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Making the decision to purchase health supplement products: a study of consumer behaviour

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Making the Decision to Purchase Health Supplement Products: A Study of Consumer Behaviour

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Abstract

Health Supplement Products (HSPs), a form of Complementary and Alternative Medicine (CAM), have become increasingly popular in Western societies. Despite their widespread usage, the issue of why some people purchase HSPs and others do not is poorly understood. In part, this is due to limited research: few CAM studies have utilised consumer behaviour perspectives or have applied the Health Belief Model (HBM) in explaining and predicting the purchase of HSPs.

A conceptual model and twelve research hypotheses were developed from the findings of preliminary qualitative research (in-depth interviews with 65 adults) and a review of the literature regarding CAM and the HBM. The criterion variable used in the conceptual model was the 'likelihood of a consumer purchasing an HSP'. The predictor variables comprise 'perceived value of HSPs', 'perceived general health threats', 'external cues to action', five personality traits, and three socio-demographic variables.

The research hypotheses were tested in a nation-wide mail survey (n = 974) targeting Australian adults. The data so collected was analysed using *multiple regression* and *logistic regression*. The most powerful predictors of the 'likelihood of a consumer purchasing an HSP' were 'perceived value of HSPs' and 'external cues to action'. Of the personality traits, three - 'holistic orientation', 'internal health locus of control' and 'openness to experience' - showed positive correlations with the perceived value of HSPs. It was also found that the direct effects of these three personality trait variables on HSP purchase propensity were mediated through consumers' perception of the value of HSPs. Women and those between the ages of 35 and 44 years were more likely to

purchase HSPs, whereas the level of education did not have a significant effect. The conceptual model predicted 80% of the responses on the criterion variable correctly.

These findings have implications for consumer decision-making, both in the fields of health-care marketing and more broadly in health behaviour management. They are therefore relevant for marketing managers in the HSP industry, health-care practitioners, health-care educators, and health-care policy-makers.

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[1] Seong S. Yang, Lesley White, and Paul K. Couchman, *An Exploration of The Factors Affecting Consumers' Decision Making Regarding Alternative Medicines*, Proceedings of the Decision Sciences Institute, page 1197, San Francisco, California, the U.S.A. 17-20th Nov, 2001 (CD-ROM).

Table of Contents

List of Tables

List of Figures

List of Abbreviations

CAM(s)	Complementary and Alternative Medicine(s)
CHCF	Complementary Healthcare Consultative Forum
CHLC	Chance Health Locus of Control
CM	Conventional Medicine
CMEC	Complementary Medicines Evaluation Committee
DSHEA	Dietary Supplement Health and Education Act 1994 (in the U.S.A.)
HSP(s)	Health Supplement Product(s)
HBM	Health Belief Model
HLC	Health Locus of Control
IHLC	Internal Health Locus of Control
MHLC	Multi-dimensional Health Locus of Control
NIH	National Institute of Health (in the U.S.A.)
NUD*IST™	Non-numerical Unstructured Data Indexing Searching, and Theorising
OAM	Office of Alternative Medicine (in the U.S.A.)
OCM	Office of Complementary Medicines (in Australia)
OTC	Over The Counter
PHLC	Powerful Others Health Locus of Control
PGHT	Perceived General Health Threats
SJW	Saint John's Wort, a herb used for depression
TFH	Touch for Health, a form of Therapeutic Touch Healing
TGA	Therapeutic Goods Administration
VIF	Variance Inflation Factor

Chapter One
INTRODUCTION

1.1 Introduction to the Chapter

This thesis presents a report on an empirical study of consumer purchase behaviour regarding Health Supplement Products (HSPs). A Health Supplement Product is a subgroup of Complementary and Alternative Medicines (CAMs) used as self-treatment for the purpose of maintaining and promoting health. HSPs refer to tangible products, as opposed to CAM services such as acupuncture and iridology. This first chapter of the thesis presents the background to the research, specifies the research problem and describes its significance. The chapter then presents an overview of the research methods used, defines some of the key terms used, and concludes with a brief description of the structure of this thesis.

1.2 Background to the Research

The increasing popularity of Complementary and Alternative Medicine (CAM) in Western societies is a substantial and growing part of health behaviour among consumers. 'Complementary and Alternative Medicine' is defined as a medicine or therapy used either *in conjunction with* or *instead of* mainstream conventional medicine. Some of the examples of Complementary and Alternative Medicine include acupuncture, chiropractic services, herbal remedies and homoeopathic preparations.

The three driving forces for conducting this research were: (1) the increasing usage and expenditure on CAM among consumers; (2) developments and changes in the health-care market in relation to CAM; and (3) knowledge gaps in the research literature on CAM.

Two successive telephone surveys carried out by Eisenberg and his colleagues (1998, 1993) have shown that, between 1990 and 1997, CAM usage in the U.S.A. increased from 34% to 42%. The use of herbal remedies and megavitamins (forms of HSPs) showed the greatest increase (herbal remedies from 2.5% in 1990 to 12% in 1997, megavitamins 2.4% in 1990 to 5.5% in 1997). Thomas et al. (2001), in a survey in the U.K., showed that an estimated 22.1% of respondents had purchased homoeopathic or herbal remedies between 1997 and 1998. More recently, a BBC survey in 1999 revealed that 34% of telephone interview respondents in the U.K. had used herbal medicine at least once within the last year (Ernst and White 2000). MacLennan et al. (1996) showed that more than 60% of Australians had used CAM at least once a year. MacLennan et al. estimated that Australians spend approximately A$621 million on CAM products and A$309 million on CAM therapists per annum (MacLennan et al. 1996). Such population-based descriptive studies, aimed mainly at identifying the prevalence of CAM use in each country, reveal the increasing popularity of CAM among consumers. Thus, this popularity of CAM has been a driving force for the researcher to conduct a study investigating the consumer behaviour associated with the purchase of Health Supplement Products.

The second driving force for conducting this research came from the developments and changes in the health-care market in relation to CAM. Growing interest and usage of

CAM in the U.S.A. and Australia has prompted both governments to establish research centres specifically addressing CAMs and to reform the regulation of CAMs. A relatively high incidence of conventional medicine practitioners' referrals to CAM practitioners or to physicians who practice CAM service was reported in many studies (Easthope et al. 1998, 60% in the U.K., Goldszmidt 1995, 59% in Canada, Visser and Peters 1990, 90% in Holland, Marshall et al. 1990, Hadley 1988, 80% in NZ, Anderson and Anderson 1987, Wharton and Lewith 1986, 60% in the U.S.A.). In response to market demand for CAM, many insurance companies have started covering some forms of CAM within their special benefit schemes. Also traditional pharmaceutical companies have entered into the growing Health Supplement Products market. A more detailed explanation of the developments and changes in the health-care market will be described in Section 2.2.

The third driving force for conducting this research came from knowledge gaps in the previous CAM studies. A review of the relevant literature revealed that the previous CAM studies have methodological limitations. The majority of medical symptoms are self-treated by lay people (Dean 1981) and many forms of CAM are used for non-serious medical conditions, health promotion, or disease prevention and by self-treatment (Eisenberg et al. 1993). A study by MacLennan et al. (1996) has shown that there is a high usage of CAM among healthy people and that chronically ill or disabled people are not amongst the major users of CAM. However, the sample respondents in the previous CAM studies, except for population-based studies, were mainly patients of either conventional or CAM practices. In addition, the population-based CAM studies focus on descriptive demographics and have a limited conceptual basis.

A review of the marketing literature has shown that while researchers have studied various aspects of the consumer behaviour related to the purchase of health-related products and services, few published studies have used the Health Belief Model (HBM) as a theoretical basis. The personality traits of the HBM have not been used to explain and predict the consumer purchase behaviour in relation to Health Supplement Products. The HBM is a *value-expectancy* framework, in which behavioural decisions are made to avoid negatively valued outcomes (i.e. reduction of the threat) and also behaviour is predicted from the value of an outcome to an individual, and from the individual's expectation that a given action will result in that outcome (Becker and Maiman 1975, Kirscht 1974).

While most of the literature to date has been concerned with CAM as a service or as an undifferentiated mix of goods and services, this study focuses specifically on CAM products (i.e. Health Supplement Products). The HBM, one of the most widely used theories in the field of health behaviour, is used as the theoretical framework for the current research in explaining and predicting the determinants of consumer decision-making on the purchase of HSPs. A more detailed discussion on the literature and knowledge gaps regarding CAM and the HBM will be presented in Chapter 2 and 3 respectively.

1.3 Research Problem and Research Questions

The research problem addressed by this study is the issue of why some people purchase Health Supplement Products and others do not. Despite the many studies on CAM generally, little research to date has examined this problem, and few studies have considered consumer behaviour and marketing perspectives. The overall aim of this study was to contribute to the body of knowledge regarding the consumer purchase behaviour in relation to CAM, particularly with regard to Health Supplement Products.

More specifically, the aim of this study was to develop and test a conceptual framework, which enables the consumers' decision-making on the purchase of Health Supplement Products to be explained and predicted in a systematic way.

The research problem is further divided into three research questions. The specific research questions addressed by this thesis are:

1. Are certain personality traits associated with consumers' perceptions of the value of Health Supplement Products?

2. To what extent do the elements of the Health Belief Model explain and predict the likelihood of a consumer purchasing a Health Supplement Product?

3. Do age, gender, and education affect the likelihood of a consumer purchasing a Health Supplement Product?

1.4 Contributions of the Research

This study provides both academic and managerial contributions, and both are discussed in the following sections.

1.4.1 Academic Contributions

The academic contributions are sixfold. First, despite the current increased popularity of and extensive research on CAM, few studies have proposed and empirically tested conceptual models. The existence of inconsistent results in CAM studies may be at least partially attributed to the fact that few studies attempted to use or develop theories to explain consumer behaviour in relation to CAM. The aim of this study is to develop a clear and coherent conceptual model which enables consumer purchase behaviour regarding Health Supplement Products to be explained and predicted in a more comprehensive way.

The second contribution stems from the development of a conceptual model which is capable of explaining and predicting the likelihood of a consumer purchasing an HSP. The first unique characteristic of the conceptual model is that it combines the separate elements in the HBM of perceived benefits and perceived barriers into a single variable, 'perceived value of HSPs'. Secondly, five personality traits (i.e. the antecedents of the 'perceived value of HSPs') and 'external cues to action', which are very specific to consumers' purchase of HSPs, were included in the model for empirical testing.

Third, as some of the measurement instruments were not available prior to this study, two new measurement scales were developed. One of the major reasons for the

inconsistent results in the previous CAM studies is attributed to the absence of universally accepted measurement scales. The two new scales included 'perceived value of HSPs' and 'external cues to action'. These two new scales, both with high internal consistency scores, could be used by researchers or by marketing managers within the HSP industry who need to establish an effective marketing strategy. At a broader level, interested parties could use these instruments to develop measurements in other social sciences.

The fourth contribution emerges from the research focus on Health Supplement Products (i.e. the product type of CAM) rather than the service type. Although the intrinsic differences between products (or goods) and services have always been recognised and stressed in marketing research, many CAM studies have not attempted to separate the product forms of CAM from the service forms of CAM.

The fifth contribution stems from the target population at which the current study was aimed, namely, Australian adults drawn from across the nation. A study by MacLennan et al. (1996) has shown that there is a high usage of CAM among healthy people. However, the samples in the majority of CAM studies, except for a few national surveys (Eisenberg et al. 1998, 1993, MacLennan et al. 1996), were recruited from physician's offices or CAM practitioner's clinics. Such research did not include healthy people, rather, it included patients with specific diseases: e.g. cancer (Begbie et al. 1996) or hypertension (Brown and Segal 1996). Therefore, the application of the study results based on those with specific diseases to the general population was considered to be limited. On the basis of the unique nature of the current study, the findings of the

current study can be considered generalisable to Australian consumers of Health Supplement Products.

Finally, the academic contribution derives from a rigorous two-stage methodology: a preliminary qualitative study followed by a quantitative study in the form of a nationwide sample survey. Given this two-stage design, the current study is the most comprehensive study of the determinants of Health Supplement Products purchase conducted to date.

1.4.2 Managerial Contributions

The managerial contributions are threefold. First, a deeper understanding of potential customers is gained by identifying the individual differences (i.e. personality traits, socio-demographic variables) and by understanding social cognitions of the individual buyer (i.e. consumers' perceptions of the value of HSPs, and consumers' perceptions of general health threats). This understanding can be of importance to marketing managers in building effective segmentation and targeting strategies. It is also relevant to advertising managers for the development of promotional themes and messages which appeal to potential consumers. The findings on the external cues to action can also be of value in devising advertising strategies.

Second, even though recent studies have shown that many conventional medical practitioners are interested in integrating some type of CAM into their practices (Easthope et al. 1998, Easthope 1993), a high proportion of conventional medicine patients had not consulted with their medical doctors about their concurrent use of HSPs and the prescription medicines (Kristoffersen et al. 1997, Sawyer et al. 1994). By

gaining an understanding of consumers' perceptions, and attitudes toward HSPs and their unique characteristics, health-care practitioners may better understand patients' needs and wants and improve the communication with their patients.

Finally, health-care educators and health-care policy-makers could also benefit from the findings of this study. The results could be of use in the planning of education programs or health policies. Although there have been many reports that natural Health Supplement Products are not always safe (Levy 1999b, Palmer 1998, Drew and Myers 1997, Thornton 1996, Pillans 1995), the evidence from this research reveals that consumers in general have a tendency to perceive HSPs as safe. This perceptual difference could enable healthcare educators and policy-makers to reconsider health-care education programs and policies.

1.5 Overview of Methodology

This study utilised two stages of cross-sectional research design, which included 65 in-depth interviews as a preliminary qualitative study and a nation-wide mail survey as the second stage of this study. The reasons for adopting a cross-sectional design were first since the research questions do not focus on consumers' behaviour change over time but on consumers' perceptions and attitudes toward Health Supplement Products (or Complementary and Alternative Medicine in a broader category) at the current time. Secondly, a longitudinal study requires a longer time period inherent in the design and additional costs, neither of which was possible within the constraints of conducting a PhD.

The findings from the in-depth interviews (refer Appendix VII for a summary of results) together with the literature review on CAM were used to develop a conceptual model and to generate research hypotheses. Excerpts of the interviews can be found in the rationale for research hypotheses in Section 4.4. Whilst the qualitative section of this research project was invaluable in developing the conceptual model and research hypotheses, the thesis focuses on the quantitative research.

A nation-wide mail survey targeting adults (aged 18 and above) was conducted to empirically test the conceptual model and the twelve research hypotheses. The mail survey method allowed a large number of geographically dispersed respondents to be contacted cost effectively. The follow up letter was sent in order to increase the response rate and a total of 974 responses were eligible for the statistical analysis. Statistical analyses were performed using *chi-square*, *multiple regression* and *logistic regression* statistics.

1.6 Definition of Health Supplement Products

A new term, Health Supplement Products (HSPs), was coined by the researcher to use in this thesis. A Health Supplement Product, the main focus of this thesis, is defined as the product type of Complementary and Alternative Medicine used as self-treatment for the purpose of health maintenance and promotion.

HSPs include vitamins, minerals, herbal remedies, homoeopathic preparations, and other health related products which may be sold in pharmacies, health product shops, or by homoeopaths, naturopaths, herbalists etc. Vitamins and minerals were included in the definition of HSPs in conformance with the Australian Office of Complementary

Medicines (OCM), which focuses exclusively on complementary healthcare products and which defines 'Complementary Medicines' to include: vitamins, minerals, herbal remedies, naturopathic medicines, homoeopathic preparations, aromatherapy products, and nutritional supplements (Medicines Definitions 2000).

Zollman and Vickers (1999) define Complementary and Alternative Medicines as:

" ... a broad domain of healing resources that encompasses all health systems, modalities and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health systems of a particular society or culture in a given historical period."

A more detailed definition of key terms is presented in Appendix I.

1.7 Structure of the Thesis

The thesis is structured as follows.

Chapter 2 is a review of the relevant literatures. Firstly, developments and changes in health-care markets are explained, and then a review of the literature regarding CAM studies is discussed. This is followed by a review of the literature on the HBM, which forms the theoretical framework of this study.

Chapter 3 summarises the knowledge gaps in the previous CAM and HBM studies. The chapter includes the limitations of previous CAM and HBM research and discusses the inconsistent findings in CAM studies.

Chapter 4 presents the development of a conceptual model and introduces the research hypotheses derived from the literature review and from the findings of the preliminary qualitative study.

Chapter 5 discusses the research methods used in the study. It covers the research design, the data collection methods, and the statistical methods used to analyse the data.

Chapter 6 and **Chapter 7** report the findings from the descriptive analysis of the survey data, the results of the test of the conceptual framework and associated research hypotheses.

Chapter 8 presents the discussion and conclusions. The findings from Chapter 6 and Chapter 7 are summarised and discussed in light of the findings of previous studies.

This chapter continues on to discuss academic and managerial contributions, followed by the limitations of the research. Finally, proposed areas for further study are presented together with conclusions.

1.8 Summary

This opening chapter introduced the thesis by outlining the background to the research and presenting the research problems and significance of the research. This chapter continued by outlining the methodology used in the study. Finally an overview of the structure of the thesis was presented.

From this base, the following chapters of the thesis turn to a discussion of the literature, knowledge gaps, the proposal of a conceptual model and research hypotheses, and a description of the research methods used.

Chapter Two
LITERATURE REVIEW

2.1 Introduction

The previous chapter provided a description of the research question that will be examined in this thesis. Essentially, the aim of this study is to systematically explain and predict consumers' purchase behaviour in relation to Health Supplement Products (HSPs). This will involve examining the literature on purchase behaviour, health behaviour, and Complementary and Alternative Medicine (CAM).

This chapter commences with developments and changes in the health-care market in relation to the popularity of CAM. The chapter continues on to review the key reasons for the use of CAM. Next, the chapter discusses theories of purchase behaviour in marketing and the reasons for applying a health behaviour theory in the current research. The final section of this chapter will provide a review of the Health Belief Model (HBM), which has been used as the basis of the theoretical framework for the current research.

2.2 Developments and Changes in the Health-care Market

The present popularity of CAM in Western societies has resulted in a number of developments and changes in the health-care market. Health stakeholders encompass consumers, government, conventional health professionals, health insurance companies,

and commercial sectors, and at least some sections of each of these groups have shown an increasing interest in CAM.

The developments and changes can be summarised as: (1) increasing usage and expenditures regarding CAM; (2) establishment of government research centres and new regulations on CAM; (3) increasing acceptance of CAM in the conventional medicine sector; (4) increasing health insurance coverage of CAM; and (5) entry into the HSP market by pharmaceutical companies. Each of the developments and changes will be explained in the following sections.

