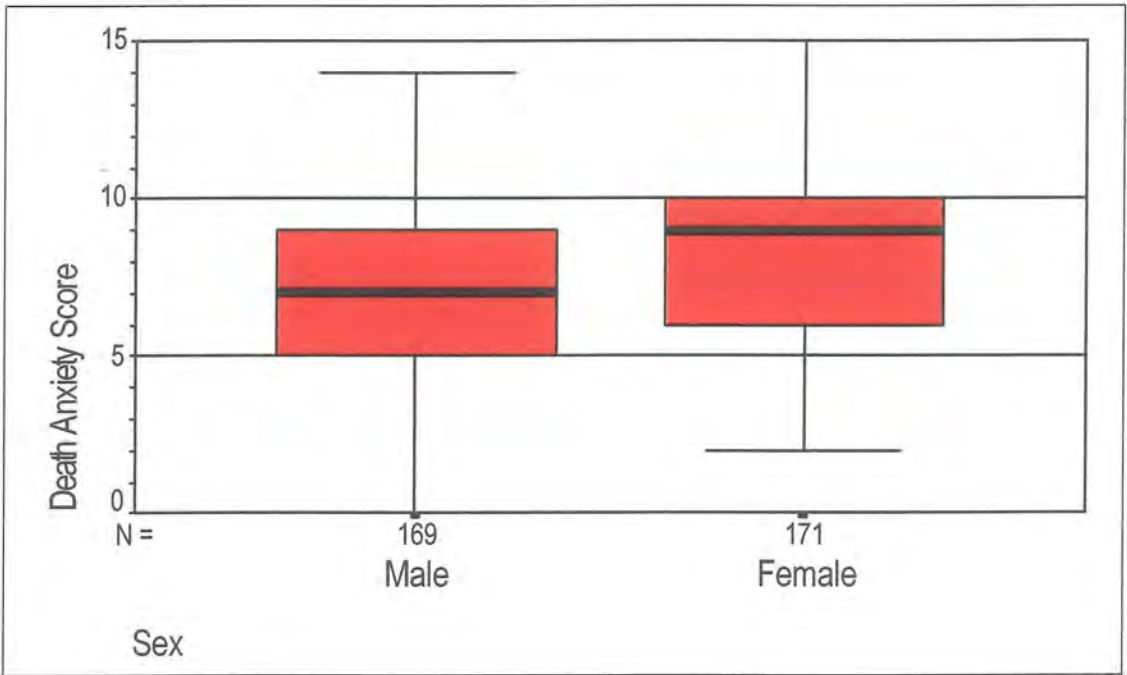


Figure 6. SPSS chart of DAS mean scores by participants’ Sex.

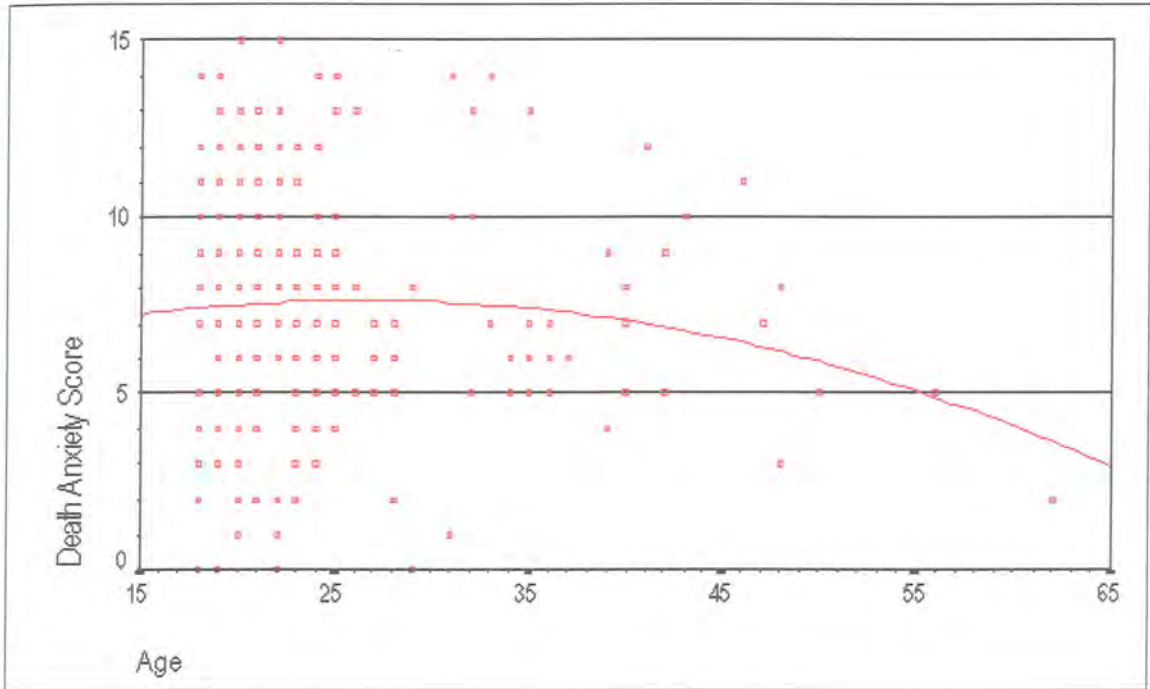


Figure 7. SPSS chart of DAS mean scores by participants' Age.

As shown in Figure 5, data support the results of previous studies (e.g., Templer & Ruff, 1971; Warren & Chopra, 1978) showing lower death anxiety scores for participants studying in the helping professions. The Faculty of Business and Faculty of Science, Engineering and Technology both show higher mean death anxiety scores ($\underline{M} = 8.11$, $\underline{SD} = 3.11$, and $\underline{M} = 7.48$, $\underline{SD} = 3.30$ respectively).

Consistent with Templer and Ruff's (1971) study, Figure 6 shows female death anxiety scores were higher ($\underline{M} = 8.27$, $\underline{SD} = 2.79$) than for male participants ($\underline{M} = 6.70$, $\underline{SD} = 3.16$). These observations are compatible with Australian data obtained by Warren and Chopra (1979) who explored the Templer DAS characteristics using students from the University of Newcastle. Warren and Chopra found that there was a "tendency for females to score higher than males" (p. 297).

There is a trend ($p = .196$), although not significant, indicative of lower death anxiety scores for older participants as illustrated in Figure 7. On the surface, this trend would appear consistent with previous research (Templer & Ruff, 1971), however, due to the low number of older participants any interpretation relative to significance is reserved.

Discussion

The purpose of this study was to initially test the first hypothesis that there would be an observable preference reversal effect for the issue of smoking. The 350 participants randomly received either a positive framed or negative framed questionnaire. The participants were classified into one of four categories according to their preference for either a certain (i.e., sure-thing) or a probable (i.e., risk-seeking) outcome.

Experiment 1 demonstrates that message framing does lead to expected choice preference but only for the negatively framed condition. This finding is unusual given the extent to which Tversky and Kahneman's (1981) work has been replicated and supported. Unfortunately, the expected result for the positive decision frames was not observed. It is thought that the layout of the questionnaire was a significant confounder and hence would need to be addressed before any future experiment was proceeded with. Henceforth, the framing choice problem and death anxiety scale would feature on separate pages.

Whilst the preference reversal phenomenon was clearly not demonstrated, Experiment 1 provided an opportunity to establish the reliability for the Templer (1970) DAS as a measure with Cronbach's index of internal consistency, $\alpha = .72$.

Several limitations are inherent in this pilot research. Displaying both the decision frame vignette and DAS on the same page produced a negative bias in the positive framing treatment and expected results were not obtained. The preference reversal phenomenon was clearly not evident, therefore the validity of the questionnaire and framing instrument was not established.

Experiment 2

MethodParticipants

Data were collected from 708 students attending the Churchlands, Mount Lawley and Joondalup campuses of Edith Cowan University during the months of August and September of 1995. Of the participants, 51.8% ($n=367$) were female and 48.2% ($n=341$) were male. The mean age for females was 23 years with a range from 18 years to 53 years. The mean age of the males was 23 years with a range from 18 years to 52 years.

Apparatus

Experiment 2 was conducted with a modified questionnaire format to avoid confounding from having both the instructions, framing vignette, and Death Anxiety Scale on the same page. Instructions were removed from the questionnaire and displayed on an overhead projector prior its administration. The questionnaire for Experiment 2 consisted of three pages as follows:

1. a cover page with one instruction as shown in Figure 27 (Appendix B).
2. the modified replication and adaptation of Tversky and Kahneman's (1981) Asian disease decision framing experiment using 1/4 probability decision frames for a population of 400 on page one.
3. the Templer (1970) Death Anxiety Scale on page two along with the three demographic questions, and two lifestyle questions as used for Experiment 1.

Theoretical replication assessment. As in Experiment 1, use was made of the Tversky and Kahneman's (1981) Asian disease experiment decision frame instrument consisting of a vignette, and decision choice, worded so as to achieve

either a sure-thing or risk-seeking outcome. A positive versus negative frame, wherein 1/4 probability outcomes were utilised.

It was anticipated that there would be a significant preference reversal effect when the framing condition was worded in terms of lives saved. That is, participants would overwhelmingly choose the sure-thing option when compared to the framing condition worded in terms of lives lost in which the majority of participants would choose the risk-seeking option.

The same vignette modifications as shown for Experiment 1 were used for Experiment 2. 'US' was replaced with 'Western Australia', 'Asian' replaced with 'smoking-related', and 'people' replaced with 'women'. The original 1/3 probability decision frames for a population of 600 was modified to 1/4 probability for a population of 400.

Assessment of death anxiety. Similar to Experiment 1, the 15 item Templer (1970) DAS instrument was used as an index measure for death anxiety.

Results from Experiment 1 supported the internal consistency reliability of this instrument which was analysed with SPSS for Windows (SPSS Inc, 1993).

Design

A two-way design, as shown in Figure 3 from Experiment 1, was used to examine the relationships between the independent treatment variables (i.e., either a positive or a negative frame) and independent observational variables (i.e., either a sure-thing or risk-seeking preference choice).

A 2 X 2 X 2 non-orthogonal factorial three-way ANOVA experimental design (Keppel, 1982), as shown in Figure 8, was used to explore the differences between cell means for the observed independent variables (i.e., decision frame

preference and smoking status). The dependent variable used was the mean cell DAS (Templer, 1970) scores.

Procedure

Respective lectures and tutors were again initially approached via either a flier or an e-mail notice seeking permission and cooperation to conduct the study during class contact time. Classes that were utilised for Experiment 1 were excluded from this study.

	Frame (factor C)			
	Positive (c1)		Negative (c2)	
	Preference Choice (factor A)		Preference Choice (factor A)	
	Sure-thing (a1)	Risk-seeking (a2)	Sure-thing (a1)	Risk-seeking (a2)
Smoking Status (factor B)				
Non-smoker (b1)	ABC_{111}	ABC_{211}	ABC_{112}	ABC_{212}
Smoker (b2)	ABC_{121}	ABC_{221}	ABC_{122}	ABC_{222}

Figure 8. A 2 X 2 X 2 contingency classification of participants' DAS cell means with Frame and Preference combined by Smoking Status.

Pre-experimentally, participants were informed that information gained from the study will be used to develop better quality health promotions by examining how they deal with smoking in terms of choosing one of the two options presented. Participants were advised that their participation was entirely voluntary, was not a course requirement, and that their responses would be kept confidential according to Edith Cowan University ethical guidelines. Participants were asked to complete a paper and pencil self-report questionnaire that took between 5 to 10 minutes of their

time. Students who had previously participated in the study in other classes were asked not to participate a second time so as to avoid a familiarity bias.

Students were quasi-randomly assigned to one of the independent treatment variables (i.e., either a positive frame featuring a health message worded in terms of lives saved, or a negative frame treatment whereby the health message was worded in terms of lives lost). The questionnaires were handed out one positive then one negative and so on. Participants were instructed, both verbally and with an overhead projector visual, to read the information from the framing vignette on page one of the questionnaire before completing the remaining questions on page two.