2.2.1 Increasing Usage and Expenditures on CAM

National surveys suggest that CAM is popular throughout the industrialised countries. In the surveys, the utilisation rate of CAM therapies reached 40% in the U.S.A. (Eisenberg et al. 1998), 33% in Finland (Vaskilampi et al. 1993), 15% in Canada (Millar 1997) and 10% in Denmark (Rasmussen and Morgall 1990).

In a 1997 national survey in the U.S.A. (Eisenberg et al. 1998), 40% of Americans reported using some form of CAM, making 629 million visits to CAM practitioners, which represented a 47% increase compared to a survey performed by the same author in 1990 (Eisenberg et al. 1993). Eisenberg et al. (1998) report that associated out-of-pocket expenditures on CAM came close to USS 27 billion, an amount equal to estimated out-of-pocket spending (USS 29.3 billion) for all U.S. physician services. Between the two surveys, a significant increase was reported in the use of herbal medicines (from 2.5% in 1990 to 12.1% in 1997), megavitamins (from 2.4% to 5.5%), massage (from 6.9% to 11.1%), and homoeopathy (from 0.7% to 3.4%). Approximately

one-third of the US$ 27 billion spent was associated with the use of dietary supplements (US$ 3.3 billion for high dose vitamins and US$ 5.1 billion for herbal products). Of the 44% of adults taking prescription medications, approximately one in five reported concurrent use of at least one herbal product or high-dose vitamin. Somewhat lower figures were reported in another study, which showed that the retail sales of vitamins, minerals and herbal supplements in the U.S.A. were estimated to be US$3.77 billion in 1996 and US$ 6.5 billion in 2001 (White 1997).

A more recent study on rheumatology and general medicine outpatients in the U.S.A. has shown that about 30.6% of patients reported using dietary supplements (Mikuls et al. 1999). In relation to homoeopathic remedies, Americans spent US$ 165 million on homoeopathic remedies in 1994 and according to the American Homoeopathic Pharmaceutical Association, retail sales were estimated at US$ 201 million with a yearly growth rate of 20% (Stehlin 1997). Of 150 new cold remedies launched in the United States in 1994, for instance, 34 were homoeopathic compared with 17 of 92 in 1992.

Sales of herbal remedies in the European Union were reported to be US$ 6 billion with an estimated growth rate of 5%, giving sales in 1997 equivalent to US$ 7 billion (Daffy 1997). Of the 1994 sales of US$ 6 billion, Germany had the largest share with US$ 2.5 billion. Of the US$ 2.5 billion sold in Germany, US$ 1.4 billion represented herbal remedies prescribed by a physician, while the remaining US$ 1.1 billion represented self-medication.

Australia also shows a popularity of CAM similar to that in the U.S.A. and other European countries. Kristoffersen et al. (1997) in a study on the prevalence of CAM products among patients presenting to an emergency department of a hospital found that 52% had used alternative medications (e.g. herbal remedies and vitamins/minerals) within the last twelve months. A general population survey in South Australia (MacLennan et al. 1996) has shown that approximately 48% of the respondents used at least one non-medically prescribed CAM and about 20% of the respondents visited at least one alternative practitioner. The estimated costs to the Australian population were AS 621 million for CAM products in 1994 and AS 309 million for CAM therapists per annum. This expenditure on CAM exceeded the AS 360 million of patient contributions for all classes of pharmaceutical drugs purchased in 1992/1993.

Daffy (1997) estimated the total market value of herbal products in Australia to be A$ 200 million (AS 160 million from retailers and AS 40 million from health professionals such as herbalists, naturopaths, pharmacists and doctors).

Other evidence for the popularity of Complementary and Alternative Medicines (CAMs) is that at least 2.8 million Traditional Chinese Medicine (TCM) consultations per year occur in Australia, with an annual turnover of AS 84 million. The importation of Chinese herbal medicines has been increasing at the rate of 100% per year since 1993 (Office of Complementary Medicines: Facts and Figure 1999)

2.2.2 Establishment of Government Research Centres and New Regulations on CAM

Growing interest in and usage of CAM in the U.S.A. and Australia has prompted both governments to establish research centres specifically addressing CAM and to reform the regulation of CAM.

The Office of Alternative Medicine (OAM) was established as a branch of the National Institute of Health (NIH) in the U.S.A. in 1991 to facilitate the scientific evaluation of CAM treatments by providing information on CAM. The NIH's creation of OAM has been instrumental in the growing professional acceptance of CAM therapies and the integration of these therapies into conventional medicine (Nurse's Handbook of Alternative & Complementary Therapies 1999).

Although dietary supplements are no longer subject to Food and Drug Administration (FDA) approval since the passage of Dietary Supplement Health and Education Act (DSHEA) of 1994, product labelling and information about dietary supplements are now regulated by the new Act (White 1997, Brown and Foster 1997). Under the DSHEA of 1994, manufacturers are still bound to list all their ingredients and to meet certain requirements in labelling the products. For example, the act allows product labelling to contain a statement describing how the product's consumption affects structure or function or general well-being in humans, but it does not permit a manufacturer to make a specific health claim for a product. The product label must carry the disclaimer: "This statement has not been evaluated by the FDA. This product is not intended to diagnose, treat, cure, or prevent any disease".

Similar to the establishment of the OAM in NIH in the U.S.A., the increasing popularity of CAM has stimulated the Australian Government to introduce the Complementary Medicines Reform Packages. The purposes of introducing the reform packages were both to support the right of Australians to freely choose natural therapies and to ensure that the choice of health-care remains as wide as possible by reducing unnecessary barriers, while delivery remains as safe as possible. The reform packages not only created the Office of Complementary Medicines (OCM) within the Therapeutic Goods Administration (TGA) and the Complementary Healthcare Consultative Forum (CHCF) in 1999, but also extended the role of the Complementary Medicines Evaluation Committee (CMEC), which had been established in 1997. The CMEC became a statutory expert committee with the passage of the Therapeutic Goods Amendment Act of 1999. The CMEC considers the level and quality of evidence to support health maintenance claims and the level and quality of evidence to support the safety of long-term continuous use. While the OCM focuses exclusively on the regulation of Complementary Healthcare Products, the role of CHCF is to facilitate consultation between government, the complementary healthcare industry and consumers. The extended role of CMEC includes consideration of the level and quality of evidence to support health claims in advertising (Declarations Under Section 7 of the Therapeutic Goods Act 1989).

2.2.3 Increasing Acceptance of CAM in Conventional Medicine Sector

There are significant indications of increasing acceptance of CAM in the Conventional Medicine (CM) sector. These include: (1) relatively high rate of CM practitioners' referrals to CAM providers; (2) growth of CM practitioners incorporating CAM

practices; and (3) increasing number of conventional medical schools and educational institutions which offer various types of CAM courses.

An increasing rate of CM practitioners' referrals to CAM practitioners was shown in a survey of physician's referrals for CAM therapies in the U.S.A. and Israel, where more than 60% of physicians recommended CAM to their patients at least once in the previous year, and 38% had done so in the previous month, revealing an increased interest among physicians (Borkan et al. 1994). A Canadian survey of general practitioners' referral practices has shown that 59% of the respondents reported referring patients to physicians who practice CAM services and 68% to non-medical practitioners (Goldszmidt 1995). The proportion of doctors who refer patients to non-medical therapists ranges from 60% in Britain (Easthope et al. 1998), 60% in the U.S.A. (Anderson and Anderson 1987, Wharton and Lewith 1986), 80% in New Zealand (Hadley 1988, Marshall et al. 1990), to 90 percent in Holland (Visser and Peters 1990).

The second indication of this increasing acceptance of CAM is the growth of conventional practitioners incorporating specific CAM practices into their treatment. For example, 16% of general practitioners in Australia (Sawyer et al. 1994), Britain (Stoll 1993, Coates et al. 1987) and Canada (Kodish and Post 1995), and 30% in New Zealand (Paterson and Peacock 1995, Borkan et al. 1994) provided CAM therapies. Easthope et al. (1999) report that about 15% of general practitioners in Australia claimed Medicare reimbursement at least once for acupuncture in 1996, and this reimbursement represented approximately A$ 18 million. Komesaroff (1998) argues that the significant increase in the use of acupuncture by conventional medical practitioners in Australia was due to the introduction of Medicare rebate for acupuncture

in 1984. More than 2,500 doctors were using acupuncture and approximately 1,000 doctors were practising homoeopathy as part of their regular practices (Australian Consumers' Association 1997a, b, c). A recent study has shown that 1 in 5 Victorian GPs are using CAM in their practice (Pirotta et al. 2000). This shows an increase compared to the findings of a previous study that 1 in 6 Australian GPs employed some form of CAM (Services Division RACGP 1996).

The third indication of this increasing acceptance of CAM is that a number of traditional medical schools and educational institutions offer various types of CAM courses (e.g. acupuncture and herbal medicine). For example, Wetzel et al. (1998) reported that 64% of medical schools in the USA, including Harvard and Stanford, offer elective courses and seminars on CAM, and common subjects of such elective courses include chiropractic, acupuncture, homoeopathy, herbal therapies, and mind-body techniques. Harvard Medical School offers a course on how alternative treatments might affect clinical practice and research, and Stanford University offers its medical students a course that examines CAM (Hassan 1997, Langone 1996).

Australia has also followed this trend of integration of CAM into medical and health science schools. Monash University offers a course titled "Acupuncture for Nurses" of twelve months of duration, and the Department of Community Medicine in Monash University provides options regarding non-orthodox approaches to health-care including natural stress reduction techniques such as meditation, acupuncture and introduction to naturopathy (Duffy 1996, Bennett 1996). Table 2.1 summarises schools offering CAM courses in Australia with the related degrees.

Table 2.1 Schools and Degrees/Courses of CAM

Name of Schools of CAM	Degree /Course
Nature Care College (N.S.W.)	Diploma/75 courses
The Australasian College of Natural Therapies (NSW)	Bachelor, Diploma, Certificate/13 courses
The Royal Melbourne Institute of Technology (VIC)	Bachelor, Master/Chinese Medicine
Victorian University of Technology (VIC)	Bachelor/Acupuncture
Southern Cross University (N.S.W.)	Bachelor/Naturopathy, Master/Holistic Health
Royal College of Nursing, Australia (Canberra)	Certificate/CAM therapies
The Caroline Chisholm School of Nursing (VIC)	Certificate/Acupuncture

At the Southern Cross University, a non-core unit titled "Introduction to Complementary Therapies" is the third most popular unit sought after by distance education nursing students (Duffy 1996). The Royal College of Nursing, Australia offers a certificate course on complementary therapies, which is proving to be very popular with nurses Australia wide (McCabe et al. 1995). Acupuncture is offered at the Victorian University of Technology in a Bachelor in Health Sciences degree (Bennett 1996).

As a result of the increasing acceptance of CAM, a new term, Integrative Medicine, has emerged. For example, an Australian Integrative Medicine Association and Swinburne University Graduate School of Integrative Medicine in Victoria (Hassed 2000) have been established. Benjamin et al. (1998) claim that the primary roles for the integration of CAM techniques and principles into the traditional cancer management are to maximise immune system functioning, improve the quality of life, minimise the adverse effects of chemotherapy in cancer patients, and alleviate helplessness and hopelessness.

2.2.4 Increasing Health Insurance Coverage of CAM

Many health insurance companies are responding to market demand for CAM. It was found that many insurance companies in the U.S.A. had been rebating various types of CAM such as biofeedback, physiotherapy, acupuncture, preventive medicine, chiropractic, osteopathy, and physical therapy in response to consumers' demand for CAM (Pelletier et al. 1999). Furthermore, in the State of Washington in the U.S.A., by law, every health insurer must cover a great number of CAM practitioners including acupuncturists and naturopaths (Crabtree 1996). Although the range of treatments covered by insurance companies varies, its coverage is broad. For example, while some cover yoga, meditation and diet program for reversing coronary heart disease, others cover acupuncture, biofeedback and massage, if prescribed by a physician (Langone 1996). Medibank Private, an Australian health insurance company, recently started covering Chiropractic and Osteopathy, Acupuncture, and Naturopathy within their special benefit schemes (Medibank Private: Premier Plus Packages 2002).

2.2.5 Entry into the HSP Market by Pharmaceutical Manufacturers

In accordance with this popularity, several traditional pharmaceutical companies have entered into the growing Health Supplement Product market.

The fact that the market size of HSPs has been a relatively small compared to that of conventional pharmaceuticals and that plants or the combination of plants cannot be protected by patent has been an entry barrier for pharmaceutical companies to build a new business model from the HSPs market. However, the growing market size of HSPs has been sufficient for some pharmaceutical companies to start investigating the HSPs market. As a result, such major pharmaceutical companies as Bayer, American Home

Products, Warner-Lambert, and Novogen launched their own lines of herbal products (Levy 1999a). Johnson & Johnson also entered the Health Supplement Products market in the U.S.A. by acquiring sole marketing rights of a CAM cholesterol reducer (i.e. Benecol™) derived from wood-pulp (Pollack 1998). McNeil Consumer Products in Canada began selling a migraine prophylaxia made from the plant Feverfew (Cottrell 1996). Faulding, an Australian pharmaceutical company, acquired several natural health food companies before entering the HSP market in 1999.

In summary, given the increasing popularity of CAM in Western societies and the changing trends in health-care markets, an investigation of CAM-related consumer behaviour will have managerial implications for a number of interested parties.

2.3 Studies on Complementary and Alternative Medicine

This section reviews the literature regarding the explanation patients give for their choice of CAM over Conventional Medicine. The major reasons cited for CAM use were: (1) dissatisfaction with and limitations of Conventional Medicine treatment; (2) perceptions of positive aspects of CAM; (3) personality traits; (4) health conditions involved in the use of CAM; and (5) external cues. A brief summary of the empirical studies of CAM that have addressed the question of why people use CAM is provided in Table 2.2. This table summarises the research methods used, the subjects used in the research, the study aims, concepts measured, and the reasons and factors identified for CAM use (i.e. overall results of the studies in the table).

Table 2.2 Empirical Studies of Complementary and Alternative Medicine

No	Author(s) (Year, Country)	Methods (No. of Sample)	Subjects	Study Aims	Concepts Measured	Reasons & Factors Identified
1	Owens et al. (1999, USA)	Questionnaire survey (n = 186)	Pts* at Cancer, Pain Mgmt* & Community Centres	Is the use of CAM* associated with psychological factors?	(1) level of CAM use; (2) effectiveness ratings of CAM; (3) positive affect; (4) negative affect; and (5) Absorption Scale	Higher Absorption
2	Wagner et al. (1999, USA)	Open-ended interviews (n = 22)	Current users of SJW*	To examine the reasons people choose to self-medicate with SJW*	Results: Themes appeared in the study: (1) personal health-care values; (2) depressed mood; (3) perceptions of seriousness of disease; and (4) accessibility issues	(1) Dissatisfaction with CM, (2) Need for personal control, (3) Philosophical acceptance of natural health and illness
3	Siahpush (1999, Aus*)	Telephone interviews (n = 787)	Adults residents in VIC* State	Why do people favour CAM?	(1) dissatisfaction with the medical outcome and encounter; (2) natural remedies; (3) anti-sentiment; (4) holism; (5) rejection of authority; (6) individual responsibility; and (7) consumerism	Postmodern philosophy
4	Astin (1998, USA)	Mail survey (n = 1035)	National samples	Why patients use CAM?	(1) satisfaction with CM; (2) need for control; (3) philosophical/value congruence; (4) holistic philosophy; (5) belief in the efficacy of CM; (6) perceive benefits of CAM; (7) health factors; and (8) demographic factors	(1) A holistic orientation to health, (2) Poorer health status
5	Breuner et al. (1998, the USA)	Questionnaire Survey (n = 153)	Homeless Youth aged 14-21	To evaluate the use of CAM by homeless youth	(1) health issues; (2) use frequency of different therapists or therapies; (3) referral sources; and (4) perceived effectiveness of treatment	(1) Friend's use and recommendation of CAM, (2) Perceived efficacy on CAM, (3) Negative experience with physicians, (4) Low cost
6	Berg & Arnetz (1998, Sweden)	Questionnaire (n = 118)	Pts of Dermatology	Characteristics of CAM users	(1) demographic data; (2) medical history; (3) experience with CAM; (4) health beliefs; (5) life style; and (6) locus of control	(1) Wanted to try everything, (2) Personal faith in remedy, (3) Health conscious
7	Fernandez (1998, Canada)	Population-based survey (n = 866)	Paediatric cancer Pts	Prevalence and factors that influence the use and non-use of CAM	Factors influenced the use of CAM (42% used CAM): (1) prior use; (2) prior positive attitude; (3) soliciting information from family and friends; (4) high risk of death at diagnosis; and (5) advanced education of the father	Influence from family members and friends

Table 2.2 Empirical Studies of Complementary and Alternative Medicine (Continued)

No	Author(s) (Year, Country)	Methods (No. of Sample)	Subjects	Study Aims	Concepts Measured	Reasons & Factors Identified
8	Siahpush (1998, Aus)	Telephone interviews (n = 209)	Adults in VIC State	Why people turn to CAM?	(1) dissatisfaction with health outcome of CM; (2) the emergence of post-modern values; and (3) popularity of CAM	(1) Postmodern value, (2) Dissatisfaction with health encounter with CM
9	Kelner and Wellman (1997, Canada)	Personal interviews (n = 300)	Pts of GP, Chir**, Ac** & TCM**, Nat**, Reiki	The motivations of Pts who choose to seek care from 5 different types of practitioners	(1) predisposing factors; (2) enabling factors; (3) personal enabling factors; (4) choosing a therapy; (5) location; (6) ability to pay; (7) the need for care; (8) length of time with problem; (9) effect on daily life; and (10) chronicity of health problems	(1) Holistic principles, (2) Self-responsibility, (3) Suggested by others
10	Elder et al. (1997, USA)	Questionnaire survey (n = 113), Focus group interview (n = 1)	Pts from 4 Family practices	Main reasons for using CAM	(1) type of CAM used; (2) for what problem they used it and why; and (3) whether or not they also saw their family physician for this problem. Focus group participants were asked to expand on their answers to the above questions by giving examples and stories about their experience.	(1) A belief that it would work, (2) To prevent illnesses or injuries, (3) For wellness, (4) For a specific problem
11	Lupton (1997, Aus)	In-depth Interviews (n = 60)	General public in Sydney	Identify and describe some social trends	(1) changing role and status of doctors; (2) biomedicine vs alternative medicine; and (3) differences among participants: the influence of age and social class	(1) Failure of CM to treat illness, (2) Emphatic interaction offered by CAM, (3) Value on the importance of affective aspects of healthcare
12	Kristoffersen et al. (1997, Aus)	Questionnaire interviews (n = 325)	Pts in Emergency Dept.	Use of CAM in Sydney	(1) patterns of usage; (2) products used; (3) sources of supply; and (4) attitudes and beliefs	(1) Feel better, (2) Clean-up the system, (3) Premenstrual stress/tension or rheumatoid arthritis, (4) Prevent diseases such as common cold, (5) Herbal medicines are safer
13	Furnham & Kirkcaldy (1996, Germany)	Questionnaire survey (n = 202)	Pts of GP, remedial therapists, Hom**, others.	Different attitudes towards health and illness	(1) general beliefs about illness; (2) health consciousness and awareness; (3) the relationship between 22 ailments and role of mind-body in the origins of illnesses; (4) health locus of control; (5) a list of 10 illnesses experienced; and (6) treatment questions on CAM therapists and their competencies as control over one's health	A deep seated belief in the effectiveness of CAM

Table 2.2 Empirical Studies of Complementary and Alternative Medicine (Continued)

No	Author(s) (Year, Country)	Methods (No. of Sample)	Subjects	Study Aims	Concepts Measured	Reasons & Factors Identified
14	Vincent & Furnham (1996, UK)	Questionnaire survey (n = 268)	Pts from Ac, Ost**, and Hom	Why chose particular practitioners?	(1) history of present complaints; and (2) reasons for seeking CAM	(1) Positive valuation of CAM (more natural, effective, relaxing, feeling of active involvement in it), (2) Ineffectiveness of CM, (3) Concern about the adverse effect of CM, (4) Concern about poor communication between CM practitioners and Pts
15	McGregor and Peay (1996, Aus)	Telephone survey (n = 166)	TFH** & Community sample	The choice of CAM for health-care	(1) satisfaction with recent medical treatment; (2) satisfaction with recent CAM treatment; (3) history of a chronic complaint; (4) health locus of control; (5) confidence in conventional medicine; (6) differential treatment preferences; and (7) unconventionality	(1) Unconventionality, (2) General lack of confidence in CM treatment
16	Begbie et al. (1996, Aus)	Questionnaire survey (n = 507)	Cancer Pts	Patterns of CAM use by cancer patients	(1) expectations of and satisfaction with both CM and CAM; (2) use of CAM; and (3) Pts characteristics	(1) New source of hope, (2) preference for natural therapy, (3) non-toxic therapy, (4) Supportive CAM practitioners, (5) Try something different, (5) Greater personal involvement
17	Furnham et al. (1995, UK)	Questionnaire survey (n = 256)	Pts from a GP, Ost, Hom, Ac practitioners	The beliefs and behaviours of CAM & GP Pts	(1) medical history; (2) familiarisation with CAM therapies; (3) health beliefs & life styles; (4) health locus of control; (5) scientific health beliefs; and (6) perceptions on the consultation with their GP & CAM practitioners	Conventional Medicine Pts differ in their views on (1) Satisfaction with GP, (2) Healthy life style, (3) Global environment issues, (4) Confidence in Rx* drugs, (5) Faith in medical science, (6) Importance of a 'healthy' mind, (7) Scientific methodology
18	Furnham and Beard (1995, UK)	Questionnaire surveys (187)	Pts at General Hospital, Ac & Sh** clinics	Beliefs and coping style preferences in Pts of CAM and CM	(1) health beliefs (subjects perception of their current state of health, subjects perception of their ability to achieve better health in the future); (2) Just World Beliefs; (3) Miller behavioural style scale (coping strategies); and (4) health opinion survey	Higher in the beliefs about future health than CM group

Table 2.2 Empirical Studies of Complementary and Alternative Medicine (Continued)

No	Author(s) (Year, Country)	Methods (No. of Sample)	Subjects	Study Aims	Concepts Measured	Reasons & Factors Identified
19	Vincent et al. (1995, UK)	Questionnaire surveys (n = 216)	Pts of CM, Ost**, Ac,** Hom** practitioners	Perceived efficacy of CAM and CM	(1) locus of control; (2) importance of science base; (3) importance of psychological factors; (4) possible side-effects of CM; and (5) perceived efficacy of CAM and CM in 16 illnesses	(1) believed less scientific basis of CM and more in its harmful effects (Ac pts), (2) tended in the efficacy of the therapy (Ac pts)
20	Furnham & Forey (1994, UK)	Questionnaire survey (n = 160)	Pts of GP & CAM	Attitudes, behaviours, and beliefs differences between CAM and CM Pts	(1) general beliefs; (2) health consciousness and awareness; (3) illnesses which would consult a GP or a CAM practitioners first; (4) health satisfaction; (5) health locus of control; (6) current illness; (7) human anatomical knowledge; (8) CAM therapists and their perceived competence; and (9) beliefs on the role of the mind and the body of the origins of each illness	Motivational force: a wider belief systems and a consequence of the CAM practitioners and patient encounter. CAM group were (1) more critical and sceptical about efficacy of modern medicine, (2) believed that their health could be improved, (3) had tried more alternative therapies, (4) had holistic orientation, (5) believed that they had a degree of control
21	Sutherland & Verhoef (1994, Canada)	Questionnaire survey (n = 341)	Pts at Gastroenterology clinic	Why do patients seek a second opinion or CAM?	(1) health locus of control; (2) scepticism toward medicine; (3) satisfaction with health-care; and (4) perceived health-care	CAM use was (1) related to scepticism toward CM, (2) negatively related to perceived health status
22	Sawyer et al. (1994, Aus)	Questionnaire survey (n = 48)	Parents of children with cancer	The use of CAM* by children with cancer	(1) any dietary supplements or CAM therapies used by children with cancer; and (2) whether or not the children's doctors had been told the children were using the therapies	The purpose of CAM use was mainly to relieve the pain and stress rather than to cure the disease
23	Murray & Shepherd (1993, UK)	Questionnaire (n = 372), In-depth interviews (n = 20)	Pts listed in a GP	Exploratory study in General Practice	(1) prevalence of use of CAM (PT***, Nat & Herb***, Talk***, Self***); and (2) reasons for use and perceived efficacy	(1) CAM used for minor ailments, first aid purposes, and as prophylaxis for recurrent problems, (2) Belief on the harmful effect of CM

Table 2.2 Empirical Studies of Complementary and Alternative Medicine (Continued)

No	Author(s) (Year, Country)	Methods (No. of Sample)	Subjects	Study Aims	Concepts Measured	Reasons & Factors Identified
24	Furnham & Bhagrath (1993, UK)	Questionnaire survey (n = 160)	Pts from GP & Hom	Beliefs & expectations of Pts from visiting a GP and a Hom	(1) health consciousness; (2) perceived health risks, Illness prevention; (3) general health beliefs; (4) treatment preference; (5) medical history; (6) mental health; and (7) health locus of control	Hom pts were (1) far more dissatisfied with orthodox medicine, and (2) believed in potential self-control over health
25	Lloyd et al. (1993, Aus)	Questionnaire surveys (n = 306)	Pts of (Nat, Chir, Ost, HM, Hom, others.)**	Motives for choosing CAM	(1) socio-demographic data; (2) why people consult alternative therapists; and (3) satisfaction with alternative therapists	CAM users (1) were critical about the efficacy of CM and the manner of CM doctors, (2) had chronic conditions for which CM had failed, (3) were generally wary about conventional drugs, (4) valued holistic approach of CAM
26	Yates et al. (1993, Aus)	Questionnaire surveys (n = 152) In-depth interviews (n = 9)	Cancer Pts	Beliefs and practices by cancer Pts using CAM	(1) use of CM and CAM cancer treatments; (2) beliefs about cancer; (3) need for control over treatment decisions; (4) will to live; (5) encouragement to use CAM cancer therapies; (6) social background factors; and (7) users of CAM therapies	CAM users (1) had higher 'will to live' score, (2) had a greater desire for control over treatment decisions, (3) were more often subscribed to beliefs about alternative causes of cancer, (4) had encouragement to use CAM cancer therapies, (5) believed more the efficacy of CAM therapies
27	Furnham & Smith (1988, UK)	Questionnaire survey (n = 87)	Pts of Hom & GP	Beliefs of Pts in a GP and Homoeopath	(1) perceived susceptibility to illness; (2) health locus of control; (2) mental health; (3) preventive measures and personal resistance to disease; and (4) perceived efficacy of CAM and CM	Hom** group (1) were more sceptical about the efficacy of CM, (2) believed their general health could be improved, (3) tended to have a higher psychiatric morbidity, (4) chose CAM because of the disenchantment with, and bad experiences of CM practitioners
28	Donnelly et al. (1985, Aus)	Questionnaire survey (n = 238)	Pts of Asthma & non-Asthma	Are Pts who use CAM dissatisfied with CM?	The knowledge and attitudes of parents concerning asthma and its treatment (descriptive study)	Pts who use CAM are not those who are disgruntled with orthodox medicine.

Table 2.2 Empirical Studies of Complementary and Alternative Medicine (Continued)

No	Author(s) (Year, Country)	Methods (No. of Sample)	Subjects	Study Aims	Concepts Measured	Reasons & Factors Identified
29	Moore et al. (1985, UK)	Questionnaire surveys (n = 65)	Pts in the centre of CAM	Why do people seek treatment by CAM?	(1) reasons for choosing CAM; (2) sources of information; and (3) expectations of treatment	(1) Failure of CM, (2) Belief on the effectiveness of CAM
30	Avina & Schneiderman (1978, USA)	Open-ended questionnaire survey (n = 100)	Pts of Hom	Reasons for seeking Hom care	(1) reasons for seeking Hom; (2) what the nature of problem was; (3) past experiences with illnesses; (4) goals sought; (5) importance of the principles of Hom; (6) what medical problems would lead them to recommend Hom or CM; and (7) other forms of health-care they were getting	(1) Negative experiences with CM, (2) Congruence with personal principles and beliefs
31	Parker & Tupling (1977, Aus)	Questionnaire survey (n = 559)	Pts of GP, Chir, Nat, and Ac	Pts' evaluation of GPs and CAM	(1) Pts' evaluation of GPs and CAM therapies; and (2) health consciousness and hypochondriasis of the surveyed population.	Dissatisfaction with CM

*CAM = Alternative Medicine CM = Conventional Medicine GP(s) = General Practitioner(s) Mgmt = Management Pts = Patients Rx = Prescription
Aus = Australia VIC = Victoria

**Ac = Acupuncture Arom = Aromatherapy Chir = Chiropractic HM = Herbal Medicine Hom = Homoeopathy
Nat = Naturopathy Ost = Osteopathy Sh = Shiatsu TCM = Chinese Herbal Medicine TFH = Touch For Health
SJW = Saint John's Wort

***PT = Physical Treatment (Osteopathy, Massage, Acupuncture, Reflexology, Alexander technique)
Nat & Herb = Natural and herbal remedies (Homoeopathy, Herbalism, Aromatherapy)
Talk = Talking treatments (Counselling, Psychotherapy, Psychoanalysis, Hypnosis, Faith healing, Fortune telling)
Self = Self Improvement (Meditation, Yoga, Bioenergetics, Autogentic training)

2.3.1 Dissatisfaction with and Limitations of Conventional Medicine

McGregor and Peay (1996) used 'satisfaction with Conventional Medicine' and 'confidence in Conventional Medicine treatment' as independent variables in a study on the choice of Touch for Health (TFH)[2]. 'Satisfaction with Conventional Medicine' did not show a significant difference between TFH group and community group, but 'general lack of confidence in Conventional Medicine treatment' did show significant differences in between two groups.

As early as 1977, Parker and Turpling (1977), in a study on patients' evaluation of natural therapies and GPs, found that the use of CAM was related to the negative aspects of Conventional Medicine. Avina and Schneiderman (1978) studied the reasons patients sought homoeopathic care (n = 100) and found that 81% reported that they had had negative experiences with and perceptions of Conventional Medicine.

More recently, questionnaire surveys on patients from GPs and CAM practitioners have shown that CAM use was positively related to scepticism toward Conventional Medicine (Sutherland and Verhoef 1994, Furnham and Forey 1994). The scepticism toward Conventional Medicine appears among the users of both the product and the service type of CAM. A study examining the reasons people self-medicate with Saint John's Wort[3] has shown that Saint John's Wort use could be predicted from dissatisfaction with Conventional Medicine (Wagner et al. 1999). Patients visiting CAM therapists were wary about conventional drugs (Lloyd et al. 1993). Also patients of a GP believed that Conventional Medicine involve greater risk of harm (Murray and Shepherd 1993).

[2] A form of Therapeutic Touch in Complementary and Alternative Medicine
[3] Saint John's Wort (or 'hypericum') is a herb which is used for depression.

An additional category of factors leading to the disenchantment with Conventional Medicine centres on the manner in which Conventional Medicine is delivered. Examples include a lack of communication between physicians and patients (Yankauer 1997, Menges 1994, Sutherland and Verhoef 1994), a growing loss of faith among consumers of conventional health services due to an invasive (Chung 1996) or purely scientific approach (Berliner and Salmon 1980, Avina and Schneiderman 1978). Also cited are 'dehumanisation' and 'depersonalisation' characteristics of conventional therapy (Risberg et al. 1998, Rosch and Kearney 1985, Taylor 1984), and the failure of Conventional Medicine practitioners to meet the information and emotional needs of patients (Fallowfield et al. 1994, Sutherland et al. 1989, Maguire and Faulkner 1988).

The limitation of Conventional Medicine was another reason for CAM usage. The failure of Conventional Medicine was most frequently cited (45% of the sample) as the reason for choosing CAM among the patients in the Research Centre of CAM in the U.K. (Finnigan 1991, Moore et al. 1985). Ernst (1993) argues that disappointment with Conventional Medicine treatment is largely due to a high expectation of cure by Conventional Medicine. An in-depth interview study (n = 60) among general public in Sydney (Lupton 1997) has shown that despite general faith in conventional medical science, several of the participants sought CAM for illnesses or conditions which had not been sufficiently treated by Conventional Medicine. Many diseases are still incurable by conventional medicine (Yankauer 1997, Schwartz 1997). For example, people facing death can be attracted with promises of cures or improved quality of life that Conventional Medicine cannot make. Therefore, those who cannot be cured by conventional medicine naturally seek other remedies (Gordon 1996). A large proportion of consumers of CAM consists of patients suffering from chronic pain, allergies,

musculoskeletal, stress-related and functional conditions who appear to be disappointed with the treatment they receive from conventional medicine (Thomas et al. 1991, Amor and Todd 1989, Fulder 1988, Moore et al. 1985).

On the other hand, in two successive telephone surveys, Siahpush (1998, 1999) found that neither dissatisfaction with the medical outcome nor dissatisfaction with the medical encounter in Conventional Medicine were significant predictors of attitudes towards Complementary and Alternative Medicine. However, when compared with the dissatisfaction with medical outcomes, the dissatisfaction with the medical encounter remained significant. Astin (1998) in a national population-based mail survey aiming to predict why patients use CAM, where he used 'satisfaction with Conventional Medicine' and 'belief in the efficacy of Conventional Medicine' as predictor variables, concluded that dissatisfaction with Conventional Medicine did not predict use of Complementary and Alternative Medicine. Other studies have also shown that 'dissatisfaction with Conventional Medicine' was not significantly related to the use of Complementary and Alternative Medicine among dermatology patients in Sweden (Berg and Arnetz 1998), families of children with asthma and non-asthma (Donnelly et al. 1985), patients of a GP and various types of CAM practitioners in Germany (Furnham and Kirkcaldy 1996) and in the U.K. (Furnham and Beard 1995).

2.3.2 Positive Aspects of Complementary and Alternative Medicine

In contrast to the dissatisfaction with Conventional Medicine, the positive aspects of CAM have also been cited as a main reason for using them in many studies, and are related to perceptions of effectiveness and safety of Complementary and Alternative Medicine.

In a questionnaire survey among patients at a centre for Complementary and Alternative Medicine therapies (Moore et al. 1985), two-thirds of the respondents cited that a major reason for using CAM was a belief that CAM would work. Similarly, Furnham and Kirkcaldy's (1996) study has shown that those who use CAM may do so less from disenchantment with, and bad experience of Conventional Medicine but rather from a strong belief in the effectiveness of CAM. In a recent survey followed by a focus group interview, Elder et al. (1997) found that patients of a family practice expressed the effectiveness of CAM as the reason why they use them.

A study of CAM use among homeless youth (Breuner et al. 1998) has shown that 87% of the users reported they had been helped "some" or "a lot", and that 44% mentioned "because CAM was natural" as the most common reason for using CAM. Kristoffersen et al. (1997), in a questionnaire survey on the prevalence of CAM therapies, found that 42% of the patients presenting in an emergency department of a hospital perceived herbal medicines as safer than conventional pharmaceuticals.

Wagner et al. (1999) found that positive perceptions on Saint John's Wort (SJW) together with negative perceptions of prescribed antidepressants were shown to increase the likelihood of SJW use. In addition, Keegan (1998) claims that CAM therapies are non-invasive, they offer a holistic approach, and moreover, in many instances, these therapies are less expensive than visiting a physician.

Additional reasons given for usage of CAM include greater interest and belief in the connection between mind and body (Astin 1998, Goleman and Gurin 1993) and cultural transformations of industrialised countries (Anyinam 1990).

2.3.3 Personality Traits

The literature of CAM usage has also investigated personality traits including holistic orientation, internal health locus of control, openness to experience, and scientific health beliefs.

Holistic Orientation

'Holistic orientation' relates to the degree of a consumer's congruence with holistic views or principles. Holistic principles have two distinctive characteristics in their approach to illness treatment and the definition of 'being healthy'. One distinct characteristic of the holistic principles is that it emphasises the importance of the connection of body, mind, and spirit (Goode 1996). As they are not separable, therefore, treatments of illnesses should focus on three elements together as a whole (Goldstein et al. 1988). Furthermore, health is more than just maintaining physical health; emotional and spiritual aspects of health also should be considered as important factors determining physical health. Another distinct characteristic of holistic principles is that they also recognise the body's own power of natural healing (Apostolides 1996, Otto and Knight 1979). It is concluded that human are by nature healthy and the major causes of illnesses come from the imbalance in a person's lifestyle. Under this principle, treatments of illnesses should therefore focus on balancing life styles and strengthening the body's natural healing ability.