Post-experimentally, students were debriefed as to the overall context of the experiment. Thereafter, students were courteously thanked for their time. After collection of the self-report questionnaire, participant responses were classified into one of eight independent groups for analysis.

Data Analysis

The two-way Chi-square test of independence between two independent variables was utilised to examine the relationships between the independent variables of frame (i.e., treatment) and preference choice (i.e., observational). Data was compared to Tversky and Kahneman's (1981) results in order to ascertain whether the preference reversal effect was observable.

Tests for significant associations between the demographic variables of sex, age group and faculty of study were also explored and reported. Internal consistency reliability analysis (i.e., Cronbach's Alpha) was computed for the DAS.

A three-way non-orthogonal ANOVA was used to examine the differences between cell means for the observed independent variables (i.e., decision frame by

smoking status) with the dependent variable being mean cell DAS (Templer, 1970) scores.

Descriptive data for the sample were generated for comparison with data from other sources. All data were processed on IBM compatible computers with SPSS for Windows (SPSS Inc., 1993) software.

Limitations

The first three limitations, as imposed in Experiment 1, apply to Experiment 2.

Limitations relevant to the current experiment are twofold. Firstly, analysis of data from Experiment 2 shows a significant total reversal of preference effect. The findings obtained for the male participants were not optimal when the data were juxtaposed with the female data. This is illustrated by participants' preference choice as shown by Figure 9 within the Results section. Secondly, to maintain a more precise and carefully replicated Tversky and Kahneman (1981) Asian disease experiment, the questionnaire vignette values would need to be modified to the original 1/3 probability decision frame from a population of 600. Experiment 3 decision frame values were modified back to Tversky and Kahneman's (1981) original probability values after reading an Australian newspaper article supporting the use of 1/3 probabilities by Connolly (1992), the heading of which reads *Smokes to kill 1 in 3 - Study*.

Results

Demographics

The demographics of Experiment 2 are reported in Table 4, Table 5 and Table 6.

The mean age of the sample participants was 23 years, with a range of 18 years to 53 years. The sample data are skewed toward a younger age and therefore

Table 4

Age characteristics of Experiment 2 participants ($N = 708$)

Variable	<u>N</u>	%	<u>n</u>	%	<u>n</u>	%
Age	Total		Male		Female	
18 - 24	518	73.2	261	76.5	257	70.0
25 - 34	128	18.1	54	15.8	74	20.2
35 - 44	48	6.8	22	6.5	26	7.1
45 - 54	14	2.0	4	1.2	10	2.7

not truly representative of the general population. For the female participants, the skewness = 1.90 ($SE = .127$) and for males the data show the skewness = 1.98 ($SE = .132$). From the total sample, 73.2% fell into the 18 years to 24 years of age group, and over 90% were below the age of 35 years.

The majority of participants reported as attending the Faculty of Business ($n = 312$, 44.1%) followed by the Faculty of Science, Technology and Engineering, $n = 174$, 24.6%.

Among the female participants, 18.4% were current smokers, 18.9% were former smokers, while 62.7% reported being non-smokers. For the males, 17.6% were current smokers, 17.1% were former smokers, while 65.3% reported being non-smokers. These results show that for this sample the smoking rate was moderately lower than that for the general population as shown by the *Australian Readership and Product Data: January 1995 - December 1995* (The Roy Morgan Research Centre, 1995). These Australian data show that the prevalence of female smokers in 1995 was 23.50% while for male smokers it was 20.10%.

Table 5

Experiment 2 Faculty of study demographics ($N = 708$)

Variable	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Faculty	Total		Male		Female	
Business	312	44.1	160	46.9	152	41.4
Science, Technology & Engineering	174	24.6	117	34.3	57	15.5
Health & Human Science	78	11.0	14	4.1	64	17.4
Arts	56	7.9	20	5.9	36	9.8
Education	47	6.6	20	5.9	27	7.4
WA Academy of Performing Arts	24	3.4	2	0.6	22	6.0
Not Stated	17	2.4	8	2.3	9	2.5

Table 6

Smoking Status characteristics of Experiment 2 participants (N = 708)

Variable	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Smoking Status	Total		Male		Female	
Never Smoked	451	64.0	222	65.3	229	62.7
Former Smoker	127	18.0	58	17.1	69	18.9
Current Smoker	127	18.0	60	17.6	67	18.4

For current smokers a significant though weak negative relationship was found between Templer's (1970) DAS scores and the number of cigarettes smoked, $r = -.19$, $p = .04$. Although not one of the objectives of this thesis, this finding adds supporting evidence to the results of Templer's (1972) study which demonstrated a significant negative relationship at the .01 level between DAS scores and the number of cigarettes smoked by smokers.

Message Framing

Student participants were selected by a non-probability sampling method and randomly assigned to one of the independent treatment variables as discussed in the experiment method section. Positive and negative treatments were divided according to the participants' preference choice for either a sure-thing or risk-seeking outcome. Participants were further grouped according to responses to smoking status. Sample size and the subsequent breakdown into independent observation groups of participants for further analysis is illustrated in Figure 9.

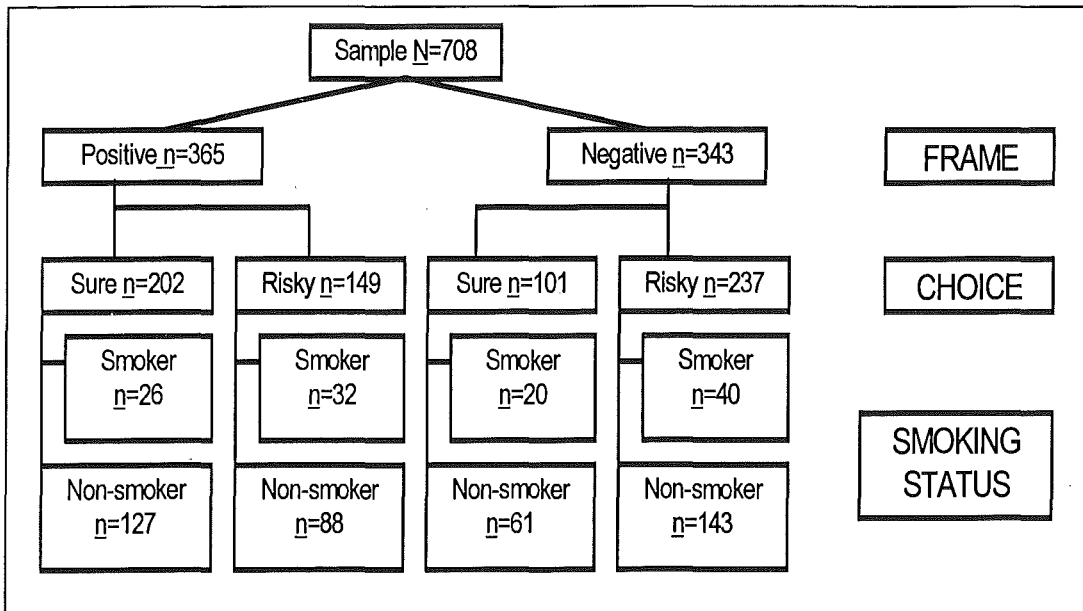


Figure 9. Breakdown relationship between the questionnaire frame, Preference and Smoking Status used to discriminate the sample into eight independent populations for Experiment 2.

As hypothesised, the female data show a significant preference reversal effect. For the female participants who received a positive framing treatment, 60.8% chose the sure-thing option whilst 39.2% chose the risk-seeking option. For the female participants who received the negatively framed treatment, 36.4% chose the sure-thing option while 63.6% chose the risk-seeking option. By comparison, of the male participants receiving the positively framed treatment, 53.9% chose a sure-thing option and 46.1% chose the risk-seeking option. Male participants who received the negatively framed treatment showed a more extreme preference for the risk-seeking option with 77.0% choosing the risk-seeking option and 23.0% choosing the sure-thing option.

Chi-square Test

A 2 X 2 chi-square test was performed to determine the significance of replication for the preference reversal effect thereby adding empirical support to prospect theory decision framing for the issue of smoking. The data show strong support for prospect theory and the axiom of preference reversal between participants preferred choice between the sure-thing and risk-taking options for the positive

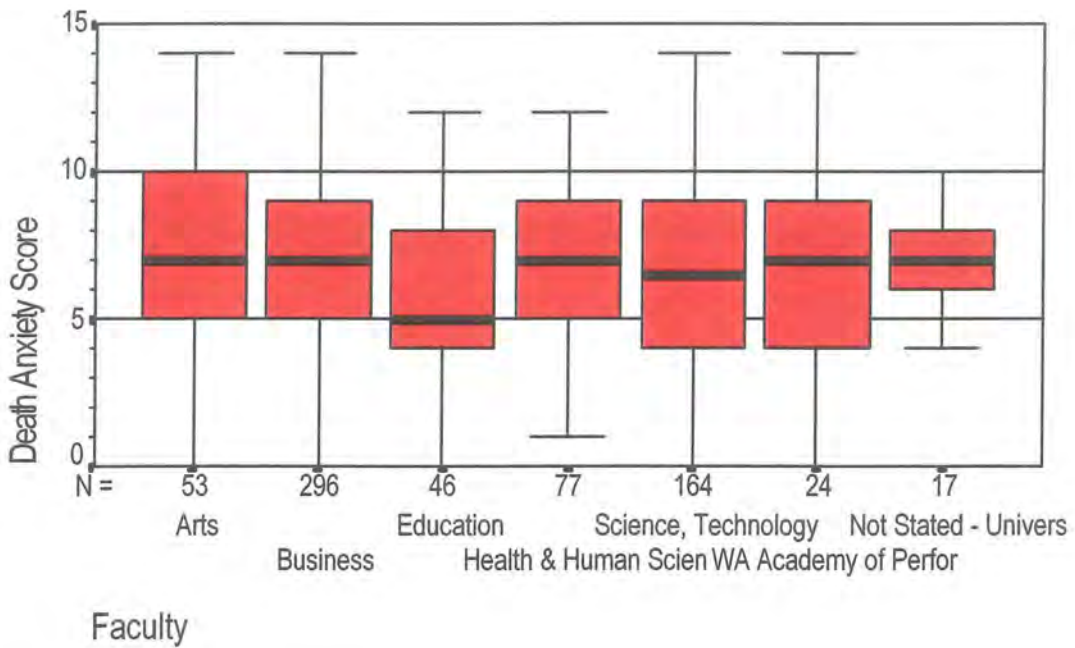


Figure 10. SPSS chart of Experiment 2 DAS mean scores by participants' Faculty of study.

framing and negative framing treatments. Both the negative and positive framing treatment groups were reliable in this regard ($\chi^2(1, N = 689) = 52.38, p < .001$), thus the null hypothesis was rejected in favour of the preference reversal axiom.