The literature provides frequent examples where the holistic philosophy has been emphasised among consumers of various types of CAM. For example, holding an holistic health philosophy was a significant predictor of using CAM (Owens et al. 1999, Astin 1998). In qualitative studies (Kelner and Wellman 1997, Murray and Shepherd

1993), a number of patients of CAM practitioners reported that they had chosen an alternative therapy because they believed in its holistic principles. Lloyd et al. (1993) showed that patients visiting CAM therapists valued the holistic approach of the alternative therapists. Similarly, Vincent and Furnham (1996), from factor analysis of the twenty reasons for using CAM, demonstrated that the perceived value of a holistic approach was one of the most strongly supported reasons for CAM usage. Astin (1998) argues that users of CAM tended not to be dissatisfied with CM but rather they found CAM to be more congruent with their own health beliefs and philosophical orientation toward health and life such as holistic philosophy. The congruency with holistic views among patients of CAM practices also appears in a study involving the product form of CAM. Wagner et al. (1999), in a telephone survey on 22 users of Saint John's Wort (SJW), conclude that SJW use could be predicted from a philosophical acceptance of natural health.

Internal Health Locus of Control

The 'locus of control', based on Rotter's (1966, 1954) social learning theory[4], is a generalised expectancy that occurs when individuals consider that outcomes are dependent or non-dependent on their behaviours. 'Health locus of control', which is an extension of locus of control, posits that individuals with "internal" rather than "external" expectancies are more likely to take action to improve their health habits (Lau and Ware 1981, Wallston et al. 1978). The concept of 'health locus of control' posits that a high score on the 'internal health locus of control' indicates a person feels in control of his or her own health (e.g. "I am directly responsible for my health"),

[4] Rotter postulates that the internal-external (I-E) control of reinforcements is an expectancy variable, and that behaviour occurs as a function of expectancy and reinforcement within a specific situation.

whereas a low score indicates a person feels health is due to by chance and beyond his or her own control (e.g. "People who never get sick are just plain lucky").

A number of studies have examined the relationship between health locus of control and health behaviour and most of these studies have focused on the internal dimension, with several reporting a positive correlation between internal health locus of control beliefs and the performance of health-promoting behaviours (Waller and Bates 1992, Weiss and Larsen 1990, Duffy 1988, Rauckhorst 1987).

The 'health locus of control' has also frequently been investigated as an independent variable to explain the individual differences between users and non-users of CAM. Furnham and Bhagrath (1993), in a questionnaire survey on patients visiting a general practice and a homoeopath in the U.K., have shown that there were significant differences in internal health locus control between the two groups of patients. McGregor and Peay (1996) in a telephone survey in Australia showed that self-control (i.e. internal) and provider control (i.e. powerful others) were significantly different between clients of Touch for Health and a community sample.

In addition, even though some researchers have not empirically tested the 'health locus of control' as an independent variable of their CAM studies, consumers of CAM have frequently mentioned themes suggesting 'internal health locus of control'. Such themes included an 'empowering', 'need for personal control' (Wagner et al. 1999, Astin 1998, Yates et al. 1993), 'self-responsibility' (Kelner and Wellman 1997), and 'active role' (Vincent and Furnham 1996, Begbie et al. 1996).

On the other hand, some studies have shown that the internal health locus of control was not significantly related to alternative medicine use. Sutherland and Verhoef (1994) in a questionnaire survey on the patients of a Conventional Medicine clinic in Canada showed that internal health locus of control was not significantly related to CAM use but there was a trend that CAM users were less likely to be powerful others than were non-users. A series of research studies by Furnham and his colleagues (Furnham and Kirkcaldy 1996, Furnham and Forey 1994, Furnham and Smith 1988) have found that the external health locus of control was significantly different between CAM and GP patients but chance and internal health locus of control were not.

Openness to Experience

The 'openness to experience' concept has been treated as a personality trait (Rosenbaum 2000, McCrae and Costa 1991). 'Open' individuals are curious, imaginative, and willing to entertain novel ideas and unconventional values, whereas 'closed' individuals (those who are low in the openness to experience scale) tend to be conventional in their beliefs and attitudes (Costa and Widiger 1994, McCrae and Costa 1983). McCrae and Costa (1993-94) maintain, "*Openness to experience is a basic dimension of personality and the most relevant to the study of imagination, cognition, and personality*" among all of the five personality dimensions[5]. Similarly, Rogers (1980) sees that persons who are open to experience have the ability to intensely experience the full range of sensory, emotional, and cognitive experiences within themselves, without feeling threatened, and to be aware of their deepest thoughts and feelings.

[5] The other dimensions include neuroticism, extraversion, agreeableness and conscientiousness.

Openness has also been treated as a basic personality trait in Tellegen's (1985) model of personality traits, albeit under the label of 'absorption'. 'Absorption' was defined as openness to absorbing and self-altering experiences. An interest in experience per se, rather than external rewards, is considered to be a key characteristic of the high 'absorption' scorer (Tellegen and Atkinson 1974). Roche and McConkey (1990) maintain that Tellegen's 'absorption' is a characteristic of individuals who are open to emotional and cognitive experience across a variety of situations. Similarly, Glisky et al. (1991) described people who show high absorption as placing high value on art and aesthetic experience in daily life, openness, and unconventional values.

'Cultural creatives' and 'flexible self' are similar terms to the 'openness to experience' and 'absorption' terms. The 'cultural creative' is defined as an emerging cultural group and is part of a socio-demographic typology developed by Ray (1998). 'Cultural creatives' are individuals who are open to new experience, who think holistically, and who place high values on art and aesthetic experience (Owens et al. 1999). Ray[6] (1998) characterises 'cultural creatives' as consumers of new experiences rather than consumers of goods, whether these are obtained at weekend workshops, or on spiritual vacations. McGuire (1988) speaks of the 'flexible self', one that is able to draw upon a variety of resources in the search for better health and personal growth.

Another similar term, which has been used in consumer behaviour, is 'innovativeness'. Fisher (1978) and Wallendorf and Zinkhan (1980) argue that it is clear that some individuals are generally more innovative (e.g. open to new products, experience, and

[6] Ray termed three value subcultures in the US population as the 'cultural creatives' (44 million adults), the 'moderns' (or modernism), and the 'heartlanders' (traditionalism). While the 'moderns' (88 million) are who represent mainstream popular culture and values, the 'heartlanders' (56 million) are a subculture characterised by fundamentalist and traditional values and beliefs.

ideas) than are others. While 'innovativeness' is defined as the propensity to adopt new products and services (Sheth et al. 1991), consumer innovativeness is referred to as the degree to which an individual is relatively earlier in adopting an innovation than other members of a social system (Rogers and Shoemaker 1971). Similarly, Midgley and Dowling (1978) define innovativeness as the degree to which an individual is receptive to new ideas and makes decisions independently of the communicated experience of others.

Owens et al. (1999) in an individual differences study found that 'absorption' was a strong predictor of high CAM use. 'Absorption' was defined as openness to absorbing and self-altering experiences (Tellegen and Atkinson 1974). In a telephone survey among Saint John's Wort (SJW) users in the U.S.A. (Wagner et al. 1999), those who had used SJW expressed a willingness to experiment and try new things. The willingness to try new things is also a characteristic of openness to experience (McCrae and Costa 1983). Berg and Arnetz (1998) in a study among dermatological patients who were using CAM showed that one of the most common reasons for CAM use was that they 'wanted to try everything'. In McGregor and Peay's (1996) study, 'unconventionality' was found to be one of most distinguishable variables in the user group of Touch for Health, a type of CAM, even though the conceptual definition of this term was not clearly described. However, Astin (1998) found that, contrary to his hypothesis, being a 'cultural creative' was not a significant predictor of primary reliance on CAM.

Scientific Health Orientation

'Scientific health orientation' relates to a perception that science is important and that its impact on health-care is important to health-care improvement (Gould and Plank 1987). Thus, people with a high 'scientific health orientation' would not only be more scientific in viewpoint, but would also use scientific reports to make health-related decisions, believing that science is important to helping them make those decisions (Plank and Gould 1990).

Furnham et al. (1995) tested scientific health beliefs among the patients of a GP and three different types of Complementary and Alternative Medicine practices (Osteopathy, Homoeopathy, and Acupuncture). The GP patients showed most faith in medical science, placed least importance on state of mind, were least concerned with the harmful effects of medical science, and showed most support for the use of scientific methodology. In contrast, the acupuncture group expressed significantly less faith in medical science than any of the other three groups; it placed most importance on a healthy state of mind; it was concerned about the harmful effects of medical science; and it showed least support for scientific methodology. Similar to the study design by Furnham et al. (n = 256), a study by Vincent et al. (1995) (n = 216) has shown that an acupuncture group attached significantly less importance to science than the general practice group. However, the osteopathy and homoeopathy groups did not show any significant differences compared to the general practice group.

2.3.4 Health Conditions Involved in the Use of CAM

Lloyd et al. (1993) showed that the patients visiting CAM therapists had chronic conditions for which Conventional Medicine had failed. In a survey among patients visiting a general practice, Murray and Shepherd (1993) also found that osteopathy, acupuncture and chiropractic were, in addition to conventional medicine therapies, used to treat injuries and chronic pain, and that the major purpose of using CAM treatments appears to be for minor ailments, first-aid, or prophylaxis for recurrent problems such as colds, headaches, and throat infections. In a survey on parents of children with cancer, Sawyer et al. (1994) found that Health Supplement Products have been used by children with cancer, but the purpose of that use was mainly to relieve the pain and stress rather than to cure the disease. Similarly, Kristoffersen et al (1997), in interviews with 325 people visiting the emergency department of a general hospital, found that the purpose of CAM use was mainly for the prevention or alleviation of minor illnesses, rather than for the cure of major disease. The purposes included "feel better", "clean-up the system", and "reduce stress or tension".

2.3.5 External Cues to Action

A review of the literature on CAM studies has shown that external cues such as word-of-mouth acted as an influencing factor for CAM use. For example, in a study on parents of 588 children with cancer in Canada (Fernandez 1998), 'soliciting information from family and friends' influenced the use of CAM. Another Canadian study using semi-structured personal interviews among patients of a family medicine and four different types of CAM (Kelner and Wellman 1997) has shown that 36% of CAM users reported that they chose to use an alternative therapy because it was suggested by others who had been helped.

Breuner et al. (1998) in a survey on CAM use among homeless youth in the U.S.A. indicate that one of the main reason for using CAM was 'friends use CAM and recommend it'. Astin (1998) in a national sample study in the U.S.A. contends that the decision to use CAM depends on the influence of significant others who have used or not used various alternatives. Astin assumed that a large amount of unexplained variance in the reason for CAM use might have been attributed to the existence of the influence of important others.

Kristoffersen et al. (1997) in a study on the prevalence of CAM products among patients presenting to an emergency department of a hospital in Sydney found that about 36% of all CAM preparations were recommended by a friend or family members.

In summary, a review of the CAM literature has shown that a dissatisfaction with, and the limitations of, Conventional Medicine, perceived positive aspects of CAM, personality traits, specific health conditions, and external cues to action are all contributing factors to the use of CAM.

2.4 Purchasing Behaviour and Health Behaviour

There have been many theories of purchasing behaviour in the marketing field. For example, Howard and Sheth (1969) used a learning framework to model the purchasing process; Engel et al. (1968) modeled the purchasing process with a decision-making framework; and Bettman (1979) developed the information processing model for consumer choice. However, these theories have sometimes been criticised in that the comprehensive theories of purchasing behaviour are process theories attempting to describe and explain the process by which consumers reach purchasing decisions (Sheth

et al. 1991). Also Bettman's information processing model has been described as a theoretical model, process oriented, and not sufficiently variable oriented, thus having limitations in measuring consumer decision pathways and explaining the relative relationship of the concepts in the model (Howard 1989).

The research problem of the current study (i.e. why do some people purchase a Health Supplement Product, and others do not?) involves two main issues and related terminology. First, the term 'why' may imply a goal that people want to achieve through their purchase or a value that people put on the outcomes of the purchase. Second, the research problem implies the existence of individual differences regarding the decision to 'purchase' or 'not to purchase' a Health Supplement Product.

Bagozzi and Dholakia (1999) posit that much of purchase behaviour (or in a broader concept, consumer behaviour) is goal-directed. A 'Goal' is defined as a desired outcome in terms of the level of performance to be achieved on a task rather than to desire to take a specific action (Gauff 1992). Since all goals share a focus on a specific outcome (or value) that consumption can produce, Peter and Olson (1996) therefore define values as people's broad life goals.

Sheth et al. (1991) developed a classification of values relevant to consumer choice by responding to the questions of why and how people make specific consumption or purchase decisions. Sheth et al. postulate that consumers, before actually purchasing, must decide if the values they expect to receive warrant the required expenditures. According to the consumption values theory (Sheth et al. 1991), market choice

behaviour may be driven by any or all of the five[7] consumption values; *functional value, social value, emotional value, epistemic value,* and *conditional value.*

On the other hand, the issue of deciding whether or not to purchase involves the decision element of 'choice'. A decision involves a choice "between two or more alternative actions or behaviours" (Hansen 1976). Decisions always require choices between different behaviours. Choice, in the consumer decision-making context, is viewed as the outcome of the integration process by which knowledge is combined to evaluate two or more alternative behaviours and select one (Peter and Olson 1996). Alternative behaviours in the current research involve either 'purchase' or 'not to purchase'.

Howard and Sheth (1969) divided the consumer choice process, under extensive problem solving situations, into the choice of product class and choice of brand within the product class. Sheth et al. (1991) later extended this two-level choice into three levels or types of choices under the term of market[8] choice behaviours. The three levels of choices included: (1) buy versus no-buy choice: the choice to buy or not to buy; (2) product type choice: the choice of one product type over the other; and (3) brand choice: the choice of brand. The choice decision of either 'purchase' or 'not to purchase' in the research problem of the current research is consistent with the first level of market choice behaviour by Sheth et al., since the choice decision involves a decision to purchase or not to purchase a particular class of product (i.e. HSPs).

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[7] *Functional value* is acquired through functional, utilitarian, or physical attributes; *social value* through its association with one or more distinctive social groups; *emotional value* through association with feelings; *epistemic value* through the arousal of curiosity and/or contribution to novelty and knowledge; *conditional value* through situation that enhance functional or social value.

[8] A market is defined as a collection of users (consumers) who make choices among alternatives (Sheth et al. 1991).

However, what is a distinct characteristic in a consumer's choice decision to either 'purchase' or 'not to purchase' an HSP from the theories explained in the consumer behaviour field is that the purchase decision involves certain characteristics in health behaviour, which may be similar to, but not totally the same as consumer behaviour.

From the perspectives of goal-directed consumer behaviour (Bagozzi and Dholakia 1999), consumers' purchase and use of Health Supplement Products can be interpreted as seeking to obtain a goal of being healthy. Research on this behaviour may require consideration of theories of interdisciplinary fields such as psychology, health education, medicine, sociology, nutritional science, public health, and social science. According to Langlie (1979), the Health Belief Model, a model explaining and predicting health behaviour change, assumes that "good health" is a goal more or less common to all. Further, they postulate that differences in health behaviour[9] are due to differing perceptions influencing an individual's motivation to engage in action and on the more specific decision of what action(s) to take to most effectively reach this goal.

Considering that the vast majority of medical symptoms are self-treated by individuals (Dean 1981) and a significant portion of CAM use falls into the realm of self-care[10] (Eisenberg et al. 1993), knowing which factors are related to the self-care and/or preventive health care behaviour is important to predict those health behaviours. For this reason, the Health Belief Model is adopted as the theoretical framework to address the research problem of determining why some individuals purchase an HSP, and others do not.

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[9] Gochman (1982) defined *health behaviour* as "those personal attributes such as beliefs, expectations, motives, values, perceptions and other cognitive elements; personality characteristics, including affective and emotional states and traits; and over behaviour patterns, actions, and habits that relate to health maintenance, to health restoration, and to health improvement."

[10] Dean (1989) defines self-care as representing the range of behaviour undertaken by individuals to promote or restore their health.

In summary, although many purchasing behaviour theories in marketing can be applied to the research problem of the current study, the Health Belief Model (one of the most frequently used theories in the field of health behaviour science) was adopted as the basis of the theoretical framework, because consumer purchase and use of Health Supplement Products can be interpreted as behaviour seeking the goal of being healthy.

2.5 The Health Belief Model

Among many cognitive models which have been proposed to explain the differences in individual health behaviour, the Health Belief Model (HBM), as a model of decision-making under uncertainty (Kirscht 1974, Becker and McClintock 1967), is one of the most frequently cited and researched cognitive theories (Harrison et al. 1992, Gauff 1992, Janz and Becker 1984). While the HBM has also been applied in studies of other types[11] of health behaviours, such as 'illness behaviour' and 'sick-role' behaviour (Kirscht et al. 1976, Becker and Maiman 1975, Becker 1974a, Kirscht 1974), the current discussion focuses on the HBM used in the area of preventive health behaviour.

The following sections will first discuss the nature of the HBM, second explain the application of the HBM in the literature, and finally describe the elements of the HBM (refer to Figure 2.1).

[11] According to Kasl and Cobb (1966a,b), *Preventive health behaviour* is defined as "any activity undertaken by an individual who believes himself to be healthy, for the purpose of preventing or detecting illness in an asymptomatic state." *Illness behaviour* is referred to as "any activity undertaken by an individual who perceives himself to be ill, to define the state of his health, and to discover a suitable remedy." *Sick-role behaviour* is referred to as "any activity undertaken by an individual who considers himself to be ill, for the purpose of getting well. It includes receiving treatment from medical providers, generally involves a whole range of dependent behaviours, and leads to some degree of exemption from one's usual responsibilities." *Sick-role behaviour* included compliance with various types of regimens (i.e. anti-hypertensive regimens, diabetic regimens).

2.5.1 Nature of the Health Belief Model

Cognitive theories stress the important role of subjective speculations or expectations held by the subjects. Behaviour, in this perspective, is a function of the subjective value of an outcome and of the subjective probability (or "expectation") that a particular action will achieve that outcome (Rosenstock et al. 1988).

Rosenstock (1974b) postulates that the perceived value of an outcome and the expectation that a given action will result in that outcome are considered to influence behaviour. The HBM is a *value-expectancy* framework, in which both the behavioural decisions are made to avoid negatively valued outcomes (i.e. reduction of the threat) and also behaviour is predicted from the value of an outcome to an individual, and from the individual's expectation that a given action will result in that outcome (Becker and Maiman 1975, Kirscht 1974).

There are many different definitions of value. The Longman Contemporary English Dictionary 1995 defines value as '*the importance or usefulness of something*'. In the marketing field, *value* is referred to as '*the consumer's estimate of the product's overall capacity to satisfy his or her needs*' (Kotler 1997, p.10). Similarly, DeRose (1994) defines value as '*the satisfaction of customer requirements at the lowest cost of acquisition, ownership and use*' (p. 12). Value can therefore be understood as the perceived balance or net outcome of the positive (i.e. benefits) vs negative (i.e. costs or barriers) effects customers experience from purchasing and consuming products and services (MacStravic 1997). However, value in health behaviour can also be the desire to avoid illness or to regain or retain health (Strecher and Rosenstock 1997).

Expectancy is defined as '*the value that the person places on a given outcome, incentives*' (Baranowski et al. 1997, p.157). When the expectancy is translated into health related behaviour, expectancy can be referred to as the belief[12] that a specific health action available to a person would prevent or improve illness (Strecher and Rosenstock 1997).

2.5.2 Application of the Health Belief Model

The Health Belief Model was initially developed in the 1950s by a group of social psychologists (Rosenstock 1966, Kasl and Cobb 1966a, 1966b, Hochbaum 1958) in the U.S. Public Health Service in an attempt to understand the widespread failure of people to accept disease preventives or screening tests for the early detection of asymptomatic disease. For example, Hochbaum was concerned with identifying factors that were facilitating or inhibiting the participation in X-ray testing for the detection of tuberculosis and demonstrated that a particular action is a function of the two interacting variables; perceived susceptibility and perceived benefits.

Burns (1992) states that Kasl and Cobb's framework specified that the likelihood of a person engaging in preventive health behaviour depends on: (1) the amount of perceived threat from the disease in question; and (2) the perceived value of the action prescribed to reduce the threat, whereas Rosenstock's model expanded the 'cost' of taking action into a cost-benefits context where a person weighs the benefits of the preventive action against barriers and incorporates the 'external cues to action' into the model.

[12] A *belief* is referred to as 'a descriptive thought that a person holds about something' (Kotler 1997).

Although there have been several different versions[13] of the Health Belief Model, the earlier works performed by Hochbaum (1958), Kasl and Cobb (1966a), and Rosenstock (1966) can be credited with the origination of the Health Belief Model.

Since Hochbaum's survey (1958), many investigations have helped to expand and clarify the HBM and to extend it beyond screening behaviours to include preventative actions to sick role behaviour (Janz and Becker 1984, Becker and Maiman 1980, Kirscht et al. 1976, Kirscht 1974, Becker 1974a, Rosenstock 1974a).

The HBM has also been used to explain and predict various types of health behaviours, such as preventive health decision, self-care, diet and exercise, breast-examination, compliance with medical regimens, drink driving, smoking, and bicycle safety helmet use, and this is only a subset of the whole. The applications of the HBM and their citation are included in Appendix II.

Steers et al. (1996) in a study of HIV-preventive behaviour and ethnic differences summarise that preventive health behaviour is most likely to occur when perceived susceptibility, perceived severity, and perceived benefits are high and perceived barriers are low.

Strecher et al. (1997) indicated that a substantial amount of reported research has been based on either all or a subset of the elements of the HBM. Many of the HBM studies have purposefully omitted personality factors and demographic factors in order to focus on the cognitive variables in the HBM. However, some versions of the HBM (Burns

[13] The HBM for Illness behaviour (Kirscht 1974); the HBM for sick-role behaviour (Becker 1974b); and the Expanded HBM (Burns 1992).

1992, Becker and Maiman 1975, Kirscht 1974) suggest that these individual difference factors (i.e. personality and demographic factors) affect the major cognitive variables in the model.

2.5.3 Elements of the Health Belief Model

The Health Belief Model, as shown in Figure 2.1, consists of six main components: perceived health threat associated with the condition or illness; perceived susceptibility to and perceived severity of certain illnesses, perceived benefits of preventive action minus perceived barriers or costs to preventive action; various cues to action; demographic and socio-psychological variables (e.g. age, gender, personality); and likelihood of taking preventive health action, the criterion variable.

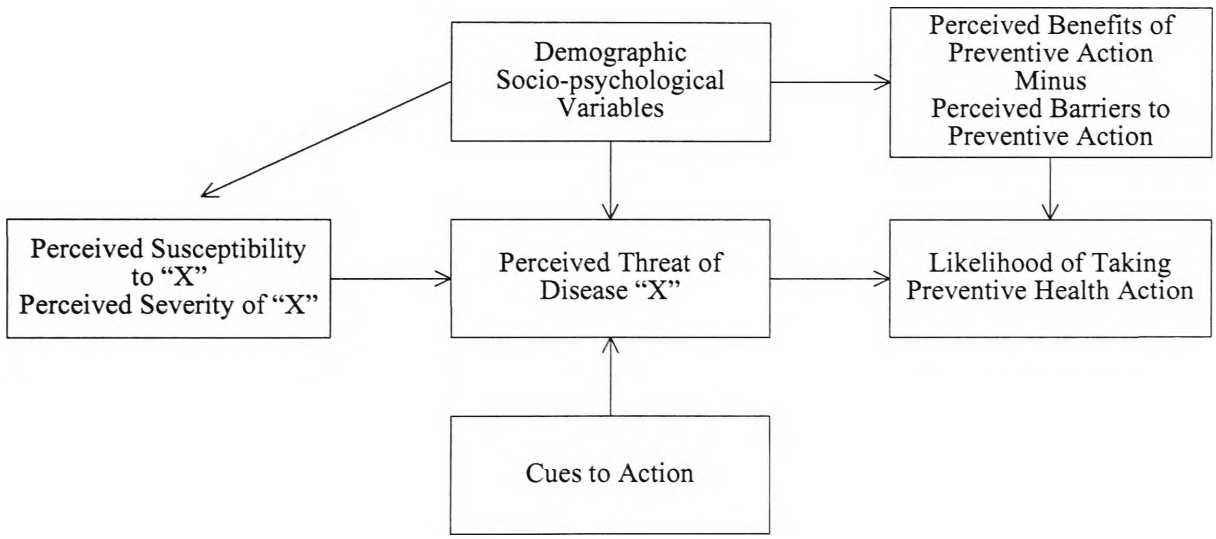


Figure 2.1 The Health Belief Model as Predictor of Preventive Health Behaviour.
Source: Becker and Maiman (1975), Sociobehavioral determinants of compliance with health and medical care recommendations, *Medical Care*, 13 (1), page 12

Perceived Threat

In Figure 2.1, 'perceived threat' has three antecedents: the 'perceived susceptibility' to and the 'perceived severity' of disease 'X'; demographic and socio-psychological variables; and cues to action. The 'X' refers to a potential illness or disease, which may be activated by either adopting or not adopting a specific health action. 'Perceived susceptibility' was defined as one's subjective perception of the risk of contracting an illness, whereas 'perceived severity' was defined as one's subjective perception about the impact of severity that the condition may have on his or her life (Strecher et al. 1997, Becker and Maiman 1975).

The HBM postulates that an individual's likelihood to engage in preventive health action can be predicted based on the individual's perception of susceptibility to and severity of disease 'X' (John and Miaoulis 1992), and that an intensified 'perceived severity' is required before 'perceived susceptibility' becomes a powerful predictor (Strecher and Rosenstock 1997). Even when an individual recognises personal susceptibility, action will not occur, unless he or she believes that contracting an illness would bring serious results.

Perceived Benefits and Perceived Barriers/Costs

In addition to 'perceived susceptibility' and 'perceived severity', there are two other cognitive variables, which appear under 'The Likelihood of Action', in the original Health Belief Model. They are (1) 'perceived benefits' of health action, and (2) 'perceived barriers' to health action. 'Perceived benefits' was defined as one's belief in the positive consequences of engaging in a particular health action to reduce

susceptibility to a serious health problem, whereas 'perceived barriers' was defined as one's perception of negative aspects of engaging in the health action (Becker and Maiman 1975).

Becker and Maiman maintain that even if an individual is at a high level of "readiness" (i.e. perceives a substantial amount of susceptibility and severity), the likelihood of health action (in this case "compliance behaviour") will depend on beliefs regarding the benefits of the recommended action in reducing the health threat. Thus, an individual exhibiting an optimal level of belief in both susceptibility and severity would not be expected to accept any recommended health action unless the actions were perceived as potentially effective. On the other hand, the potential negative aspects of a particular health action (or the 'perceived barriers'), such as financial, physical, and psychological difficulties, may act as impediments to undertaking the recommended behaviour. In relation to the 'perceived threat' and the 'perceived benefits minus barriers', Rosenstock (1974b) asserts that while the combined levels of "susceptibility" and "severity" provided the energy or force to act, the perception of "benefits" less "barriers" provided a preferred path of action.

In summary, according to the HBM theory, an individual is more likely to engage in a specific health behaviour, if he or she perceives a greater susceptibility to and greater potential seriousness of the health problem, and believes that more benefits than barriers exist in performing the health action. On the other hand, health action is least likely to occur if the individual perceives little or no personal susceptibility to the health problem, believes the problem not to be serious, and feels that more barriers than benefits exist in engaging the health action.

Cues to Action and Other Factors

In addition to the four basic elements (i.e. health beliefs) of the Health Belief Model, it has been suggested that 'cues to action' and other factors (e.g. socio-demographics and socio-psychological variables) influence an individual's health action.

It has been proposed that 'cues to action' or some stimuli are necessary to trigger a health action (Gauff 1992, Janz and Becker 1984). Hochbaum (1958) thought that the readiness to take action ('perceived susceptibility' and 'perceived severity') could be potentiated only by other factors and particularly by 'cues' such as an external event (e.g. mass media message, interpersonal interactions, or reminder postcards) or internal event (e.g. symptoms of possible illness) that prompted an action.

Rosenstock (1974b) argued that with relatively lower levels of perceptions of 'susceptibility' to or 'severity' of a disease, rather intense stimuli would be needed to trigger a response, whereas with relatively higher levels of perceptions of 'susceptibility' and 'severity', even slight stimuli may be adequate. Strecher and Rosenstock (1997) emphasised that 'cues to action' would have a greater influence on behaviour in situations where perceived threat is great.

However, only a few studies have been conducted to assess the contribution of 'cues to action' in predicting health actions (Harrison et al. 1992, Aspinwall et al. 1991). Hingson et al. (1990) asked the respondents in a general population study of adolescents about their beliefs concerning AIDS, alcohol and drugs: (1) whether they had read or heard about AIDS from media sources; (2) whether they had ever discussed AIDS with a family member, teacher, or physician; and (3) whether they knew someone with

AIDS. Becker and Maiman (1975) assumed that diverse factors such as age, gender, education, personality, and income might affect the individual's perceptions and thus indirectly influence health-related behaviour.

In summary, the HBM suggests that an individual's decision to undertake a health action is influenced by: (1) the 'perceived threat' associated with the condition or illness; (2) the 'benefits-barriers', an analysis of the advantages and disadvantages of the health prevention activity or consumption; (3) 'cues to action', which includes external and internal events; and (4) 'socio-demographics' and 'socio-psychological factors'.

In Section 2.5, the nature and origin of the HBM, the application of the HBM across various types of health behaviours, and the elements of the HBM were discussed.

2.6 Summary

This chapter has first described the developments in the health-care market in relation to CAM, which have provided the background for conducting this research. These developments in the health-care market have been explained in five areas: i.e. increasing usage and expenditure on CAM, the establishment of research centres and new government regulations on CAM, increasing acceptance of CAM in the Conventional Medicine sector, increasing health insurance coverage on CAM, and entry into the HSP market by traditional pharmaceutical manufacturers.

This chapter has then presented a review of the literature regarding CAM, which covered the explanation of the reasons for CAM usage. Theories of purchase behaviour

in marketing and the justification for the inclusion of a health behaviour theory into the current research were then explained. This was followed by a review of the Health Belief Model, the theoretical framework of the current research.

From this material, knowledge gaps will be identified and are discussed in Chapter 3 in terms of limitations of the previous studies on CAM and the Health Belief Model, and the inconsistent research findings.

Chapter Three
KNOWLEDGE GAPS IN PREVIOUS RESEARCH

3.1 Introduction

The previous chapter reviewed studies of Complementary and Alternative Medicine (CAM) and the Health Belief Model (HBM) in the literature. This chapter addresses knowledge gaps in previous research in relation to Health Supplementary Products (HSPs) and the HBM. The gaps relate to both limitations of previous CAM and HBM studies and inconsistent research findings in previous CAM studies.

3.2 Limitations of Previous CAM and HBM Studies

The limitations of the previous studies in relation to CAM and the HBM include: (1) lack of consumer behaviour perspectives; (2) sampling limitations and the consequent issues of limited generalisability of findings within and across populations; (3) lack of CAM studies applying the HBM; and (4) focus on cognitive variables in the HBM studies. Each of these limitations will be explained in the following sections.

3.2.1 Lack of Consumer Behaviour Perspectives

While there has been extensive research in relation to CAM in the fields of medicine, health and sociology, there has been only very limited published research in the field of marketing. The lack of marketing perspectives in the previous CAM studies can be found in two main areas. Firstly, most of the previous studies on CAM fail to take into

consideration the differences[14] between the product and the service type of CAM. While the service type of CAM (such as chiropractic and acupuncture) require the intervention of health-care CAM professionals as is the case in conventional medicine, Health Supplement Products such as herbal remedies or dietary supplements may not always require the intervention of, nor consultation with, CAM professionals. This means that self-treatment is a very important aspect of consumers' HSPs use. It has also been indicated that consumers make use of different forms of medicine on different occasions, and that the reasons and motives may differ in choosing a type of CAM over another type (Eisenberg et al. 1993, Thomas et al. 1991). In this study, unlike in most previous CAM studies, the focus was specifically on CAM products (i.e. Health Supplement Products) thus addressing a major knowledge gap in the literature.

Secondly, given that much research on CAM has been conducted in medical, health and sociological fields, the major research questions reflect the concerns associated with those fields. Research has addressed issues such as: (1) under which medical conditions do subjects use CAM? (Elder et al. 1997, McGregor and Peay 1996, Furnham and Kirkcaldy 1996); (2) what types of CAM were used? (Eisenberg et al. 1998, 1993, Astin 1998, Kristoffersen et al. 1997, MacLennan et al. 1996); (3) how do users of CAM perceive its effectiveness? (Astin 1998, McGregor and Peay 1996); and (4) what were the motives for using CAM? (Kelner and Wellman 1997, Lloyd et al. 1993).

The lack of marketing perspectives in the previous CAM research has constrained the understanding of consumers' purchase behaviour in relation to HSPs. Because products (or 'goods') and services types of CAM have quite distinctive differences, research

[14] Those special characteristics that distinguish services from products include intangibility, inseparability, heterogeneity, and perishability (Stanton 2001).

should adopt various approaches which take account of these differences. For example, research could focus on the two types separately or it could adopt a comparative approach. The current study focuses on the consumers' purchase behaviour with respect to the product type of CAM, that is, Health Supplement Products.

In contrast to those research questions which have appeared in the medical, health, and sociological fields, the present study has included research questions reflecting marketing perspectives. For example, identifying individual differences regarding consumers' HSPs purchase was one area of the current study's focus. In addition, the other influencing factors such as cost, convenience, and external cues to action, which may influence the likelihood of a consumer purchasing an HSP, have also been investigated.

3.2.2 Sampling Limitations

The second major limitation in previous CAM studies relates to the sampling limitations and the consequent issues of limited generalisability within and across populations which have resulted in major knowledge gaps in this field of inquiry.

A few national surveys targeting the general population have been carried out in the U.S.A. (Eisenberg et al. 1998, 1993) and in Australia (MacLennan et al. 1996). However, except for those national surveys, respondents were recruited from various health-care settings: e.g. physician's office or CAM practitioner's clinics (Fernandez 1998, Kristoffersen et al. 1997, Lloyd et al. 1993, Furnham and Bhagrath 1993). Therefore, such research did not include healthy people, rather, it included patients with

specific diseases: e.g. cancer (Begbie et al. 1996), hypertension (Brown and Segal 1996).

Hicky et al. (1988) suggest that health-enhancing behaviours undertaken by healthy people may be quite different from health-enhancing behaviours undertaken in the presence of serious or disabling illness. The majority of medical symptoms are self-treated by lay people (Dean 1981) and many forms of CAM are used for non-serious medical conditions, health promotion, or disease prevention and by self-treatment (Eisenberg et al. 1993). Similarly, a general population study by MacLennan et al. (1996) has shown that there is a high usage of CAM among healthy people and that chronically ill or disabled people are not amongst the major users of CAM. Therefore, there is a need for research to include healthy subjects who may undertake self-treatment with HSPs when they perceive their health problems as minor, and do not see such conditions as calling for the intervention of either conventional or alternative health-care practitioners.

3.2.3 Few CAM Studies Applying the Health Belief Model

The third major limitation in previous CAM studies is that the value of the HBM has not been studied thoroughly in explaining health behaviour in relation to CAM. To date, only a single study on hypertension patients (Brown and Segal 1996) has examined four health beliefs from the HBM in relation to different choice decisions between prescribed Western medicines and home remedies. However, Brown's study did not include the other elements of the HBM such as the 'cues to action'. Although certain cognitive variables in the HBM such as perceptions of seriousness of disease and risks (Wagner et al. 1999) and 'perceived susceptibility' to disease and illness (Furnham and Smith 1988,

e.g. 21 medical problems including infections, cardio-vascular problems, neurological and psychosomatic illness) have been included in the studies of CAM use, the HBM, as a whole model, has not yet been applied in explaining consumers' purchase behaviour in relation to Health Supplement Products.

The current study has attempted to use the HBM as a whole model and has also extended the HBM by the inclusion of personality traits to explain and predict the likelihood of a consumer purchasing a Health Supplement Product.

3.2.4 Focus on Cognitive Variables in Studies of the HBM

The final major limitation relates to the focus on cognitive variables in the HBM studies. As indicated by Janz and Becker (1984) in their comprehensive review on the HBM studies, many studies have focused only on four health beliefs (i.e. 'perceived susceptibility', 'perceived severity', 'perceived benefits', and 'perceived costs and barriers'), whereas 'cues to action' and personality traits have barely been investigated in HBM research. Other researchers suggested that 'cues to action' as well as socio-demographic, and personality traits may act as modifying variables for the four health beliefs (Fick 1992, Ferraro 1990, Knight and Hay 1989, Mullen et al. 1987, Becker and Maiman 1975). Harrison et al. (1992) and Aspinwall et al. (1991) comment that little attention in empirical studies of 'cues to action' has been made.

'Cues to action' which indirectly affect a health action can be divided into external and internal triggers or cues. Health motivation has occasionally been considered as an 'internal cue to action', whereas word-of-mouth and advertising can be classified into 'external cues to action'. Although health motivation has been included as an element in

the HBM (Becker and Maiman 1975) in explaining sick-role behaviours, the health motivation and the 'external cues to action' have not been frequently investigated in health behaviour studies (Strecher and Rosenstock 1997, Harrison et al. 1992, Janz and Becker 1984).