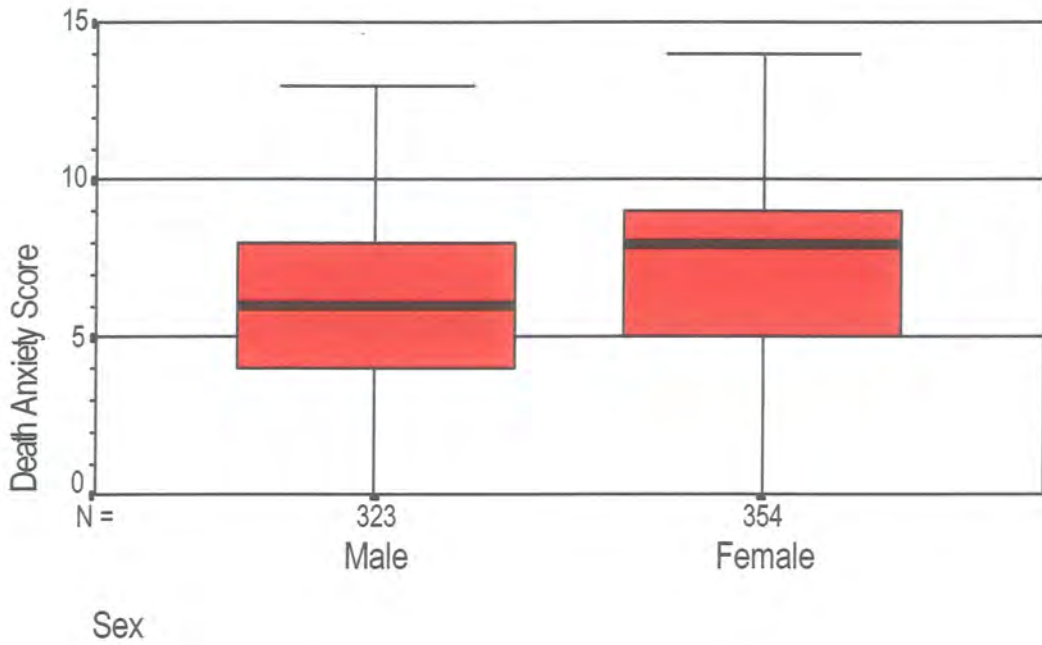


Figure 11. SPSS chart of Experiment 2 DAS mean scores by participants' Sex.

Assumptions of the Chi-square were met. Each observation fell in only one cell and was independent of every other observation, the observations were measured

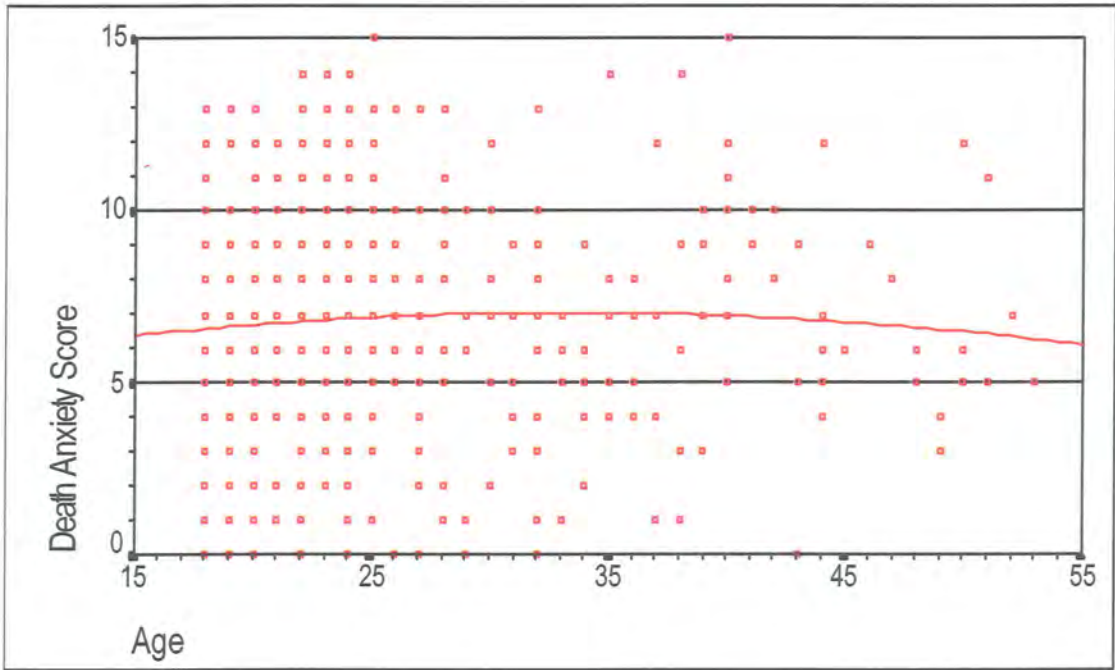


Figure 12. SPSS chart of Experiment 2 DAS mean scores by participants' Age.

as frequencies, expected frequency for every cell was above ten and the table was corrected for continuity.

Of the 365 students presented with the positive framing treatment, 55.3% chose the sure-thing option, as against 40.8% who chose the risk-seeking option. Conversely, of the 343 students presented with the negative framing treatment, 29.4% chose the sure-thing option over 69.1% who preferred the risk-taking option. Of the total number of students ($N = 708$) exposed to the framing treatments presented, 14 failed to choose either choice of the positive framing treatment and 5 failed to choose either choice from the negative framing treatment. Data from these students were therefore excluded.

Death Anxiety

The fifteen DAS (Templer, 1970) items showed high and acceptable level of internal consistency reliability (Cronbach's Alpha = $\alpha .73$). Nunnally (1967) has concluded that alpha values of .60 are acceptable for an alpha measure of internal consistency reliability. Therefore, it was justified to state that the death anxiety ratings were reliable.

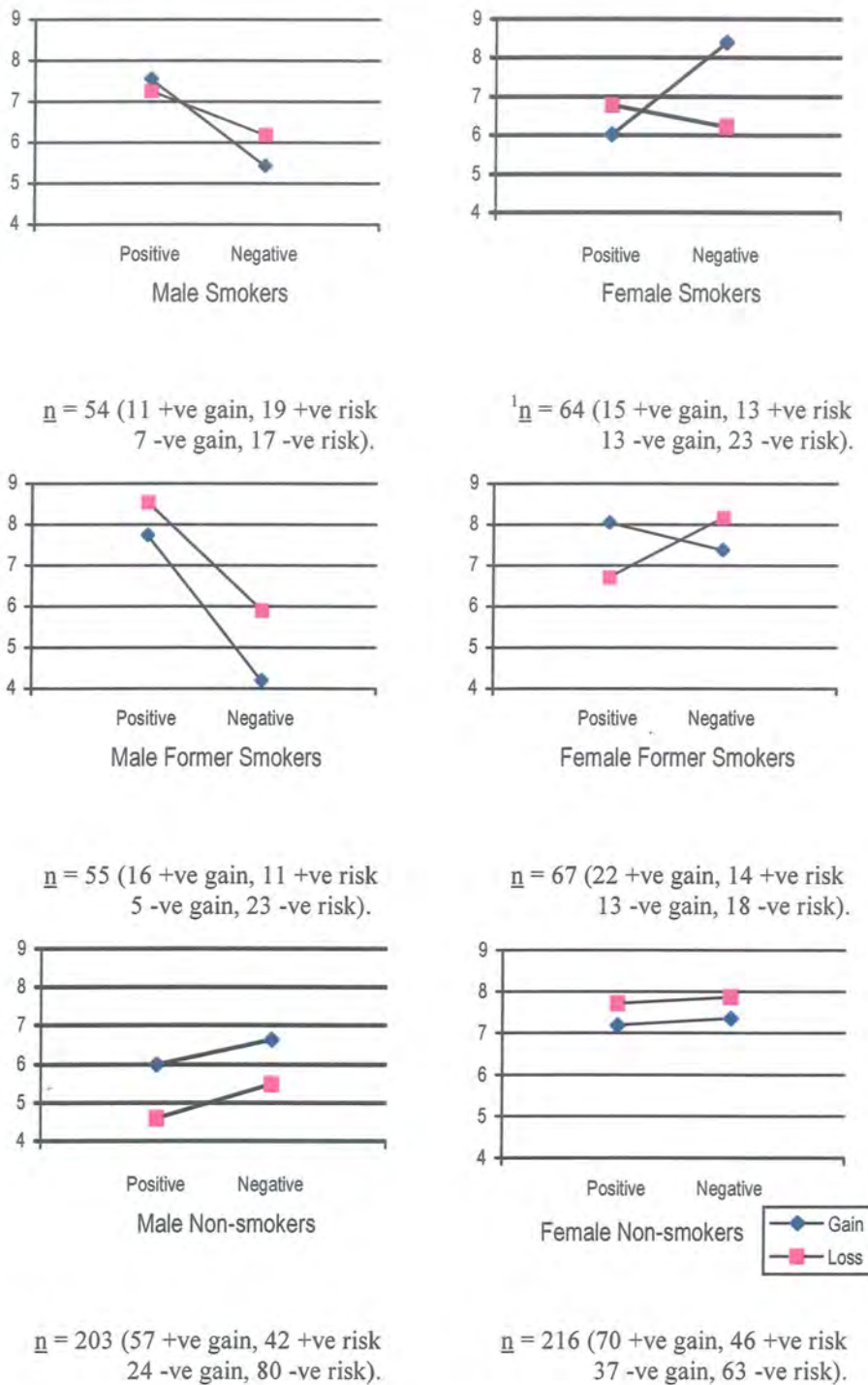
Participants attending the Faculty of Arts showed a mean death anxiety score of $\underline{M} = 6.66$ ($\underline{CI} = 5.62, 7.70$). Faculty of Business death anxiety means were $\underline{M} = 6.83$ ($\underline{CI} = 6.41, 7.25$). Faculty of Education death anxiety means were $\underline{M} = 5.46$ ($\underline{CI} = 4.41, 6.51$). Faculty of Health and Human Science $\underline{M} = 6.91$ ($\underline{CI} = 6.19, 7.65$). Faculty of Science, Engineering and Technology $\underline{M} = 6.51$ ($\underline{CI} = 5.98, 7.04$). The mean death anxiety score for the WA Academy of Performing Arts was $\underline{M} = 7.00$ ($\underline{CI} = 5.32, 8.68$).

Mean death anxiety scores for female participants was $\underline{M} = 7.36$ ($\underline{CI} = 7.01, 7.71$), while for male participants the mean death anxiety score was $\underline{M} = 5.95$ ($\underline{CI} = 5.55, 6.34$). The mean death anxiety score for female participants who were current smokers was $\underline{M} = 6.71$ ($\underline{CI} = 6.03, 7.41$), and $\underline{M} = 7.55$ ($\underline{CI} = 7.14, 7.95$) for females who were never-smokers. For male participants who reported as being current smokers the mean death anxiety score was $\underline{M} = 6.95$ ($\underline{CI} = 6.10, 7.97$), and $\underline{M} = 5.66$ ($\underline{CI} = 5.22, 6.10$) male never-smokers.

The mean death anxiety score for participants in the 18 - 25 year age group was $\underline{M} = 5.62$ ($\underline{CI} = 4.00, 7.23$). For the 35 - 34 year age group the death anxiety mean score was $\underline{M} = 6.82$ ($\underline{CI} = 6.52, 7.11$), 35 - 44 was $\underline{M} = 6.70$ ($\underline{CI} = 6.13, 7.27$), 45 - 54 was $\underline{M} = 7.19$ ($\underline{CI} = 6.19, 8.19$), 55 - 64 was $\underline{M} = 6.57$ ($\underline{CI} = 5.07, 8.07$). As is shown in Figure 12, there is not a significant trend for death anxiety to increase from younger age groups, to plateau in the 30 through to 40 year age groups and thereafter leans toward decreasing with further increases in age.

Analysis of Variance

The data were treated in three ways to permit comparison with previous investigations. Firstly, data were explored for both males and females combined, then, male and female data were explored separately. Finally, non-smokers and former smokers were combined. The data for this analysis were arranged in a 2 X 2 X 2 (frame by preference by smoking status) non-orthogonal factorial ANOVA. Assumptions of independence, normality and homogeneity of variances as applicable to ANOVA were met.



¹ $p < .05$.

Figure 13. Frame X Preference X Smoking Status using mean DAS scores for smokers, former smokers and non-smokers.

Data analysis revealed that the death anxiety index indicated a significant three-way interaction for female smokers at the .05 level, $F(1, 339) = 4.00, p < .05$. Figure 13 illustrates the nature of this interaction. The significant three-way interaction represents differences in the slopes as a function of the negative decision frames, with participants preferring the sure-thing choice (i.e., 300 women will die) showing a higher death anxiety score.

A post-hoc t-test comparison shows a significant difference between female smokers in the negative treatment frame who choose a sure-thing option and female smokers in the negative treatment frame who choose risk-seeking option, $t(23.54) = 3.17, p = .004$. Assumptions for the t-test homogeneity of variances were violated so the t test for unequal variances was computed and found to be significant. The mean DAS in the sure-thing group was 8.38 ($SD = 2.02$), compared to 6.22 in the risk-seeking group ($SD = 1.88$).

For the males, there was a significant two-way interaction of framing treatment between participants who were non-smokers and participants who smoked, $F(1, 249) = 5.11, p < .05$. The nature of this two-way interaction is shown in Figure 13, whereby smokers who received the positive frame had higher death anxiety than non-smokers who received the positive frame.

Another noteworthy feature of the data was the interrelations among the various demographic measures. For instance, smoking status was highly correlated to age, $r = .21, p < .01$. Age was also significantly correlated with the number of cigarettes smoked per day, $r = .10, p < .01$. Participants' sex was correlated significantly with DAS scores, $r = .21, p < .01$. Finally, there was a slight positive association between smoking status and DAS scores, $r = .07, p = .05$.

Discussion

The first objective of this study was to apply Tversky and Kahneman's (1981) framing experiment to the issue of smoking. Decision frames were operationally defined as the decision makers mental conception of a positive versus a negative framed message offering a sure-thing and risk-seeking choice of acts, outcomes or contingencies. This study measured death anxiety for each of the four decision frames offered by smoking status.

The effect of framing on preference (i.e., preference reversal) are demonstrated by the results of the chi-square test. The statistical analysis suggested that there was a significant difference between framing treatments, both for males and females. Visual examination of the data show that the female data demonstrated a more extreme preference reversal than that presented for the males.

Reliability analysis of the Templer (1970) Death Anxiety Scale found that, for this sample, the measure of death anxiety proved reliable. Participants more accurately replicated the preference reversal effect than shown in Experiment 1 indicating that the investigation should progress onto exploration of objectives 2 and 3.

The second objective of the study was to explore decision frame preference between framing treatments as a potential mediating factor of death anxiety. As in Experiment 1 there was no evidence showing that death anxiety was significantly associated with participants' preference.

The third purpose of Experiment 2 was to explore the interactions between the two observable variables (i.e., decision frame preference and smoking status). Overall, when both male and female data was combined there were no significant

effects shown. Investigated separately by sex the results show that there was a significant three-way interaction for female smokers who received the negative framing treatment.

In this experiment the major contribution to knowledge is the significant three-way interaction for female smokers who received the negative framing treatment. The major finding here was that participants who preferred the sure-thing show significantly higher death anxiety than those who preferred the risk-seeking choice. This suggests that the choice to lose 300 women generated a higher death anxiety response than the choice whereby there was a $1/4$ probability that no women would die and $3/4$ probability that 400 women would die.

Experiment 3

Method

Participants

Data were collected from 1181 students attending the Churchlands, Mount Lawley and Joondalup campuses of Edith Cowan University during the month of October of 1995. Of the participants, 70.4% ($n = 831$) were female and 29.6% ($n = 350$) were male. The mean age for females was 25 years with a range from 18 years to 56 years. The mean age of the males was 23 years with a range from 18 years to 60 years.

Apparatus

Experiment 3 was conducted with a modified questionnaire content to maintain a more precise replication of Tversky and Kahneman's (1981) Asian disease experiment. This questionnaire consisted of three pages as follows:

1. a cover page similar to Experiment 2.
2. the modified replication of Tversky and Kahneman's (1981) Asian disease decision framing experiment with 1/3 probability for a population of 600 people on page one (see Figure 28 and Figure 29 in Appendix B).
3. the contents of page two were arranged similar to page two from Experiment 2.

The Templer (1970) Death Anxiety Scale along with the three demographic questions (i.e., sex, year of birth, major program of study) and two lifestyle questions (i.e., smoking status and number of cigarettes smoked per day).

Theoretical replication assessment. The same presentation of Tversky and Kahneman's (1981) Asian disease experiment vignette and decision choice was used worded for the issue of smoking. As explained above, the probability equation was

adjusted to 1/3 from a population of 600. This modification was justified after discovering a newspaper article advising Australians that one in three smokers will die from smoking related disease or illness.

The vignette on the Experiment 3 instrument was modified by the replacement of two vignette words to reflect Western Australian environmental and interaction variables. Two vignette words were replaced. 'US' was replaced with 'Australia' and 'Asian' was replaced with 'smoking-related'. It is noted that this experiment cannot be validated juxtaposed with the results from both the Experiment 1 and Experiment 2. This is because in Experiment 3, the word 'women' has been replaced with 'people', firstly, this was done due to the sourced newspaper article *Smokes to kill 1 in 3 - Study* being intended for a general population (Connolly, 1992). Secondly, Tversky and Kahneman's (1981) study utilised 'people' in their framing vignette.

It is also noted that this experiment is not an exact replication, however, with the exception of the country and issue of concern it is as close to the original as possible.

Assessment of death anxiety. As with Experiment 2 the 15 item true / false check list from the Templer (1970) DAS was used as an index measure of death anxiety. Tests of reliability (i.e., Cronbach's Alpha) for Experiment 1 and Experiment 2 show that this instrument has high internal consistency reliability. However, the unidimensionality (i.e., construct validity) of the DAS is doubtful because of low inter-item correlations as reported from Experiment 1 and Experiment 2. It is noted here that this thesis does not attempt to investigate the validity of the DAS other than to report significant effects as observed.

Design

A 2×2 (i.e., frame by preference) design, similar to that reported in Experiment 1, was used to investigate significant preference reversal effects. A $2 \times 2 \times 2$ (i.e., frame by preference by smoking status) non-orthogonal factorial ANOVA design, as was used in Experiment 2, was used for Experiment 3. Independent and dependent variables were the also same.

Procedure

Respective lecturers and tutors were again initially approached via either a flier or an e-mail notice seeking permission and cooperation to conduct the study during class contact time. Classes that had already participated in the study were excluded.

Pre-experimentally, participants were informed that information gained from the study would be used to develop better quality health promotions by examining how they deal with smoking in terms of choosing one of the two options presented. They were advised that their participation was entirely voluntary, was not a course requirement, and that their responses would be kept confidential according to Edith Cowan University ethical guidelines. Participants were asked to complete a paper and pencil self-report questionnaire that took between 5 to 10 minutes of their time to complete. Students were asked that if they had previously participated in the study in another class then they should not participate again in this class.

Students were non-randomly assigned to one of the independent treatment variables (i.e. either a positive frame or a negative frame). The questionnaires were handed out one positive then one negative and so on. Participants were instructed verbally and by overhead projector to read the information from the framing vignette

and answer the choice problem on page one of the questionnaire before completing the other questions. Post-experimentally, students were debriefed as to the overall context of the experiment. Thereafter, students were courteously thanked for their time. After collection of the self-report questionnaire, participant responses were classified into one of eight independent groups.

Data Analysis

The chi-square test of independence between the two variables were utilised to examine the relationships between the independent variables of frame (i.e., treatment) and preference choice (i.e., observational). Data was compared to Tversky and Kahneman's (1981) results. Tests for significant associations between the demographic variables of sex, age group and faculty of study were also explored and reported. Internal consistency reliability analysis (i.e. Cronbach's Alpha) was computed for the DAS.

Analysis of variance was used to examine the differences between the means for the observed independent variables (i.e. decision frame and smoking status) with the dependent variable being mean Death Anxiety Scale (Templer, 1970) scores.

Descriptive data for the sample was generated for comparison with data from other sources. All data were processed on IBM compatible computers with SPSS for Windows (SPSS Inc, 1993) software.

Limitations

Similar to Experiment 2, the first three limitations for Experiment 1 are applicable here.

The findings of Experiment 3 underscore the lack of predictive value of decision making. To better understand the effects of message framing and decision

making on death anxiety, future research is necessary. Additional research needs to examine message framing with a simulated health promotion offering one of five alternative messages. That is, one message positively framed with a sure-thing content, a second message with a positive risk-seeking content, the third message a negative sure-thing, the fourth a negative risk-seeking content. Finally, a fifth message whereby the content appears neutral similar to the moon illusion (Axelson & Glanz, 1995) as a control group. The moon illusion is a paragraph explaining how when the moon is closer to the horizon it appears larger than when it is higher in the sky. This procedure would be more likely to demonstrate the nature of death anxiety and would realistically represent how health promotions are presented to the general public at this point in time.

Results

Demographics

Table 7, Table 8 and Table 9 show the percentage and frequency responses and contrasts for Experiment 3 demographics. One thousand one hundred and eighty one participants from the Edith Cowan University campuses at Mount Lawley, Joondalup, and Churchlands volunteered for this experiment, 350 males and 831

Table 7

Age characteristics of Experiment 3 participants (N = 1181)

Variable	n	%	n	%	n	%
Age	Total		Male		Female	
18 - 24	818	69.3	269	76.9	549	66.1
25 - 34	217	18.4	60	17.1	157	18.9
35 - 44	115	9.7	18	5.1	97	11.7
45 - 54	27	2.3	2	0.6	25	3.0
55 - 64	4	0.3	1	0.3	3	0.4

females. The mean age of the sample participants was 24 years, with a range of 18 years to 60 years of age. The age range for males was 18 years through to 60 years and for females the range was 18 years through to 56years. The mean age of males was 23 years and for females the mean age was 25 years.

The majority of participants reported as attending the Faculty of Health and Human Sciences (\underline{n} = 514, 43.5%). The majority of these participants were attending the School of Nursing. Over 80% of participants were enrolled in either the Faculty of Health and Human Science, Faculty of Business (\underline{n} = 252, 21.3%) or Faculty of Arts (\underline{n} = 228, 19.3%).

The rank orders of participants' faculty of study results show that for this sample the majority of participants constitute a group that is or will be in almost daily contact with bereavement, dying and death (i.e., nursing). Thus it could be reasonable to predict that the majority of participants would have resolved to some extent the issues associated with death, dying and the care of terminally ill people.

Table 8

Experiment 3 Faculty of study demographics (N = 1181)

Variable	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Faculty	Total		Male		Female	
Health & Human Science	514	43.5	75	21.4	439	52.8
Business	252	21.3	126	36.0	126	15.2
Arts	228	19.3	54	15.4	174	20.9
Science, Technology & Engineering	143	12.1	81	23.1	62	7.5
Education	13	1.1	3	0.9	10	1.2
Not Stated	20	1.7	7	2.0	13	1.6
WA Academy of Performing Arts	11	0.9	4	1.1	7	0.8

Table 9

Smoking Status characteristics of Experiment 3 participants (N = 1181)

Variable	n	%	n	%	n	%
Smoking Status	Total		Male		Female	
Never Smoked	783	66.5	247	70.8	536	64.7
Former Smoker	236	20.0	60	17.2	176	21.2
Current Smoker	159	13.5	42	12.0	117	14.1

Among the female participants, 14.1% were current smokers, 21.2% were former smokers, while 64.7% reported being non-smokers. For the males, 12% were

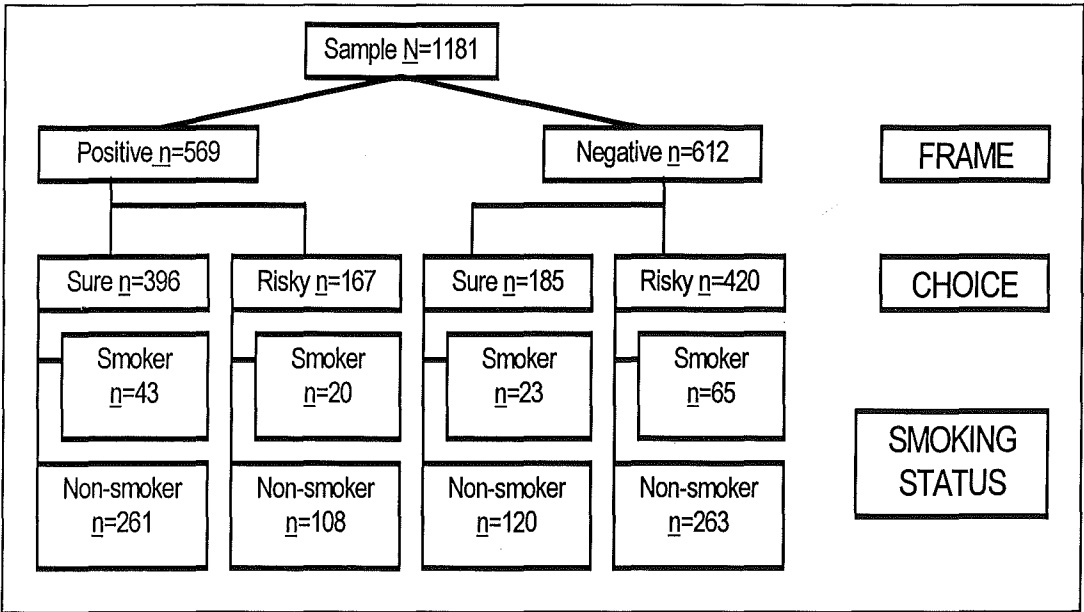


Figure 14. Breakdown relationship between the questionnaire frame, Preference and Smoking Status used to discriminate the sample into eight independent populations.

current smokers, 17.2% were former smokers, while 70.8% reported being non-smokers.