Conner and Norman (1996b) assert that there are two reasons why many HBM studies focus mainly on cognitive variables. These are that the development of the HBM was aimed towards health education or behaviour change, and secondly that the personality traits and 'cues to action' were regarded as more difficult to change compared to cognitive variables.

However, the study of personality traits and 'external cues to action' has significant implications in the fields of consumer behaviour. Marketing decision-making sometimes requires identifying consumers' psychographics, personality, life-style and demographics. The trait theory approach to personality attempts to classify people according to their existing characteristics or traits[15]. Identifying unique personality traits and sources of 'external cues to action' could be used to better understand consumer purchase behaviour in relation to Health Supplement Products, and assist marketing professionals in making marketing decision in terms of designing effective promotion, advertising, segmentation, and targeting strategies. For this reason, the current study has extended the original HBM through the inclusion of the personality traits (which will be discussed later in Section 4.2.1), and an attempt to investigate the source of 'cues to action' and their influence.

[15] A trait is defined as "any characteristic in which one person differs from another in a relatively permanent and consistent way" (Hillgard et al. 1975).

3.3 Inconsistent Research Findings

The inconsistent research findings in previous CAM research relate to two main issues. The first issue is that there are inconsistent results with the use of the 'health locus of control' construct in CAM studies. The second issue is that there are inconsistent findings on the relationships between socio-demographics and the use of CAM.

3.3.1 Internal Health Locus of Control

Studies incorporating the 'health locus of control', which has been one of the most widely explored personality traits as a potential determinant of people's choice decision in relation to CAM, have not always produced consistent research findings.

For example, a study on patients of conventional medicine and a homoeopathy in the U.K. (Furnham and Bhagrath 1993) has shown that there were significant differences in internal health locus of control between two groups of patients, but no significant differences in external locus of control (i.e. 'chance' and 'powerful others' control beliefs) between both groups. The homoeopathic patients believed that they had a degree of control over their health, and that something could always be done to improve their condition no matter how bad the illness. McGregor and Peay (1996) in a telephone survey in Australia also showed that self-control (i.e. internal) and provider control (i.e. powerful others) were significantly different between clients of Touch for Health (i.e. a form of CAM) and the general community sample.

Contrary to these findings, other studies (Berg and Arnetz 1998, Vincent et al. 1995, Furnham et al. 1995) have shown that there were no significant differences between

users and non-users of CAM with respect to 'health locus of control'. Similarly, Sutherland and Verhoef (1994) in a questionnaire survey on the patients of a conventional medicine clinic in Canada showed that health locus of control was not significantly related to CAM use but there was a trend that CAM users were less likely to be powerful others than were non-users.

These inconsistent results on 'health locus of control' between users and non-users of CAM may be attributed to the fact that there might be a certain factor which moderates the effect of the health locus of control on health behaviours in relation to CAM use. For example, it has been emphasised that to predict the potential of an individual engaging in health behaviour, 'health locus of control' should only be utilised in conjunction with an assessment of the value of health to the individual (Wallston 1992, 1991). Given the importance of measuring both the 'health locus of control' and 'value of health', as suggested by Wallston, the inconsistent results on CAM studies with the application of health locus of control may be due to the fact that few CAM research studies included both the 'health locus of control' and 'value of health' (i.e. 'health value') as potential determinants of using CAM.

3.3.2 Socio-demographics

There have been inconsistent findings on the relationships between socio-demographics and CAM usage. Eliason et al. (1997) in a telephone interview study on dietary supplement users visiting two health food stores in the U.S.A. showed that the typical customer purchasing dietary supplements was middle-aged, female, and had an education beyond high school. CAM studies on cancer patients (Downer et al. 1994, Lerner and Kennedy 1992, Cassileth et al. 1984) have reported that users of alternative

therapies tended to be young, female, and more highly educated. Similarly, population-based national studies (Eisenberg et al. 1998) have reported that users of CAM tended to be more educated, have higher incomes, and be between the ages of 35 and 49 years.

However, there have been no definite patterns in socio-demographics in relation to CAM use. For example, Astin (1998) found that among demographic variables only 'educational level' predicted CAM use. A study on cancer patients (Begbie et al. 1996) has shown that only 'age' produced significant difference in the use of CAM and other demographic characteristics such as gender and level of education were not significant predictors. Similarly, a study on dermatological patients in Sweden (Berg and Arnetz 1998) has shown that there were no significant differences between users and nonusers with respect to 'age' and 'gender'.

A population-based study in South Australia (MacLennan et al. 1996), which included three categories of age (i.e. 15-34, 35-54, and 55+) in the study, has shown that the use of CAM was most by the younger age group of 15-34. However, a nation-wide population-based study in the U.S.A. (Eisenberg et al. 1993) showed that the use of CAM was significantly more common among people 25 to 49 years of age than among those who were younger or older.

3.4 Summary

This chapter addressed the knowledge gaps in the previous CAM and HBM studies in terms of the limitations of, and the inconsistent research findings in, the previous research. Four limitations have been discussed. The first limitation has been related to the lack of consumer behaviour perspectives. Not only do most of the previous studies

on CAM fail to take into account the differences between the product and the service type of CAM, but also their research questions reflect the perspectives of health, medicine and sociology rather than that of consumer behaviour and marketing.

The second limitation has included the sampling limitations. Except for several population-based national surveys, the samples in some CAM studies were mainly recruited from various health-care settings. The importance of the inclusion of healthy subjects into CAM studies includes: (1) there are different motives for using CAM between healthy people and those with serious or disabling illness; (2) the majority of CAM users are healthy people; (3) CAM can be used either for treating disease and symptoms or preventing and maintaining health; and (4) Health Supplement Products are often used for self-treatment.

The third limitation concerns the lack of CAM studies applying the Health Belief Model. Only a limited number of researchers have attempted to investigate some elements of the HBM (e.g. cognitive variables such as perceptions on susceptibility and severity of certain diseases). No results are available regarding the whole HBM model for CAM. The final major limitation relates to the focus on cognitive variables in HBM studies. Unlike the four health beliefs within the HBM, 'cues to action' and personality traits have barely been investigated in HBM research. The inconsistent research findings in previous CAM research are related to two main issues: health locus of control and socio-demographic characteristics.

Chapter Four
RESEARCH QUESTIONS, CONCEPTUAL MODEL AND RESEARCH HYPOTHESES

4.1 Introduction

The previous chapter has discussed the knowledge gaps in the previous Complementary and Alternative Medicine (CAM) and Health Belief Model (HBM) studies in terms of the limitations of and the inconsistent research findings in the previous research. This chapter commences with a discussion of the three research questions addressed by this thesis. It then continues with a description of a proposed conceptual model, followed by rationale for each hypothesis with the justification for the inclusion of each variable. This chapter finishes with a discussion of the criterion variable, which is the likelihood of a consumer purchasing a Health Supplement Product.

4.2 Research Questions

As described in Section 1.3, there are three research questions to be addressed by this thesis.

These are:

1. Are certain personality traits associated with consumers' perceptions of the value of Health Supplement Products?

2. To what extent do the elements of the Health Belief Model explain and predict the likelihood of a consumer purchasing a Health Supplement Product?

3. Do age, gender, and education affect the likelihood of a consumer purchasing a Health Supplement Product'?

Research Question 1 will be discussed in Section 4.2.1, and Research Question 2 and 3 will be discussed in Section 4.2.2.

4.2.1 Personality Traits

Five personality traits have been included in the proposed conceptual model. A justification for the inclusion of each is given below.

Guilford (1959) defines traits as distinguishable, relatively enduring way(s) in which one individual differs from another. Traits are considered to be individual difference variables and are measured by personality scales (Buss and Poley 1976). Personality traits are often defined as the unique characteristics of the person: characteristics that consistently manifest themselves in different situations (McMartin 1995). Numerous studies support the influence of personality traits on behaviour (Funder 1991).

Conner and Norman (1996a) contend that personality factors have been either positively or negatively associated with health behaviour. Andersen and Newman (1973) classify personality traits or characteristics as predisposing factors that incline the individual toward the (dis)use of particular medical services. For example, Gould et al. (1993) in a study on allergy sufferers' medical choices, investigated personality traits (e.g. health

locus of control, health consciousness, and values on health care) as predisposing factors determining allergy sufferers' health care choices and utilisation.

Personality traits such as 'health locus of control' (Wagner et al. 1999, Furnham and Forey 1994), 'absorption' (Owens et al. 1999), and 'holistic views' (Murray and Shepherd 1993, Sharma 1992) have been investigated in some studies regarding CAM. However, not only there have been inconsistent results on personality traits in relation to CAM use, as discussed in Chapter 3, but also few CAM studies have focused systematically on the personality traits in relation to CAM use. Furnham and Beard (1995) studied the personality constructs such as "Just World Beliefs" and "Coping Styles" to distinguish a GP group and a CAM group, but found there were no significant differences between the groups. This insignificant finding might be attributed to the fact that, as Funder (1991) suggested, a behaviour may be affected by several traits at once, rather than by a single trait.

Booth-Kewley and Vickers (1994) add that personality traits and the Health Belief Model can complement each other in explaining and predicting health behaviours, one based on general behavioural predispositions, and the other on health-related motivations.

Personality traits specific to CAM use were identified from a review of the literature and the findings of the preliminary qualitative study. The personality traits studied in this study were 'internal health locus of control', 'health value', 'openness to experience', 'holistic orientation', and 'scientific health orientation'.

4.2.2 Elements of Health Belief Model

This section discusses Research Questions 2 and 3 in terms of: (1) reasons for using the Health Belief Model as the theoretical framework; (2) inclusion of perceptions regarding the general health threat; (3) external cues to action; and (4) socio-demographics.

First, the Health Belief Model (Becker and Maiman 1975), which has been used to explain and predict the likelihood of an individual engaging in a recommended health action, is one of the most widely used and proven models in health behaviour field (Janz and Becker 1984). Despite the model's popularity in the field of health behaviour, only a single study to date has utilised the HBM as the theoretical framework in a CAM study. Brown and Segal (1996) have attempted to use the HBM in explaining the use of home remedies and prescribed medicines amongst hypertension patients. However, substantial work with the HBM has been undertaken in health behaviour studies in fields other than CAM and this was discussed in detail in Chapter 2.

An individual's purchase of a Health Supplement Product (HSP) can be interpreted as a consumer's goal directed behaviour toward being healthy. Therefore, it is of value to extend the theory of the HBM to explain and predict whether or not an individual purchases an HSP (i.e. the 'likelihood of purchasing an HSP') for the purpose of preventing illnesses and maintaining a good health.

Second, as discussed in the literature review (Section 2.5), the HBM postulates that an individual's likelihood to engage in a health action can be predicted based on the individual's perception of threats of potential illness which may be activated by either

adopting or not adopting a specific health action (John and Miaoulis 1992). The reason perceptions regarding a *general* health threat was used instead of perceptions on a health threat *specific* to certain diseases or symptoms was because Health Supplement Products is a product category rather than a product, therefore it was impossible to use a specific health threat (e.g. The indications dementia and tinnitus in the case of Ginkgo Biloba purchase) in relation to the use of HSPs.

Third, the 'external cues to action' was included in the conceptual model. Even though Strecher and Rosenstock (1997) posit that 'cues to action' will have a greater influence on behaviour in situations where the perceived threat is great, researchers (Strecher and Rosenstock 1997, Harrison et al. 1992, Janz and Becker 1984) assert that 'cues to action' has rarely been studied in health behaviour studies. 'Cues to action' can be divided into internal cues, such as the perception of symptoms, and external cues such as mass media and interpersonal communications. Since the identification of existing external cues to action and the extent to which the external cues to action impact on the likelihood of a consumer purchasing an HSP, have important marketing implications (refer Section 8.5), the external cues to action was included in the proposed conceptual model.

Finally, it has been found that socio-demographic variables also influence various types of health behaviours. Many previous CAM studies have included socio-demographics, such as age and gender, as predictor variables. This study selected three key socio-demographics, i.e. age, gender, and education, since they had appeared most frequently in the previous CAM studies.

4.3 Proposed Conceptual Model

A conceptual model, as shown in Figure 4.1, was proposed to address the three research questions using a review of the extant CAM and HBM literature and the results of the preliminary qualitative study.

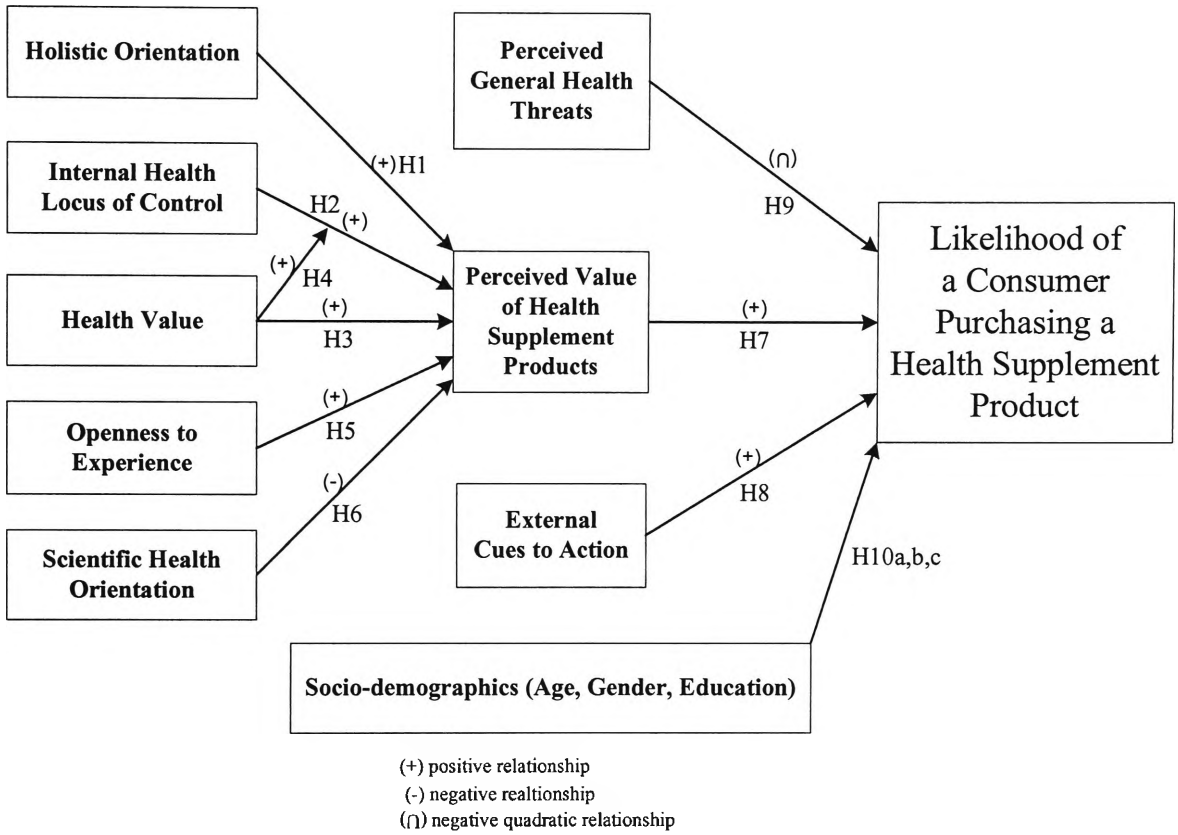


Figure 4.1 Proposed Conceptual Model in Explaining and Predicting the Likelihood of a Consumer Purchasing an HSP

This structure has been adopted since it is clear from the literature (refer Section 2.5) that the elements of the Health Belief Model (i.e. the 'perceived general health threats', the 'perceived benefits', the 'perceived costs or barriers', and the 'external cues to action') can be expected to affect the likelihood of a health action such as the likelihood of a consumer purchasing a Health Supplement Product in the current study.

Subsequently, since personality traits, as suggested by Becker and Maiman (1975), were expected to affect the individual's perceptions and thus indirectly influence health-related behaviour, the personality traits used here were regarded as antecedents of the perceived value of Health Supplement Products (HSPs) in the proposed conceptual model.

The model consists of nine predictors and a criterion variable. The predictors are personality traits (i.e. 'holistic orientation', 'internal health locus of control', 'health value', 'openness to experience', and 'scientific health orientation'), health beliefs (i.e. 'perceived general health threats' and 'perceived value of HSPs'), 'external cues to action', and socio-demographics (i.e. age, gender and education). The criterion variable in the proposed conceptual model is the likelihood of a consumer purchasing an HSP.

The postulated relationships between predictors and the criterion variable are illustrated with arrows and "Hx" denotes the corresponding hypothesis. A plus sign (+) indicates positive correlation; a minus sign (-) indicates a negative correlation. The symbol of (∩) indicates a negative quadratic (curvilinear) relationship.

These relationships in the model can be explained in three steps. Firstly, the model shows the correlations between 'perceived value of HSPs' and five personality traits such as the 'holistic orientation' (Hypothesis 1), the 'internal health locus of control' (Hypothesis 2), the 'health value' (Hypothesis 3), the 'openness to experience' (Hypothesis 5), and the 'scientific health orientation' (Hypothesis 6). These relationships are all positive ones with the exception of Hypothesis 6. Hypothesis 6 postulates a negative association between 'scientific health orientation' and 'perceived

value of HSPs'. The moderating effect of 'health value' on the relationship between 'internal health locus of control' and 'perceived value of HSPs' is explained in Research Hypothesis 4.

Secondly, the model shows the relationships between the likelihood of a consumer purchasing an HSP and its antecedent variables, the 'perceived value of HSPs' (Hypothesis 7), the 'external cues to action' (Hypothesis 8), and the 'perceived general health threats' (Hypothesis 9).

Finally, Hypothesis 10 proposes the relationships between the three socio-demographic variables (i.e. age, gender, and education) and the likelihood of a consumer purchasing an HSP.

The hypotheses derived from this model are:

H1: Consumers with a higher level of 'holistic orientation' tend to have a higher 'perceived value of HSPs'.

H2: Consumers with a higher level of 'internal health locus of control' tend to have a higher 'perceived value of HSPs'.

H3: Consumers with a higher level of 'health value' tend to have a higher 'perceived value of HSPs'.

H4: Consumers with a higher level of 'internal health locus of control' tend to have a higher 'perceived value of HSPs' when they have a higher level of 'health value'.

H5: Consumers with a higher level of 'openness to experience' tend to have a higher 'perceived value of HSPs'.

H6: Consumers with a higher level of 'scientific health orientation' tend to have a lower 'perceived value of HSPs'.

H7: Consumers with a higher level of 'perceived value of HSPs' tend to have a higher likelihood of purchasing an HSP.