Message Framing

Again, student participants were selected by non-probability sampling methods and pseudo-randomly assigned to one of the independent treatment

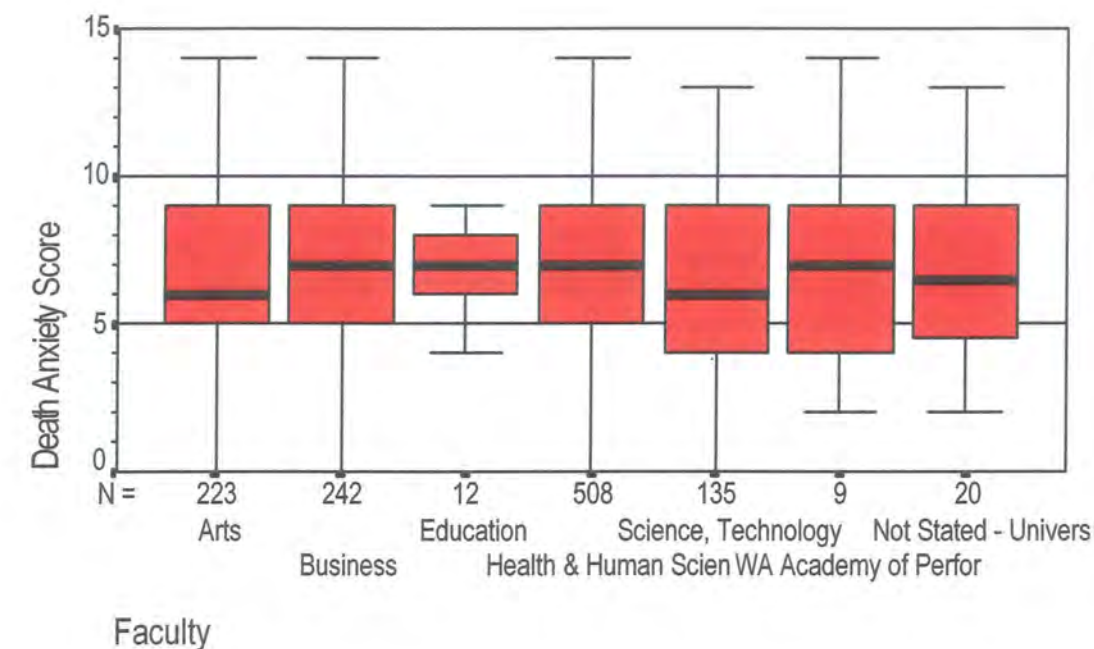


Figure 15. Experiment 3 SPSS chart of DAS mean scores by participants' Faculty of study.

variables. The positive and negative treatments were in turn divided according to the participants' preference choice between either a sure outcome or a risky outcome (Tversky & Kahneman, 1981). Similar to Experiment 2, the sample was further divided according to self-reported smoking status. Sample size and subsequent breakdown into eight independent groups for further analysis as illustrated in Figure 14. Looking at the number of participants who chose a sure-thing versus a risk-

Table 10

Frequency of Frame by Preference choice

Preference	Frame		Total
	Positive	Negative	
Sure-thing	396 (70.3%)	185 (30.6%)	581
Risk-seeking	167 (29.7%)	420 (69.4%)	587

seeking choice for the negative frame versus the positive frame it was evident that the expected preference reversal effect was observed.

Chi-square Test

A 2 X 2 chi-square test was performed, using SPSS for Windows, to test the replication of the preference reversal effect thereby adding support to prospect theory for decision frames with a smoking issue message. The data revealed a significant

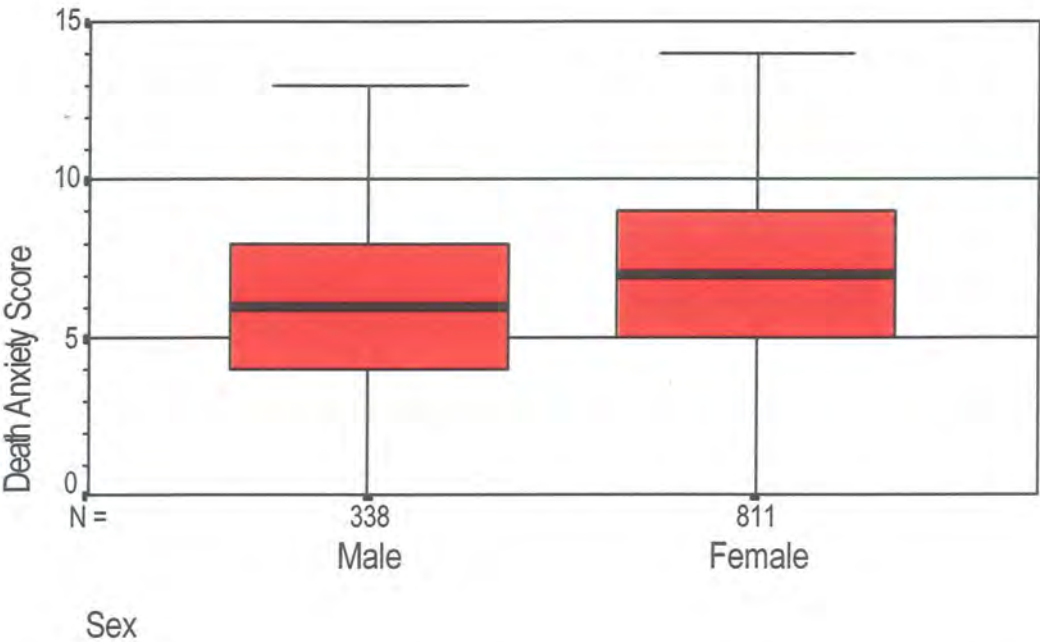


Figure 16. SPSS chart of DAS mean scores by participants' Sex for Experiment 3.

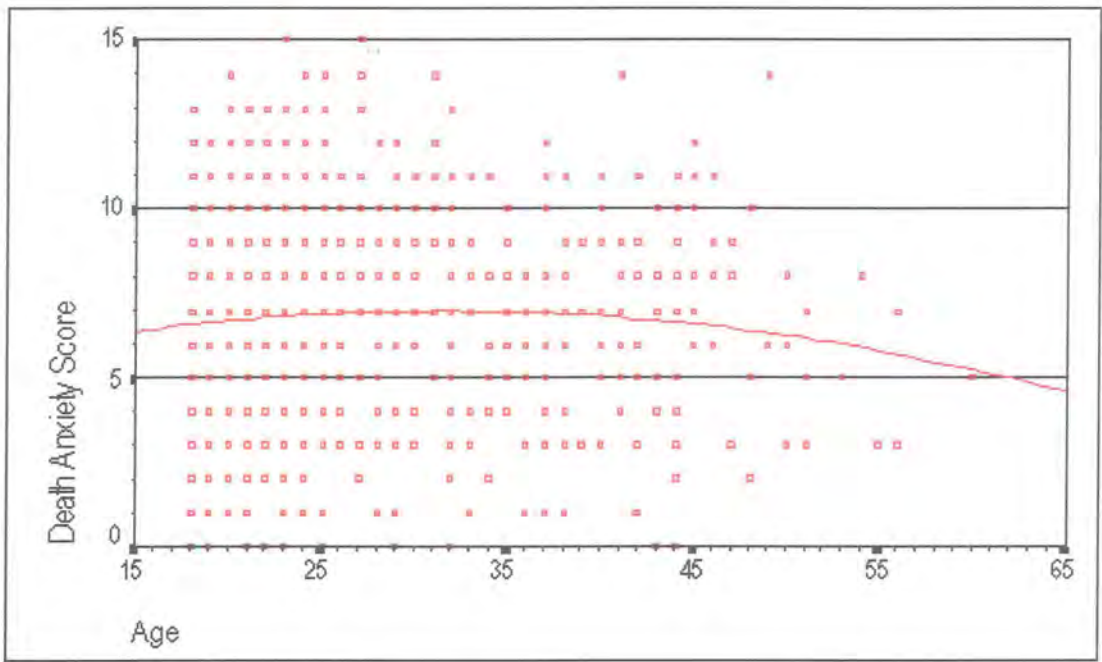


Figure 17. SPSS chart of DAS mean scores by participants' Age for Experiment 3.

relationship between framing and preference. Both the negative and positive frames were different for the two types of preference, $\chi^2(1, N = 1168) = 182.8, p < .001$.

The frequencies are shown in Table 10. There was a great deal of difference in the proportion of participants who preferred the sure-thing in the positive frame compared to participants who preferred the sure-thing in the negative frame. Of the 48.2 % who received the positive frame, 70.3 % preferred the sure-thing option whereas 29.7% preferred the risk-seeking option. Of the 51.8% of participants who received the negative frame, 30.6% chose the sure-thing option and 69.4% chose the risk-seeking option. For the 1181 participants in this experiment, six who received the positive frame failed to choose one of the options, as did seven who received the negative frame. These cases were counted as missing from the analysis.

Death Anxiety

Firstly, the 15 items from Templer's (1970) DAS once again showed satisfactory internal consistency reliability (Cronbach's Alpha, $\alpha = .68$). In this experiment, similar to the Experiment 1 and Experiment 2, the inter-correlations among some of the 15 DAS items were less than satisfactory.

The cell DAS means for each faculty were Arts: $\underline{M} = 6.53$, $\underline{SD} = 2.89$, Business: $\underline{M} = 6.82$, $\underline{SD} = 3.24$, Education: $\underline{M} = 7.00$, $\underline{SD} = 2.17$, Health and Human Science: $\underline{M} = 6.95$, $\underline{SD} = 2.88$, Science Technology and Engineering: $\underline{M} = 6.31$, $\underline{SD} = 2.79$, and WA Academy of Performing Arts: $\underline{M} = 7.22$, $\underline{SD} = 3.87$.

Females were more death anxious ($n = 831$, $\underline{M} = 7.04$, $\underline{SD} = 2.88$, $\underline{CI} = 6.84$, 7.24) than males ($n = 350$, $\underline{M} = 6.11$, $\underline{SD} = 3.95$, $\underline{CI} = 5.79$, 6.44). The mean death anxiety score for female participants who were current smokers was $\underline{M} = 6.84$ ($\underline{CI} = 6.37$, 7.33), former-smokers show a $\underline{M} = 6.76$ ($\underline{CI} = 6.32$, 7.20), and $\underline{M} = 7.16$ ($\underline{CI} = 6.91$, 7.41) for females who were never-smokers. For male participants who reported as being current smokers the mean death anxiety score was $\underline{M} = 6.62$ ($\underline{CI} = 5.76$, 7.48), former-smokers show a $\underline{M} = 6.26$ ($\underline{CI} = 5.37$, 7.14), and $\underline{M} = 6.00$ ($\underline{CI} = 5.61$, 6.39) male never-smokers.

Similar to Experiment 2, younger and older participants show slightly lower death anxiety trend than participants who were middle aged.

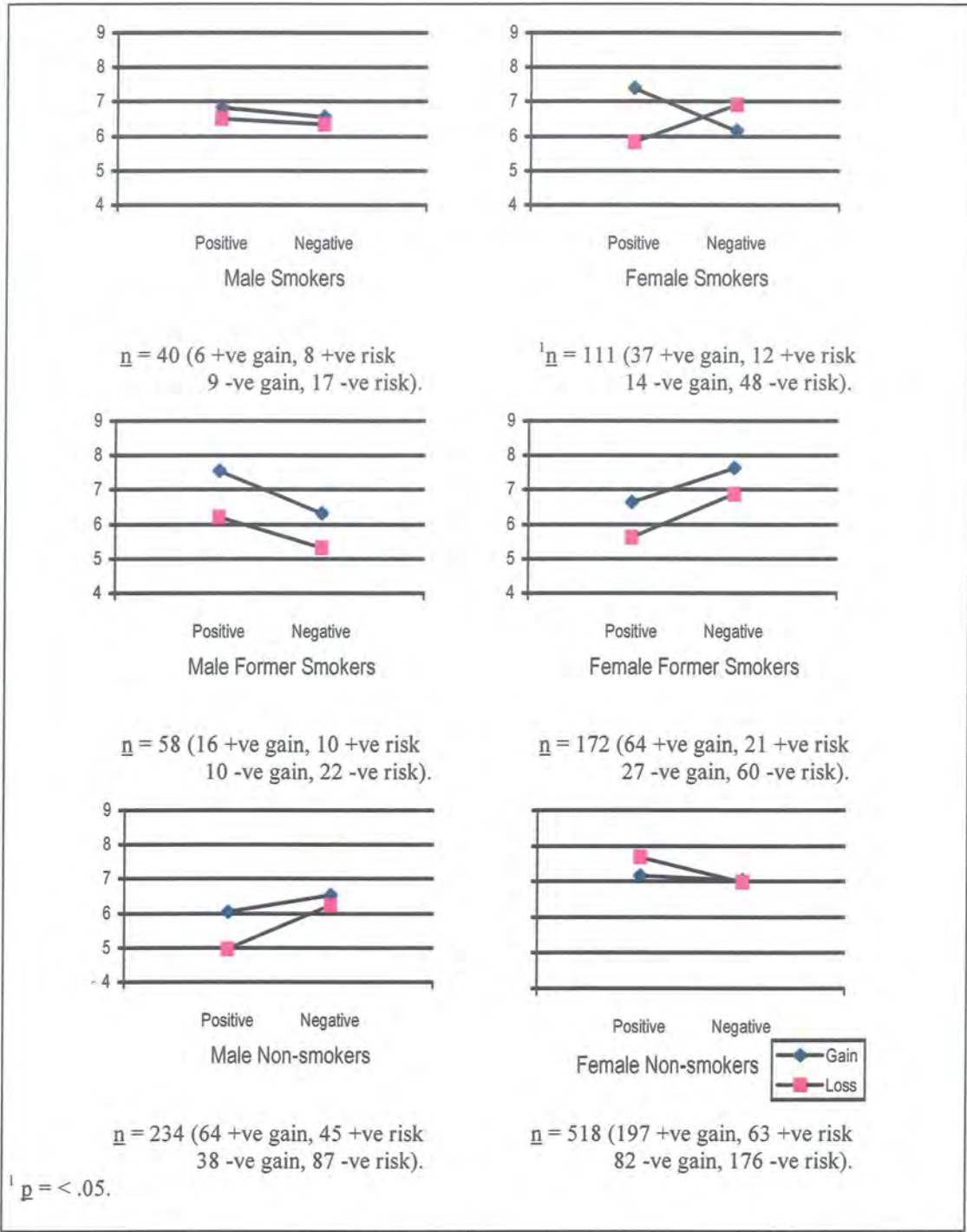


Figure 18. Frame X Preference X Smoking Status using mean DAS scores for smokers, former smokers and non-smokers.

The mean death anxiety score for participants in the 18 - 25 year age group was $\underline{M} = 6.74$ ($\underline{CI} = 6.54, 6.95$). For the 35 - 34 year age group the death anxiety mean score was $\underline{M} = 6.88$ ($\underline{CI} = 6.46, 7.31$), 35 - 44 was $\underline{M} = 6.60$ ($\underline{CI} = 6.05, 7.15$), 45 - 54 was $\underline{M} = 7.33$ ($\underline{CI} = 6.17, 8.49$) , 55 - 64 was $\underline{M} = 4.50$ ($\underline{CI} = 1.45, 7.55$).

Analysis of Variance

Using SPSS for Windows, a 2 X 2 X 2 (i.e., frame by preference by smoking

Table 11

Mean DAS scores as a function of Frame, Preference and Smoking Status for female participants

Smoking Status	Positive		Negative		Total
	Sure	Risk	Sure	Risk	
	<u>M</u>	<u>M</u>	<u>M</u>	<u>M</u>	<u>M</u>
Never-smoked	7.15	7.68	7.04	6.99	7.14
Former-smoker	6.64	5.62	7.63	6.88	6.76
Current-smoker	7.38	5.83	6.14	6.90	6.85

status) non-orthogonal factorial ANOVA was performed on the DAS index. The assumptions of ANOVA were deemed satisfactory. Main effects and interaction were found to be satisfactory for females only: Frame by Preference by Smoking Status, $F(1, 628) = 4.17, p < .05$). Descriptive statistics are given in Table 11, and the interaction is shown in Figure 18.

An independent t test was computed on the DAS, using SPSS for Windows. Because of violation of the assumption of homogeneity of variance the t test for

unequal variances was computed. The results indicated a significant difference between female smokers who received the positive frame and chose the sure-thing option and female smokers who received the positive frame and chose the risk-seeking option, $t(27.16) = 2.07, p < .05$. The mean DAS score for the sure-thing group was 7.38 ($SD = 2.88$), compared to 5.83 for the risk-seeking group ($SD = 1.99$).

The question of interest is whether the significant interaction observed for female smokers who received the positive framing treatment is related to the questionnaire being modified. That is, to a non-gender specific content (e.g., from 'women' to 'people'), or being due to the modified probability value (e.g., from '1/4' to '1/3').

Discussion

Extensive data were collected for this experiment from 831 female participants, and 350 male participants. From the total sample of 1181 participants, evidence was gathered to demonstrate that the reversal of preference effect across different frames, as discussed by Tversky and Kahneman (1981), can be extrapolated to the value of sure-thing and risk-seeking decision frames for the issue of tobacco smoking. The degree of preference reversal for the total sample shows that for the positive frame, 70.3 percent of participants chose the sure-thing option while 29.7 percent chose the risk-seeking option. Juxtaposed with the data for the negative frame, 30.6 percent of participants chose the sure-thing choice while 69.4 percent chose the risk-seeking option. In contrast to Experiment 1 and Experiment 2, this clearly demonstrates that the reversal of preference effect reported by Tversky and Kahneman was replicated under the experimental conditions for this sample. The

anomalous results in Experiment 1 and Experiment 2 are thought to be attributable to questionnaire layout and questionnaire gender bias respectively.

Overall reliability of the Templer (1970) Death Anxiety Scale was empirically established, however, the majority of the DAS inter-item correlations remain low for all three experiments. The unidimensionality or multi-factorial status of the DAS (Templer, 1970) remains equivocal.

Evidence that framing and preference mediates death anxiety, for participants making decisions under risk, was not found. Thus, as with Experiment 1 and Experiment 2, the death anxiety factor as an assumed component, does not adequately capture the explanation of self-control as an alternative when applied to the preference reversal phenomenon. As a theoretical foundation for rational decision making under risk for prospect theory the preference reversal phenomenon remains an issue of controversy.

The main effect shown from the three-way analysis of variance for the female smokers who received the positive frame reveal significant interaction. For female smokers who received the positive framing treatment, participants who chose the sure-thing decision frame had significantly higher death anxiety than female smokers who received the positive frame and chose the risk-seeking option. The significant framing effects for female smokers reported in Experiment 2 were reversed for this sample.

There are two possible explanations for this inconsistency. Firstly, the logic and validity of the argument for participants' involvement in the issue can be vigorously discussed and debated. Experiment 3 was worded in terms of a non-specific target group (e.g., neither male nor female) thus there were no gender

stereotypes promoted to reinforce participant decision making. Secondly, in terms of professional lifestyles and philosophies, the majority of participants in Experiment 3 reported attending the Faculty of Health and Human Science (i.e., School of Nursing) and thus may have given more attention to ethical responsibilities associated with the positive frame (e.g., lives saved) as a priority agenda.

General Discussion

There were three objectives for the experiments conducted for this thesis. The first objective was to demonstrate, for the issue of tobacco smoking, a replication of the preference reversal phenomenon as cited from Tversky and Kahneman's (1981) Asian disease decision framing study. Efforts to explore framing for lives saved versus lives lost to establish peoples' preference between certain and risky outcomes was not successful in Experiment 1 because the questionnaire layout acted as a confounder. The modified replication of decision framing in Experiment 2 and Experiment 3 were significant. These results are encouraging, demonstrating a preference reversal effect for the issue of tobacco smoking. Thus, framing for the issue of tobacco smoking for university students is generalisable to the preference reversal axiom of Prospect Theory.

These consistencies and differences reflect the diverse intellectual influence of message framing whereby decision frames between framing treatments, which are worded in terms of the same expected utility, violate normal principles of rational decision making. This deviation from the rational norm could be regarded as a flaw or error of reasoning (Kahneman & Tversky, 1979; Tversky, Slovic & Kahneman, 1990). The results of Experiment 3 clearly demonstrate the fact that a sample thought to consist of "rational" people do not automatically abide by the principles of rational decision making.

Arguably, related research findings show significant preference reversal effects for diverse issues (e.g., Fischhoff, 1983; Levin & Chapman, 1990) and in light of these findings, preference reversal has been discussed and interpreted relative and indicative to different situations. Alternatively, it could be argued, that the

“issue” itself was not the predominant feature of framing, rather, the variations of preference expressed between framing conditions may be due to the investigator’s application and confirmation of Tversky & Kahneman’s (1981) research design.

Perhaps the most obvious demonstration of this argument is found in the design from Experiment 3, whereby two words out of 87 words were substituted into Tversky and Kahneman’s Asian disease framing vignette. Although the language can be used to express another “issue”, 97.70% of Tversky and Kahneman’s technique didn’t change. From a psychological point of view, was it the unchanged 97.70% that weighed in the balance vis-a-vis preference reversal, or was it the 2.30% change (i.e., the issue)? Although this question arises in terms of arguments and confidence for the results obtained, it was not the intent of this thesis to consider and establish which part or links to Tversky and Kahneman’s research design weighed more in the balance in decision making.

The second objective of this thesis was to explore self-reported death anxiety as a mediating factor in the decision frame preference equation. The findings of the three experiments within this thesis provide no support for the hypothesis that overall framing and decision making are influential or mediate death anxiety. The findings suggest instead that when experimental control variables (e.g., Sex, Faculty of study, Age, Smoking Status and Number of Cigarettes Smoked) are arranged to minimise influences on the dependent variable (i.e., Death Anxiety), then there are moderate differences for these control variables (Shavelson, 1988). This raises the question of whether it is possible to devise a new risk measure that reflects people’s self-control better. It is acknowledged that death anxiety could be viewed as only a small part of a

more complex self-control concept. Given the results reviewed above, it is possible to propose some conclusions.