H8: Consumers with a higher level of 'external cues to action' tend to have a higher likelihood of purchasing an HSP.

H9: There is a negative quadratic relationship between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP.

H10a: Consumers in the age group of 35 to 44 years tend to have a higher likelihood of purchasing an HSP.

H10b: Compared to men, women tend to have a higher likelihood of purchasing an HSP.

H10c: Consumers with a higher level of education tend to have a higher likelihood of purchasing an HSP.

4.4 Rationale for Each Hypothesis

This section presents the rationale for each hypothesis and justification of the inclusion of each predictor into the proposed conceptual model.

4.4.1 Holistic Orientation

'Holistic orientation' relates to the degree of a consumer's congruence with holistic views or principles. One distinct characteristic of the holistic principles is that it emphasises the importance of the connection of body, mind, and spirit (Goode 1996). Another distinct characteristic of the holistic principles is that it also recognises the body's own power of natural healing (Apostolides 1996, Otto and Knight 1979).

The holistic views or principles have been emphasised among consumers of various types of CAM in the literature. In a questionnaire survey among the patients of a cancer centre and pain management centre, and community samples, Owens et al. (1999) found a 'holistic health philosophy' among high consumers of CAM was predictive of CAM use. The high consumers of CAM showed particular interests in health-care that recognises individual differences. Dunfield (1996), in a questionnaire survey on the utilisation of non-conventional therapy, found that users of non-conventional therapy are significantly more likely to prefer the holistic approach.

On the other hand, Kelner and Wellman (1997) in a semi-structured interview study with 300 patients from a GP and four different CAM practices found that many patients of CAM practices reported that they had chosen an alternative therapy because they believed in it and in its principles.

Holistic beliefs were also mentioned among the users of CAM in qualitative studies (Murray and Shepherd 1993, Sharma 1992). These studies showed that the users of CAM believed in the body's natural ability to heal itself by re-establishing 'balance', and favoured the CAM practitioners' holistic views. Murray and Shepherd's study has shown that the interview respondents were against quick and symptoms-focused treatment approach of conventional medicine, but favoured the 'holistic' view of the patients' constellation of symptoms, personality and lifestyles by CAM practitioners.

Similarly, Vincent and Furnham (1996), even though they included only patients visiting CAM practices in their study, demonstrated that a 'holistic view' was the main reason for their CAM use. From factor analysis of the twenty reasons for using CAM, Vincent and Furnham found that the perceived value of a holistic approach was one of the most strongly supported reasons. In an explorative survey among 289 patients from eight different alternative therapy practices in Australia, Lloyd et al. (1993) conclude that the respondents valued the holistic approach of the alternative therapist. About 10% of the CAM patients group perceived that CAM therapists treat the causes of illnesses, not just the symptoms.

The congruency with holistic views among patients of CAM practices also appears in a study involving the product form of CAM. Wagner et al. (1999), in a telephone survey on 22 users of Saint John's Wort, conclude that Saint John's Wort use could be predicted from a philosophical acceptance of holistic natural health. Astin (1998) in a national population study in the U.S.A. could support his proposition that holding a holistic philosophy was a significant predictor of the reasons for using CAM.

The following excerpts of the preliminary in-depth interviews suggest how the empathy with holistic principles is important to CAM use. When the following question was asked, *"some people have an extensive experience with various types of CAM, but others do not. What factors do you think contribute to this difference?"*

A 50-year-old male respondent with postgraduate level of education, who appeared as having quite an extensive experience with various types of CAM in the interview conversation, replied that:

"People will just think these as different specialisations and will not understand that at the basis there's a holistic philosophy, a holistic concept, a holistic paradigm. If you understand that then I think you will say, OK, the acupuncture maybe has not worked, I will try something else. This doesn't work, I'll try something else". If a person accepts a holistic paradigm, I think they are more likely to try a range of alternative medicines. If they do not accept it, they do not have holistic paradigm, they will not try a range of alternative therapies. They might try one or they might try two. But they will not be open in general to alternative medicine."

Another respondent (female, 45-54 years old, technical college education, an office worker) expresses the importance of understanding every aspect of CAM, together with positive emotional feeling coming from CAM use as the reason why people continue to use one type of CAM or try another form of CAM.

"People understanding it more. Understanding it, feeling comfortable with it. Yes, that's what I would think. If they continue..."

The body's natural healing focusing on the balance of body, mind and spirit, and a slow and long process, together with an individualistic approach are characteristics of CAM.

Whether people understand and believe these holistic principles will influence their perceptions of the value of HSPs.

Thus, this thesis proposes that those who have a higher level of congruence with and are placing more value toward holistic principles will be more likely to have a higher perception of the value of HSPs. The hypothesis generated states that:

H1: Consumers with a higher level of 'holistic orientation' tend to have a higher 'perceived value of HSPs'.

4.4.2 Internal Health Locus of Control

The health locus of control, which is an extension of locus of control, posits that individuals with "internal" rather than "external" expectancies are more likely to take action to improve their health habits (Lau and Ware 1981, Wallston et al. 1978). The Multiple Health Locus of Control (Wallston et al. 1978, Wallston et al. 1976b) consists of three dimensions: the internal locus of control (IHLC), the chance external locus of control (CHLC), and the powerful others external locus of control (PHLC).

The health locus of control has frequently been investigated as an independent variable to explain the individual differences between users and non-users of CAM. However, the results have been inconsistent. Table 4.1 shows a brief description of CAM studies in which the 'health locus of control' belief was included.

For example, using a questionnaire survey on patients visiting a general practice and a homoeopath in the U.K., Furnham and Bhagrath (1993) have shown that there were significant differences in internal health locus control between the two groups of

patients but no significant differences in external locus of control (i.e. 'chance' and 'powerful others' control beliefs) between both groups.

Table 4.1 CAM Studies which Included Health Locus of Control

Researchers	Significant HLC*
Berg & Arnetz (1998)	*n. s.*
McGregor & Peay (1996)	IHLC, PHLC
Furnham & Kirkcaldy (1996)	PHLC
Furnham et al. (1995)	*n. s.*
Vincent et al. (1995)	*n. s.*
Furnham & Forey (1994)	PHLC
Furnham & Bhagrath (1993)	IHLC
Sutherland & Verhoef (1994)	*n. s.*
Furnham & Smith (1988)	PHLC

* HLC = Health Locus of Control IHLC = Internal Health Locus of Control
CHLC = Chance Health Locus of Control
PHLC = Powerful others Health Locus of Control
n.s. = not significant

The homoeopathic patients believed that they were more in control of their health. McGregor and Peay (1996) in a telephone survey in Australia also showed that self-control (i.e. internal) and provider control (i.e. powerful others) were significantly different between the clients of Touch for Health and the community sample.

In addition, even though some researchers have not empirically tested the 'health locus of control' as a construct, consumers of CAM have frequently mentioned themes suggesting 'internal health locus of control'. Such themes included 'favouring active participation' (Vincent et al. 1997), 'proactive' (Pawluch et al. 1994), 'empowering' (Lewith 2000), 'need for personal control' (Wagner et al. 1999, Astin 1998, Yates et al. 1993), 'self-responsibility' (Kelner and Wellman 1997), and 'active role' (Vincent and Furnham 1996, Begbie et al. 1996, Cassileth et al. 1984).

On the other hand, some studies have shown that the 'health locus of control' was not significantly related to alternative medicine use. Berg and Ametz's study (1998) has shown that the users of CAM believe to a larger degree that they can influence their own health, but there was no significant difference between users and nonusers with respect to 'health locus of control'. Sutherland and Verhoef (1994) in a questionnaire survey on the patients of a conventional medicine clinic in Canada showed that health locus of control was not significantly related to CAM use but there was a trend that CAM users were less likely to be powerful others than were non-users. Similar to the findings from Sutherland and Verhoef's study, a series of research by Furnham and his colleagues (Furnham and Kirkcaldy 1996, Furnham and Forey 1994, Furnham and Smith 1988) found that only external locus of control showed a significant difference between CAM and general practice (GP) patients, whereas chance and internal locus of control did not.

To the question of the benefits of CAM in the in-depth interviews, respondents who mostly have had an experience with CAM reported the benefits of CAM as 'looking after oneself', 'feeling more control', 'taking more responsibility', 'be more proactive', and 'feeling more involvement'. Excerpts are shown below:

[Female, age group of '45-54' years, postgraduate education, high school teacher]
"One of the big things is that it encourages individuals to look after their own health. It gives the individual the opportunity to really become more in touch with themselves in that way and be more sensitive to...and be more in control."

[Female, age group of '45-54' years, undergraduate education, nurse]
"...on the whole I think it seems to be giving you greater control, giving you greater responsibility and you tend to learn more about what is going on."

[Female, age group of '45-54' years, undergraduate education, health-care worker]
"Anyone using alternative therapy is already down the road of taking some control of themselves and taking some interest in what they are doing...using alternative medicines, you have to - again it's self responsibility thing - you have to know what you are doing...it encourages them to make be pro-active and involved in their own health-care."

[Female, age group of '18-24' years, undergraduate education, office worker]
"You also have control of that therapy because I think you know what you're getting and it's all explained to you,"

[Female, age group of '45-54' years, undergraduate education, primary school teacher]
"Whereas if you go to the doctor and you say well I've got a sore toe and she says there is nothing wrong with it, so well there's nothing wrong with it. But if I was real hypochondriac I could go to the health food shop and could I have myself full of stuff that I could take, whereas the doctor would have more control over that. For a doctor has much more control over what you take, whereas if you are really into alternative medicines you can try all sorts of things."

[Female, age group of '25-34' years, technical college education, office worker]
"I think to me it's also it does focus on your taking responsibility for yourself... the advantages are I think you are more active part with alternative."

[Male, age group of '45-54' years, postgraduate education, office worker]
"I think main factors are the possibility of self-help... they make you feel that you've taken responsibility - you are taking responsibility -which I think very important."

From the findings of the in-depth interviews and a review of CAM studies in relation to internal health locus of control, it is assumed that those with a higher internal health locus of control will tend to have a higher perception of the value of HSPs.

Thus, it is proposed that:

H2: Consumers with a higher level of 'internal health locus of control' tend to have a higher 'perceived value of HSPs'.

4.4.3 Health Value

The 'health value' was defined as the perceived importance or value attached to health by people (Lau et al. 1986). Rokeach (1973) argues that there are many instances where people's values guide their behaviours. Values, with respect to consumer behaviour in particular, have been shown to relate to purchase and consumer choice behaviour across several product categories (Homer and Kahle 1988, Pitts and Woodside 1983, Henry 1976).

In predicting health-related behaviours, Maiman and Becker (1974) emphasise the importance of measuring 'health value' with the combined measurement of other health beliefs. 'Health value' has been studied in relation to health-related behaviour, and positively correlated with preventive health behaviours (Kennedy et al. 1991, Kristiansen 1986, 1985, Wurtele et al. 1985, Walsh 1985).

Thus, it is proposed that:

H3: Consumers with a higher level of 'health value' tend to have a higher 'perceived value of HSPs'.

As discussed earlier in Section 4.4.2, research has shown that 'internal health locus of control' has positively correlated with preventive health behaviours (Waller and Bates 1992, Weiss and Larsen 1990). However, other studies failed to find such a relationship (Norman 1995, Steptoe et al. 1994). There have also been inconsistent results in the relationship between 'internal health locus of control' and CAM use. For example, Berg and Ametz (1998), Furnham et al. (1995), and Furnham and Smith (1988) found no

evidence that CAM use differed considerably across the 'internal health locus of control'.

The inconsistent results of the application of the 'internal health locus of control' may be explained by the fact that many studies did not include the 'health value' together with the 'internal health locus of control' as suggested by Wallston et al. (1980). Wallston et al. state, "*There is no theoretical reason to expect health locus of control to predict to health behaviour, unless it is used in combination with a measure of health value*" (page 211).

According to social learning theory (Rotter et al. 1973), or other expectancy-value approaches, the potential for a behaviour to occur is a joint function of expectations and perceptions of value. The health locus of control (HLC) is an expectancy construct indicating that a behaviour will lead to a positive outcome and becomes relevant where the outcome (i.e. good health) is valued (Wallston 1991). For this reason, only where good health is valued will HLC scores predict behaviour.

There has been some evidence showing that the two measures of 'internal health locus of control' and 'health value' are correlated with a specific health behaviour such as searching for health information (De Vito et al. 1982, Wallston et al. 1976a, Wallston et al. 1976b), modifying smoking (Kaplan and Cowels 1978) and nutrition behaviour (Hayes and Ross 1987), and performing more preventive health behaviours (Abella and Heslin 1984, Seeman and Seeman 1983, Lau 1982).

Thus, the 'health value' and the 'internal health locus of control' together are likely to be associated with the 'perceived value of HSPs'.

Thus, it is proposed that:

H4: Consumers with a higher level of 'internal health locus of control' tend to have a higher 'perceived value of HSPs' when they have a higher level of 'health value'.

4.4.4 Openness to Experience

Open individuals are curious, imaginative, and willing to entertain novel ideas and unconventional values, whereas closed individuals (those who are low in the openness to experience scale) tend to be conventional in their beliefs and attitudes (Costa and Widiger 1994, McCrae and Costa 1983).

In a telephone survey among Saint John's Wort (SJW) users in the U.S.A. (Wagner et al. 1999), those who had used SJW, expressed a willingness to experiment and try new things. Wagner et al. add that *'openness'* will increase the likelihood of choosing non-traditional treatment when combined with other variables such as a distrust of conventional medicine and placing a high value on personal control.

However, a study on cancer patients' CAM use (Begbie et al. 1996) indicated that it was not clear whether a willingness to 'try something different' resulted from the personal sense of despair in the face of the failure of conventional medicine treatment; or whether it was the product of the patients' existing attitude of 'openness to experience'.

Astin (1998) found that, contrary to his hypothesis, being a 'cultural creative' was not a significant predictor of primary reliance on CAM. One possible explanation for Astin's failure to prove his proposition might be that his construct of 'cultural creatives' did not include some of the characteristic elements of 'openness to experience'; as he assumed that a significant amount of unexplained variance of CAM use might have been due to the existence of other variables, such as general openness to novelty and experimentation, or curiosity.

Despite the inconsistent results on the concepts of openness to experience in relation to CAM use, there has been an additional support in the literature for the prediction that the 'openness to experience' would have an effect on CAM use, even though 'openness to experience' was not explicitly tested. In an individual differences study, Owens et al. (1999) found that a strong 'absorption' was a strong predictor of high CAM use. Owens et al. contend that being a 'cultural creative', having had a transformational experience that changed the person's world view, and believing in the importance of body, mind, and spirit in treating health problems (holistic health philosophy) have all been found to be predictive of CAM use and are all related to 'absorption'.

The themes inherent to the 'openness to experience' could be found in some of the CAM studies and such themes included: (1) 'curiosity'; (2) 'willingness to try new things'; (3) 'unconventionality'; and (4) 'open-mindedness'. First, Mitzdorf et al. (1999) included patients' curiosity about CAM therapies as possible factors favouring an alternative medicine hospital. Second, Berg and Arnetz's (1998) study with dermatological patients who were using CAM showed that one of the most common reasons for CAM use was that they 'wanted to try everything'. Third, in McGregor and

Peay's (1996) study, the 'unconventionality' was found to be one of most distinguishable variables in user group of Touch for Health, a type of CAM, even though the conceptual definition of this term was not clearly described.

Finally, Goode (1996) upholds that the central idea of the holistic approach is its open-mindedness and willingness to take the best from a variety of sources.

The following excerpts from the in-depth interviews show the concept of the openness to experience that was frequently mentioned among those who have experience with CAM.

[Male, age group of '35-44' years, undergraduate education, hospital worker]

"So I don't dismiss alternative medicine as experimental. In a lot of ways it may be wrong, it may be right. But I'm certainly not dismissing it."

[Female, age group of '45-54' years, undergraduate education, health-care worker]

"I read about them and I keep an open mind. I'm not concerned about the fact that a lot of them haven't been scientifically tested. That doesn't bother me at all".

[Female, age group of '18-24' years, undergraduate education, office worker]

"I think that people are a little more open minded now and are willing to try anything."

[Female, age group of '45-54' years, undergraduate education, nurse]

"If I try it...I'm not afraid to try something. If it works, well and good. If it doesn't then I haven't lost much."

[Female, age group of '25-34' years, technical college education, office worker]

"I will try it and not try too many things at once. Just try one and see if that works."

[Female, age group of '45-54' years, undergraduate education, health-care worker]

"I thought it was worth a try".

[Male, age group of '65 +', undergraduate education, retired]

" I try everything that, you seek advice and the advice may be try the alternate, and if that doesn't work the advice would be try the conventional. Try both. You know, you've got to experiment to keep yourself. So you take a look for all answers, and try anything. Anything that works, whatever works..."

It is therefore assumed that those with a higher level of openness of experience will be more likely to have a higher perception of the value of HSPs.

Thus, it is proposed that:

H5: Consumers with a higher level of 'openness to experience' tend to have a higher 'perceived value of HSPs'.

4.4.5 Scientific Health Orientation

Scientific health orientation was defined as a perception that science was important and that science was important to health-care improvement (Gould and Plank 1987). Thus, people with a high 'scientific health orientation' would use scientific reports to make health-related decisions, believing that science is relevant to helping them make those decisions (Plank and Gould 1990).

Furnham et al. (1995) (n = 256), and Vincent et al. (1995) (n = 216) tested scientific health beliefs among patients of a general practice and three different types of CAM practices (osteopathy, homoeopathy, and acupuncture). The study by Furnham et al. has shown that the GP group had most faith in medical science, placed least importance on state of mind, were least concerned with the harmful effects of medical science, and

showed most support for the use of scientific methodology. In contrast, the acupuncture group expressed significantly less faith in medical science than any of the other three groups; it placed most importance on a healthy state of mind; it was concerned about the harmful effects of medical science; and it showed least support for scientific methodology. The study by Vincent et al. has also shown that the acupuncture group attached significantly less importance to science than the general practice group, whereas the osteopathy and homoeopathy groups did not show any significant difference with the general practice group.

From the preliminary qualitative study, it was found that those who have a limited experience with CAM were sceptical about the lack of scientific evidence on CAM and reported this as a reason why he or she did not believe the efficacy of CAM. The scepticism toward CAM was expressed as 'quackery' or 'heresy', and respondents felt that CAM is supported only by anecdotal evidence and may be more dangerous. Conversely, these respondents reported conventional medicine as "tried and true" and, therefore, safe and effective.

The following excerpts describe the importance of scientific evidence among those who have a limited experience with CAM.