Firstly, it is demonstrated that for male non-smokers who received a negatively framed treatment there is a trend for higher DAS scores compared to male non-smokers who received the positive treatment. These trends are reversed for male former smokers and current smokers (i.e., male former smokers and male current smokers who received the negative frame treatment tended to have lower DAS score than those who received the positive treatment). There are concerns about the validity of this trend as for some cells the number of observations was less than ten (Shavelson, 1988). This trend was present for both Experiment 2 and Experiment 3. Female data do not show this trend, especially female smokers. This is quite good empirical evidence to suggest that, at a group level, male non-smokers perception of the decision frame problem is not the same as for male smokers and former-smokers. This finding adds an original contribution to the smoking debate and therefore shows a clear need for further research and refinement of decision-making models between the aforementioned groups.

Secondly, it was expected that mean death anxiety scores for participants' sex would be lower for males and higher for females (Stevens, Cooper & Eugene-Thomas, 1980; Templer, 1970; Templer & Ruff, 1971; Warren & Chopra, 1979). One could well conclude that the data from all three experiments conducted for this thesis supported the aforementioned pattern of DAS score distributions. This finding is an interesting and useful contribution to the literature on the influence of sex on Templer's DAS. There are, fortunately, social psychological explanations and a large body of knowledge showing that gender-based stereotypes account for differences

between the sexes whereby males are assumed to be particularly subject to exhibiting traits associated with risk-seeking behaviour (Baron & Byrne, 1994).

Several studies have reported small but significant relationships between major area of study and death anxiety. Non-significant relationships have also been indicated (Lonetto & Templer, 1983). To summarise the results, Experiment 1 shows a trend for lower death anxiety for participants studying in the helping professions. Inconsistent with the results of Experiment 1, Experiment 2 and Experiment 3 do not show this trend. Unfortunately, the research data presented in this thesis offer no additional information to support or refute historical findings showing a relationship between area of study and death anxiety.

Small but significant differences in age and death anxiety shown in the three studies undertaken as part of this thesis support previous research (Neimeyer, 1994). A major contribution is the slightly higher mean death anxiety shown for middle age participants compared to younger and older participants. There are two explanations for this finding. Firstly, younger people view death as a distant event (e.g., death is always at a far-off chronological distance), and so discount the concept together with any anxiety in relation thereto. Secondly, older people, characterised as being self-actualising, have learned that death is inevitable and naturally unavoidable. Through self experiences older people come to a realisation of the aforementioned and treat the notion of death with congruence.

The third objective of this research thesis, to examine the differences between positive and negative decision frames by smokers and non-smokers, show significant main effects for both Experiment 2 and Experiment 3. Females who were current smokers in Experiment 2 show significant interaction effects. If the participant was

in the female non-smoker group, there is no difference in death anxiety, between choosing either the sure-thing option and risk-seeking option for both positive and negative frames. However, for the female current smoker group, there is no difference in death anxiety between choosing a sure-thing or risk-seeking decision frame in the positive frame. Female current smokers choosing the sure-thing in the negative frame show significantly higher death anxiety than female current smokers choosing a risk-seeking option in the negative treatment. This interaction does not occur for males.

The results of Experiment 3 indicate that for female current smokers receiving the negative frame, there is no difference in death anxiety with the choice of either a sure-thing or risk-seeking option. Whereas female current smokers receiving the positive frame treatment and preferring the sure-thing option had higher death anxiety than female current smokers presented with the positive frame and preferring the risk-seeking option. These findings were for female participants only.

For women, it appears that simply offering a smoking-related decision frame choice elicits palpable negative affect responses and positive affect responses compared to men. Although the data presented in this thesis are only suggestive, it could be argued that the large number of public anti-smoking campaigns targeting women have amplified mixed feelings among women, but only among women for whom the issue has relevance. A point of interest worth mentioning is that there were no public anti-smoking campaigns targeting men at the time of conducting this research thesis. As argued by Rothman, Salovey, Antone, Keough and Drake-Martin (1993), in their attempt to identify the reliability of differently framed skin cancer health promotion pamphlets, “gender was a reasonable proxy for degree of issue

involvement” (p. 421). Women show greater concern for the issue of sun tanning and skin cancer as compared to men. The results of this thesis show that, when exposed to differently framed smoking-related messages, the likelihood of predicting preferences of women smokers and the consequential relevance (i.e., issue involvement) of the issue to the individual is a topic requiring supplementary research.

There are some limitations of this research. First, given that all participants were university students, the research will need to be replicated in other representative and more generalised groups. Secondly, the framing vignette and preference of program represent a choice not normally made by individuals. Choices of health promotion campaigns, and communication campaign content, are usually made by health promoters. Further, the results cannot be generalised to suggest that an individual may act in any particular manner or prefer a particular outcome. Thirdly, this thesis explored one aspect of the way in which non-smoking behaviour is socially conditioned, it does not reduce the individual to an automated response set. Smoking behaviour can be promoted by other social, cultural, psychological, biological, and environmental interactions.

As a result of these experiments there is additional evidence supporting the preference reversal effect between positive and negative decision frames for the issue of tobacco smoking. By implication there is also new knowledge available to health professionals regarding negative and positive content of messages modelled in ways which parallel anti-smoking campaigns.

Implications For Anti-smoking Health Promotions.

Additional support for health promotion message framing and smoking-related decision making could be interpreted from the Frame X Preference X Smoking Status interaction effect as evidence of issue involvement. Although the data from the experiments within this research thesis of message framing may be consistent with either research method replication or issue involvement interpretations, there are some problems with the latter analysis of the data. First, issue involvement assumes that an individual processes information systematically, and that negatively framed information under conditions of high involvement are more effective. Second, there is no evidence to support issue involvement enhances or suppresses ‘the differential effects of message framing on health behaviour’ (Rothman, Salovey, Antone, Keough and Drake-Martin, 1993, p. 415).

The National Tobacco Health and Information Campaign is an Australian national campaign. The purpose of the campaign is to “force smokers to confront the dangers of their habit...trying to reach both smokers and potential smokers with this information” (Lawrence, 1994) with the long-term aim of alerting smokers of the health effects of smoking.

This thesis was as much concerned with the message content of the National Tobacco Health and Information Campaign advertising strategy content as it is with an atheoretical exploration of health promotion message framing, decision making, smoking behaviour and death anxiety. To access the generalisability of the results of this research thesis it will be necessary to carry out similar research with a random cross-sectional sample of the general Australian population to continue to learn more about why health promotion campaigns work, when, and why. As a demonstration, health promotion practitioners might give special attention to process evaluations

addressing specific aspects of the manner in which health promotion messages are framed, in particular when the message content is worded in terms of lives saved versus lives lost. This form of formative evaluation might be included in addition to the customary impact evaluations (e.g., monitoring the numbers and frequency of brochures distributed or phone calls received to dedicated telephone numbers, persons reporting quitting smoking, advertising message recall, persons utilising quit services or observed structural changes to the environment).

Through the utilisation of the results extracted from this research thesis, health promotion practitioners assigned with the responsibility might make better decisions and judgements about planning their advertising, health promotion, service or ideas, and message evaluations. The results of the two experimental studies provide support for the proposition that the extent to which the frame of anti-smoking related health promotion communications moderates the decision making and death anxiety markedly differentiates according to sex and smoking status. The experiments show that anti-smoking related health promotion messages presenting information of equal expected value in a positive direction (i.e., concerning gains) or in a negative direction (i.e., concerning losses) systematically influences the outcome of decisions. In the positive framed decision frames the majority choose the risk-less option which highlights lives saved. In contrast, in the decision frames highlighting lives lost, the majority chose the risky option. Since the two versions contain information of equal expected value, this represents inconsistent behaviour violating the principles of rationality.

As more is learned about the inadvertent and unintended cultural effects of negatively framed campaigns, health promotion practitioners both individually and

collectively have, with all honesty, the obvious responsibility to accept reprehension for naivete to an awareness of such cultural change. When health promotion professionals and anti-smoking health campaign planners construct anti-smoking messages there will always be some degree of uncertainty concerning the effects that the communication will produce. For the most part, anti-smoking communication campaigns may effect the message recipient with desirable or undesirable outcomes. Additional research needs to examine the links between health promotion message frame and outcomes, which affect the values of the recipient in a variety of situations and degrees of issue involvement.

The theoretical framework explored with this thesis show that death anxiety is a factor for consideration when anti-smoking health information planning strategies are used in a negative fear arousing communication (i.e., a negative frame). There is a risk inherent to fear appeals in that they may unwittingly lead to unpleasant connotations for the individuals receiving and perceiving the message (Janis & Feshbach, 1953). Too fearful or thanatologic a “promotion” may not only fail to gain compliance from a potential target audience, it may unfavourably influence the credibility of the message source.

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Appendices

Appendix A

Examples of negatively framed anti-smoking health promotions.

Appendix B

Examples of the research study questionnaires used for this thesis.

Appendix A

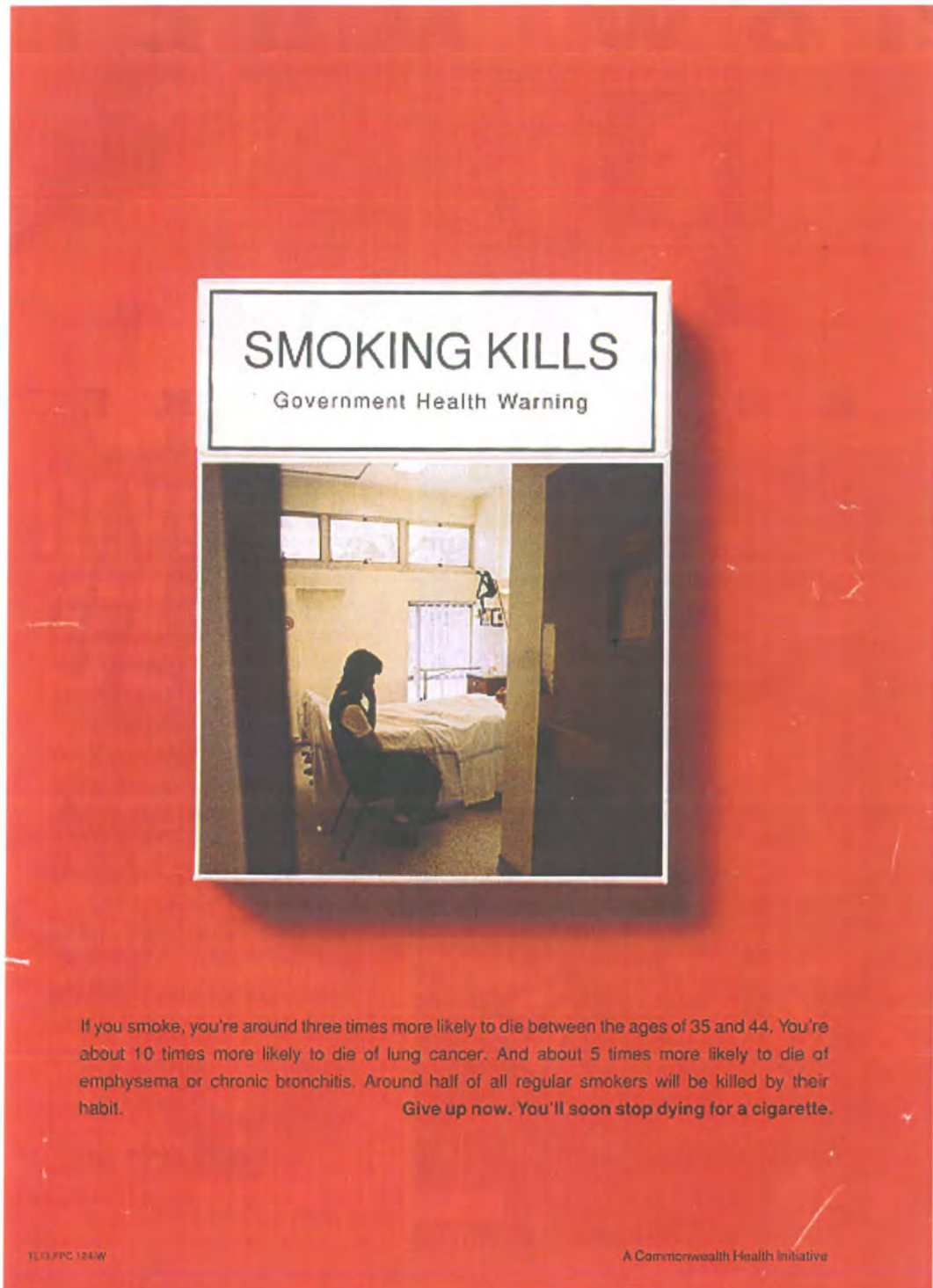


Figure 19. An example of negatively framed anti-smoking health promotions that use a sure-thing (e.g. SMOKING KILLS) and risky option (e.g. Around half of all regular smokers will be killed by their habit). *Note:* The advertisement was a Commonwealth Health Initiative, 1995, *Who Weekly*, 154, p. 73. Reproduced without permission of the author for educational review.



Figure 20. An example of negatively framed anti-smoking health promotions that use a sure-thing (e.g., SMOKING WHEN PREGNANT HARMS YOUR BABY) and risky option (e.g., ...remember that smoking kills around half of all regular smokers). *Note:* The advertisement was a Commonwealth Health Initiative, 1995, *The Australian Women's Weekly*, March 1995, p. 231. Reproduced without permission of the author for educational review.

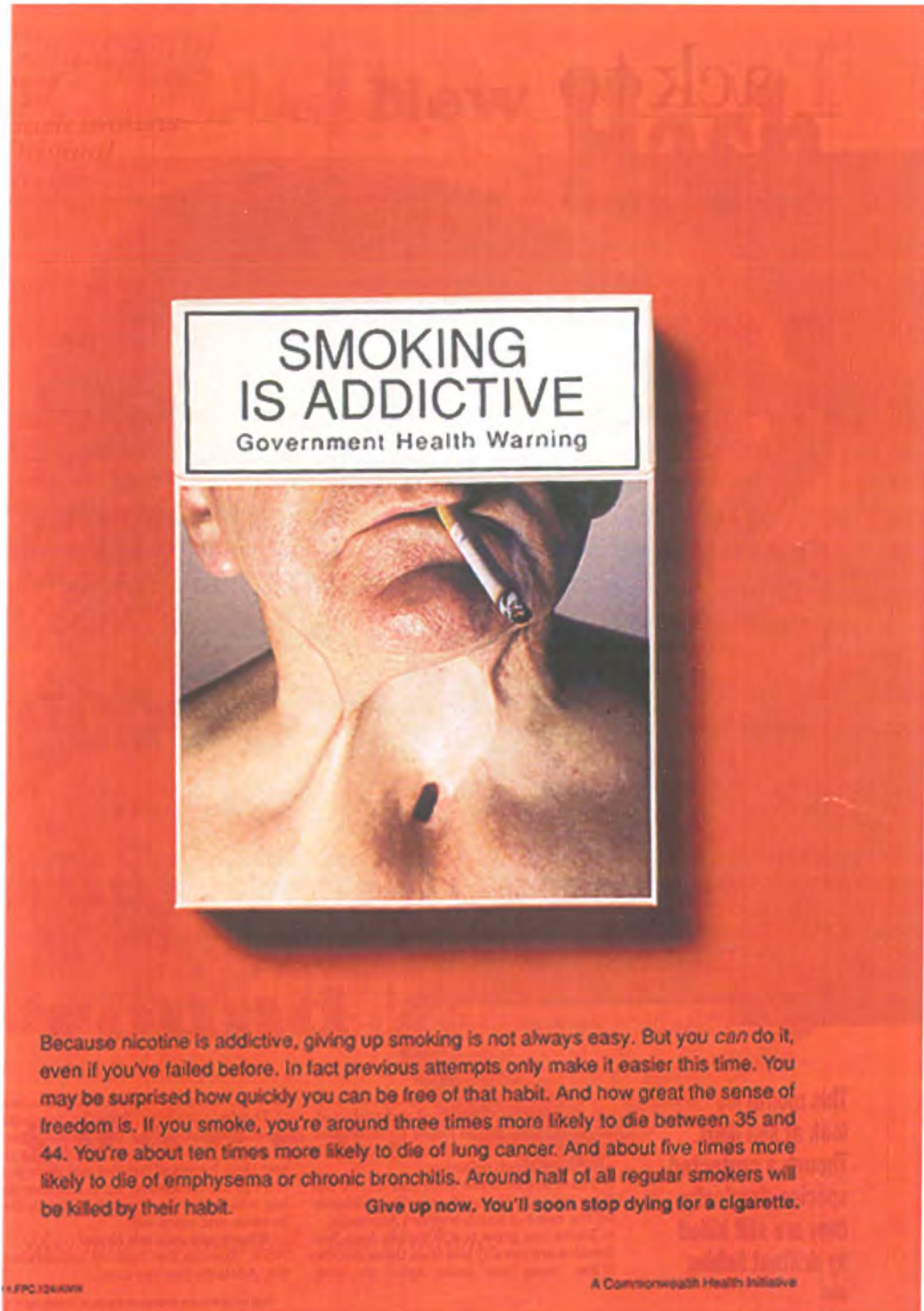


Figure 21. An example of negatively framed anti-smoking health promotions that use a sure-thing (e.g., **SMOKING IS ADDICTIVE**) and risky option (e.g., ...Around half of all regular smokers will be killed by their habit). *Note:* The advertisement was a Commonwealth Health Initiative, 1995, *The Australian Women's Weekly*, February 1995, p. 255. Reproduced without permission of the author for educational review.

Appendix B

SMOKING STUDY QUESTIONNAIRE

Dear Participant,

My name is Ian Parker and I am an Honours student at Edith Cowan University. I am conducting an inquiry into smoking, health and related factors. One of the aims of the study is to research effective health promotion techniques. I would be grateful if you could voluntarily complete this anonymous questionnaire on smoking. Your responses will be treated in strict confidence in accordance with Edith Cowan University ethical guidelines. Returning the blank questionnaire will indicate to the researchers that you do not wish to participate.

Figure 22. Instructions used for Experiment 1.

1. WHAT SEX ARE YOU? (Place a tick ☒ in ONE box only).

☐ Male

☐ Female

2. WHAT IS YOUR AGE? (Write your age here).

3. WHAT IS YOUR MAJOR PROGRAM OF STUDY? (Write your undergraduate major here).

4. WHICH OF THE FOLLOWING BEST DESCRIBES YOU? (Place a tick ☒ in ONE box only).

☐ A current smoker

☐ A former smoker

☐ Never smoked

5. IF YOU CURRENTLY SMOKE, HOW MANY CIGARETTES DO YOU SMOKE PER DAY? (Write a number here).

Figure 23. Three demographic and two lifestyle questions used for Experiment 1, Experiment 2 and Experiment 3.

READ THE PARAGRAPH BELOW. CHOOSE ONE PROGRAM FROM THE TWO ALTERNATIVES AS APPLIED TO YOU. (Place a tick ☒ in ONE box only).

Imagine that Western Australia is preparing for the outbreak of an unusual smoking-related disease, which is expected to kill 400 women. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

- if program **A** is adopted, 100 women will be saved.
- if program **B** is adopted, there is 1/4 probability that 400 women will be saved, and 3/4 probability that no women will be saved.

WHICH OF THE TWO PROGRAMS DO YOU FAVOUR? **A** ☐ **B** ☐

Figure 24. Positive smoking vignette and decision frames used for Experiment 1.

READ THE PARAGRAPH BELOW. CHOOSE ONE PROGRAM FROM THE TWO ALTERNATIVES AS APPLIED TO YOU. (Place a tick ☒ in ONE box only).

Imagine that Western Australia is preparing for the outbreak of an unusual smoking-related disease, which is expected to kill 400 women. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

- if program **A** is adopted, 300 women will die.
- if program **B** is adopted, there is 1/4 probability that no women will die, and 3/4 probability that 400 women will die.

WHICH OF THE TWO PROGRAMS DO YOU FAVOUR? **A** ☐ **B** ☐

Figure 25. Negative smoking vignette and decision frames used for Experiment 1.

IF A STATEMENT IS TRUE OR MOSTLY TRUE FOR YOU TICK THE TRUE BOX. IF A STATEMENT IS FALSE OR MOSTLY FALSE FOR YOU TICK THE FALSE BOX. (Place a tick ☐ in ONE box only for each statement, either True or False).

- | | | |
|-------------------------------|--------------------------------|---|
| True <input type="checkbox"/> | False <input type="checkbox"/> | I am very much afraid to die. |
| True <input type="checkbox"/> | False <input type="checkbox"/> | The thought of death seldom enters my mind. |
| True <input type="checkbox"/> | False <input type="checkbox"/> | It doesn't make me nervous when people talk about death. |
| True <input type="checkbox"/> | False <input type="checkbox"/> | I dread to think about having to have an operation. |
| True <input type="checkbox"/> | False <input type="checkbox"/> | I am not at all afraid to die. |
| True <input type="checkbox"/> | False <input type="checkbox"/> | I am not particularly afraid of getting cancer. |
| True <input type="checkbox"/> | False <input type="checkbox"/> | The thought of death never bothers me. |
| True <input type="checkbox"/> | False <input type="checkbox"/> | I am often distressed by the way time flies by so very rapidly. |
| True <input type="checkbox"/> | False <input type="checkbox"/> | I fear dying a painful death. |
| True <input type="checkbox"/> | False <input type="checkbox"/> | The subject of life after death troubles me greatly. |
| True <input type="checkbox"/> | False <input type="checkbox"/> | I am really scared of having a heart attack. |
| True <input type="checkbox"/> | False <input type="checkbox"/> | I often think about how short life really is. |
| True <input type="checkbox"/> | False <input type="checkbox"/> | I shudder when I hear people talking about World War III. |
| True <input type="checkbox"/> | False <input type="checkbox"/> | The sight of a dead body is horrifying to me. |
| True <input type="checkbox"/> | False <input type="checkbox"/> | I feel that the future holds nothing for me to fear. |

Figure 26. *The Templer (1970) Death Anxiety Scale used for Experiment 1, Experiment 2 and Experiment 3.*

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DEPARTMENT OF HEALTH STUDIES

**PLEASE DO NOT TURN OVER THE PAGE
UNTIL ASKED TO DO SO**

Figure 27. *Cover page as used for Experiment 2 and Experiment 3.*

READ THE PARAGRAPH BELOW. CHOOSE ONE PROGRAM FROM THE TWO ALTERNATIVES AS APPLIED TO YOU. (Place a tick ☒ in ONE box only).

Imagine that Australia is preparing for the outbreak of an unusual smoking-related disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

- if program A is adopted, 200 people will be saved.
- if program B is adopted, there is 1/3 probability that 600 people will be saved, and 2/3 probability that no people will be saved.

WHICH OF THE TWO PROGRAMS DO YOU FAVOUR? A ☐ B ☐

Figure 28. *Positive smoking vignette and decision frames used for Experiment 3.*

READ THE PARAGRAPH BELOW. CHOOSE ONE PROGRAM FROM THE TWO ALTERNATIVES AS APPLIED TO YOU. (Place a tick ☒ in ONE box only).

Imagine that Australia is preparing for the outbreak of an unusual smoking-related disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

- if program A is adopted, 400 people will die.
- if program B is adopted, there is 1/3 probability that nobody will die, and 2/3 probability that 600 people will die.

WHICH OF THE TWO PROGRAMS DO YOU FAVOUR? A ☐ B ☐

Figure 29. *Negative smoking vignette and decision frames used for Experiment 3.*