[Female, age group of '45-54' years, postgraduate education, high school teacher]
"I think they would all have to be grounded on some professional scientific foundation, with evidence. If it is founded on some scientific research then it's fine."

[Male, age group of '25-34' years, postgraduate education, university worker]
"All I'm saying is, what a lot of doctors say, more research. Right. If it works they'll use it. A doctor will teach alternative medicine if you can prove to him, because they are trained as scientists, to look at the evidence that it works. And that's why you know the sooner there are more scientific studies, the better it will be."

[Male, age group of '35-44' years, undergraduate education, hospital worker]
"I think that Acupuncture, people don't know 'how could this possible fix the problem?" A lot of people had their doubts because they can't see why it works..."

A male Chinese aged between 35 and 44 with a postgraduate level of engineering science degree and having spent most of his life in China, expressed his scepticism about the effectiveness of herbs as below:

"Sometimes people question this and say 'how can the plant cure this illness?' Also myself, for me I most often chose to use Western medicine. I don't trust too much about the Chinese medicine. That's my opinion."

Therefore, it is assumed that whether or not a person has a faith in the scientific evidence or health beliefs may act as either 'barriers/costs' to or 'benefits' of HSP purchase.

Thus, it is proposed that:

H6: Consumers with a higher level of 'scientific health orientation' tend to have a lower 'perceived value of HSPs'.

4.4.6 Perceived Value of Health Supplement Products

According to the theory of the Health Belief Model (Becker and Maiman 1975), the 'perceived benefits minus barriers' consisted of two separate concepts of 'benefits' and 'costs or barriers'. Similarly, the 'perceived value of HSPs' construct was defined as a consumer's cost-benefit analysis in relation to the purchase of Health Supplement Products. The 'perceived benefits of HSPs' was termed as one's belief in the positive

consequences of using HSPs to reduce susceptibility to a health problem or to increase general well-being, whereas the 'perceived costs or barriers of HSPs' referred to perceptions about negative aspects of using HSPs.

A comparative study of the use of home remedies and prescribed medicines amongst hypertension patients (Brown and Segal 1996) has reported that the respondents were more likely to use home remedies when their beliefs in the benefits of home remedies outweighed any concern with the associated costs or barriers. Similarly, in a nation wide mail survey in the U.S.A., Astin (1998) concluded that the perceived benefits of various types of CAM were considered to be potential determinants of CAM use. Some researchers only gave only limited consideration to the question of whether CAM use was related either to the dissatisfaction with conventional medicine (Siahpush 1999, Berg and Arnetz 1998, Donnelly et al. 1985), or simply to the effectiveness of CAM (Owens et al. 1999). These studies did not evaluate the combination of the two dimensions: the benefits, on the one hand, and the costs or barriers on the other hand. For example, the most common reason for CAM use appeared as the positive effectiveness of CAM (Berg and Arnetz 1998, Breuner et al. 1998, Furnham and Kirkcaldy 1996, Vincent and Furnham 1996, Spigelblatt 1995), the safe nature of CAM (Wagner et al. 1999, Breuner et al. 1998, Kristoffersen et al. 1997, Lowenthal 1994) and the negative outcomes of CM (Wagner et al. 1999, Spigelblatt 1995, Murray and Shepherd 1993).

On the other hand, in marketing theory, perceived value has been viewed as a means-end chain of consumers' choice behaviour. According to the means-end chain model (Gutman 1982), consumers realise that their choice has consequences and some of these

consequences are desired by consumers because consumers have evaluated them through their individual sets of values. Gutman asserted that these values are produced by culture, society and personality and are desirable end-states of existence that play a dominant role in guiding choice patterns. Woodruff (1997) proposes a definition of consumer value, which captures this hierarchical concept:

"*Consumer value is a consumer's perceived preference for and evaluation of those product attributes, attribute performance, and consequences arising from use that facilitates (or block) achieving the customer's goals and purposes in use situation.*"

An important underlying assumption of the 'perceived value of HSPs' was that consumers are viewed as rational decision makers who, either before or after HSP use, assess the benefits of HSPs against the associated costs or barriers to maximise total utility. The utility model of preventive behaviour (Cohen 1984) views that all preventive behaviour is the consumption of those goods, services, and activities known to affect risk, and that levels of consumption depend on perceived benefits relative to perceived costs.

From this point of view, the 'perceived value of HSPs' can be viewed as consumers' subjective cost-benefit analysis of the likely outcomes from the purchase of HSPs, and thus that the level of perceived value of HSPs influences the likelihood of a consumer purchasing an HSP.

Thus, it is proposed that:

H7: Consumers with a higher level of 'perceived value of HSPs' tend to have a higher likelihood of purchasing an HSP.

4.4.7 External Cues to Action

The 'external cues to action' relates to an external event such as a mass media message, word-of-mouth, or advertising campaign that prompts health-related action. Phillips et al. (1999) assert that many aspects of health maintenance are closely related to symptom perception, in that symptoms are often the stimulus or cue that initiates action by individuals (internal cues). On the other hand, external cues such as word-of-mouth and mass media are also expected to influence the likelihood of a consumer purchasing a Health Supplement Product.

Anyinam (1990) indicates that a plethora of books, news reports, and TV programs have also tended to increase interest in CAM and have made many people aware that such therapies are options for dealing with several kinds of health problems. Among various types of information sources or external cues, Bennett (1996) argues that word-of-mouth recommendations are the most common introduction to CAM.

The evidence showing the influence of the 'external cues' has been reported in some of CAM studies. Sharma (1992) points out that referrals by family, friends and acquaintances have been shown to be particularly powerful factors which encourage people to seek out CAM practitioners. As Sharma demonstrated, it is personal recommendations that initially create interest; and it is personal assurances from others that later encourage use. In an Australian study of the prevalence of CAM use among 325 patients attending a general hospital (Kristoffersen et al. 1997), one third of interview respondents reported that their decisions to use CAM had been based on recommendations by friends and family members. In this study, when excluding the

proportion of self-treatment, this word-of-mouth from friends and family members was the information source that users of CAM relied upon the most.

Similarly, Breuner et al. (1998) in a survey on CAM use among homeless youth in the U.S.A. indicate that one of the main reason for using them was 'friends use CAM and recommend it'. Astin (1998) in a population-based national study in the U.S.A. contends that the decision to use CAM is situation-dependent, for example the influence of significant others who have used or not used various alternatives. Astin assumed that a large amount of unexplained variance in the reason for CAM use might have been attributed to the existence of the influence of important others.

Spigelblatt et al. (1994) in a study of CAM use by children in Canada found that parents cited word-of-mouth was one of the strongest motivating reasons for their choice of CAM. In another study on parents of 588 children with cancer in Canada, Fernandez (1998) found that information from family and friends significantly ($p < .0001$) influenced the use of CAM. Similarly, a study using semi-structured personal interviews among patients of a family medicine practice and four different types of CAM in Canada (Kelner and Wellman 1997) has shown that 36% of CAM users reported that they chose to use an alternative therapy, because it was suggested by others who had been helped.

Although external cues may act as either facilitating or impeding factors, the findings on external cues in relation to CAM use in the literature suggest that a high proportion of CAM users reported that their decisions had been influenced by important others. It is assumed that the external cues may elevate the level of confidence which might be

found as low among those who either have limited experience with, or does not have enough knowledge about Health Supplement Products.

Therefore, a higher level of 'external cues to action' tends to increase the likelihood of a consumer purchasing a Health Supplement Product.

Thus, it is proposed that:

H8: Consumers with a higher level of 'external cues to action' tend to have a higher likelihood of purchasing an HSP.

4.4.8 Perceived General Health Threats

The HBM posits that people may not be motivated to take a health action, if they have too low a level of perception concerning the severity of a certain illness, or that people are likely to take a health action, if they perceive themselves susceptible to a certain illness (Becker and Maiman 1975). The perceived threat is in essence a composite of a function of the 'perceived severity' to and the 'perceived susceptibility' of a certain illness.

In relation to preventive health behaviour, Becker and Maiman (1975) argued that both extremes (extremely low and high in the level of perceived severity) are associated with a low likelihood of taking preventive health action. On the other hand, in relation to self-treatment, Haug et al. (1989) contend that it is likely that people experiencing a symptom perceived as serious will tend to seek a physician's advice rather than relying on self-treatment.

In an interview with 325 people visiting the emergency department of a general hospital, Kristoffersen et al. (1997) found that the purpose of CAM use was mainly for the prevention or alleviation of minor illnesses rather than for the cure of major disease. An interview study with twenty general practice patients (Murray and Shepherd 1993) has shown that CAM treatments were used for minor ailments and first aid purposes and as prophylaxis for recurrent problems such as colds, headaches, and throat infection. Similar to the findings from the aforementioned studies, an open-ended interview study with the current users of Saint John's Wort (Wagner et al. 1999) has shown that the users perceived themselves as having mild depression. The users also reported that if they had been really depressed they would have sought professional medical-help.

The 'perceived threat' in the original HBM was replaced with broader non-specific perceptions of health threats (i.e. the 'perceived general health threats') measuring general categories of vulnerability to diseases and worry about illnesses. In addition to the severity and susceptibility elements of the health threat, 'perceptions on one's own health status' was added to the 'perceived general health threats'. The reason for the inclusion of the 'perceived general health threats' was based on the fact that Health Supplement Products is a 'product category' rather than a 'product', therefore the purchase of 'Health Supplement Products' is for the improvement of general health condition rather than for the treatment of a specific illness, as in the case of depression with Saint John's Wort, a Health Supplement Product used for depression.

The analysis of the preliminary in-depth interviews has shown that those who had had no experience with CAM reported that they had not needed it because they had perceived themselves as being healthy.

Thus, it is assumed that those who perceive a 'general health threat' as either severe or minor will be less likely to purchase Health Supplement Products (for self-treatment and preventative health), but those who perceive moderate levels of 'general health threat' will be more likely to do so. The relationship between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP can be illustrated as a negative quadratic (i.e. $\cap$) relationship.

Thus, it is proposed that:

H9: There is a negative quadratic relationship between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP.

4.4.9 Socio-Demographics

Even though this study primarily focuses on the relationships among the personality traits, individual health beliefs and the likelihood of a consumer purchasing an HSP, socio-demographics such as age, gender and education were also included as predictor variables and three research hypotheses were generated. The socio-demographics of CAM users in the previous empirical studies are shown in Table 4.2 (Australia) and Table 4.3 (other nations).

Table 4.2 Socio-demographics of CAM Users in Australia

Researchers	Subjects	Age	Gender	Education
Easthope et al. (1999)	Ac** Pts*	35-44 (18.9%), 45-54 (20.2%), 55-64 (16.6%)	Women (61.7%)	N/A*
Siahpush (1999)	Adults residents in VIC State (n = 787) Telephone interviews	N/A	N/A	N/A
Siahpush (1998)	Adults residents in VIC State (n = 209) Telephone interviews	Not Sig.*	Not Sig.	Not Sig.
Kristoffersen et al. (1997)	Pts (n = 325) in an Emergency department in Sydney	Not Sig.	Women	Not Sig.
MacLennan et al. (1996)	General population in SA	Aged between 15-34	Women	Post secondary
McGregor & Peay (1996)	TFH** (n = 85) and non-TFH (n = 81) clients	Not Sig.	Not sig.	Not Sig.
Begbie et al. (1996)	Cancer Pts (n = 319)	Young	Not sig.	Not Sig.
Yates et al. (1993)	Cancer Pts (n = 152)	Aged 41-60	Not sig.	N/A
Llyod et al. (1993)	CAM* Pts in Sydney	30-39 (27%), 40-49 (28%)	Women (71%)	Secondary or below (52%) Tertiary (47%)
Donnelly et al. (1985)	Families of Asthma Children (n = 128) & non-asthma (n = 110), Questionnaire survey	Not Sig. in parental age	N/A	Not Sig.
Parker & Tupling (1977)	CM* Pts (n = 144) & CAM Pts (n = 315): Chir (n = 228); Ac (n = 48); Nat (n = 39)	Not Sig.	Not Sig. but only differ in Ac group having a female	N/A

* CAM = Complementary and Alternative Medicine CM = Conventional Medicine Pts = Patients N/A = Not Applicable Sig. = Significant

** Ac = Acupuncture Chir = Chiropractic
Nat = Naturopathy TFH = Touch For Health

Table 4.3 Socio-demographics of CAM Users in Other Nations

Researchers	Subjects	Age	Gender	Education
Astin (1998, USA)	General Population (n = 1,035), Mail survey	Not Sig.*	Not Sig.	Higher
Eisenberg et al. (1998, USA)	General Population (n = 2,055), Telephone survey	35-49	Women	Higher (college)
Eisenberg et al. (1993, USA)	General Population (n = 1,539), Telephone survey	25-49	Women	Higher (some college)
Berg & Arnetz (1998, Sweden)	Dermatology Pts (n =118), Questionnaire survey	Not Sig.	Not Sig.	N/A*
Elder et al. (1997, USA)	Pts* (n =113) at Family Practice, Questionnaire survey & focus group study	Not Sig.	Not Sig.	Not Sig.
Furnham & Kirkcaldy (1996,Germany)	Pts (n = 202) of GP, remedial therapists, Hom**	Older (CAM* group)	Women (Hom)	Not Sig.
Furnham et al. (1995, UK)	Pts from a GP and three AM practitioners (Ost, Hom, Ac)**, Questionnaire survey (n = 256)	Differ between 4 groups (GP group: oldest)	Not Sig.	Not Sig.
Furnham and Beard (1995, UK)	Pts (n = 187) at General Hospital, several GP surgeries and Ac & Sh clinics**	Younger (CAM group)	Women (CAM group)	N/A
Vincent et al. (1995, UK)	Pts (n = 216) from a school of CAM (Ost, AC, Hom)**, or a GP** 145 (67%) were female	Not Sig.	Not Sig.	Higher (Ac group) But Not Sig.
Furnham & Forey (1994, UK)	A GP's Pts (n = 80) & a variety of AM practitioners' Pts (n = 80)	Not Sig.	Not Sig.	Not Sig.
Furnham & Bhagrath (1993, UK)	Pts visiting a GP surgery (n = 80) and from outpatient dept. at a homoeopath hospital (n = 80)	Marginally older (Hom) than GP pts	Not Sig.	Not Sig.
Murray & Shepherd (1993, UK)	GP Pts (n = 372), Questionnaire survey	Not Sig.	Not Sig.	N/A
Furnham & Smith (1988, UK)	Beliefs and behaviours of pts visiting a GP (n = 45) and a homoeopath (n = 42)	Not Sig.	Not Sig.	Not Sig.

*CAM = Complementary and Alternative Medicine CM = Conventional Medicine Pts = Patients N/A = Not Applicable Sig. = Significant

** Ac = Acupuncture Hom = Homoeopathy GP = General practice
Ost = Osteopathy Sh = Shiatsu

Age

The results on the age difference between CAM uses have been conflicting in various studies. Some studies have shown that there were no age difference between users and non-users of CAM (Astin 1998, Berg and Arnetz 1998, Siahpush 1998), whereas other studies have revealed that consumers of CAM tended to be young (Begbie et al. 1996), 15-34 (MacLennan et al. 1996), 30-49 (Lloyd et al. 1993), 25-49 (Eisenberg et al. 1998), 35-54 (Easthope et al. 1999), over 40 years (Yates et al. 1993).

Nation-wide population-based studies in the U.S.A. (Eisenberg et al. 1998, 1993) were used as the basis for developing a hypothesis on the relationship between age and HSP purchase, since those studies were considered to be very similar to the nature of the current study which focuses on the HSP purchase behaviour among a nation-wide adult population. Eisenberg and his colleagues found that the use of CAM was significantly more common among people 35 to 49 years of age than among those who were younger or older. However, rather than using the age category of 35 to 49 years, the age group of 35 to 44 years was used for the current study because both the Australian Census data and the preliminary qualitative study (i.e. the in-depth interviews) used this age category.

Thus, it is proposed that:

H10a: Consumers in the age group of 35 to 44 years tend to have a higher likelihood of purchasing an HSP.

Gender

While gender difference with regard to CAM use has been the focus of many studies, there have been inconsistent results. Some studies have shown that more women than men use CAM in Australia (Easthope et al. 1999, Kristoffersen et al. 1997, MacLennan et al. 1996, Lloyd et al. 1993), Canada (Kelner and Wellman 1997), Germany (Furnham and Kirkcaldy 1996), and the U.S.A. (Lerner and Kennedy 1992). On the other hand, other CAM studies in Australia (McGregor and Peay 1996, Begbie et al. 1996, Parker and Tupling 1977), the U.K. (Furnham et al. 1995, Vincent et al. 1995, Furnham and Forey 1994, Furnham and Bhagrath 1993, Murray and Shepherd 1993), the U.S.A. (Astin 1998, Elder et al. 1997), and Sweden (Berg and Arnetz 1998) have shown there was no significant difference between women and men with regard to CAM use.

Nation-wide population-based studies in the U.S.A. (Eisenberg et al. 1998, 1993) and South Australia (MacLennan et al. 1996) were used as the basis for developing a hypothesis on the relationship between gender and HSP purchase, since those studies were considered to be very similar to the nature of the current study which focuses on the HSP purchase behaviour among a nation-wide adult population. Those population-based studies have shown that females used significantly more vitamins, herbal medicines, mineral supplements, and homoeopathic remedies than males did. It is therefore postulated that women tend to have a higher likelihood of purchasing an HSP, compared to men.

Thus, it is proposed that:

H10b: Compared to men, women tend to have a higher likelihood of purchasing an HSP.

Education

The findings on the relationship between the level of education and CAM use have also been unclear. Some studies have shown an absence of a correlation between the level of education and CAM use (Siahpush 1998, Kristoffersen et al. 1997, Elder et al. 1997, McGregor and Peay 1996, Furnham and Kirkcaldy 1996, Furnham et al. 1995, Furnham and Forey 1994, Lloyd et al. 1993, Furnham and Bhagrath 1993, Donnelly et al. 1985), whereas other studies on cancer patients have shown that users of CAM tended to be more highly educated (Downer et al. 1994, Lerner and Kennedy 1992, Cassileth et al. 1984). On the other hand, Begbie et al. (1996) in a study on cancer patients showed no significant difference in the level of education between users and non-users of CAM.

Although there have been no uniform patterns in relation to the level of education and CAM use, population-based studies have reported that users of CAM tended to have a higher level of education compared to non-users. For example, Eisenberg et al. (1998, 1993), in a telephone survey, found that users of CAM tended to be more educated. Other population-based CAM studies (Oldendick et al. 2000, Astin 1998, MacLennan et al. 1996) have also found that a higher level of education was an indicator of the frequent use of CAM. Similarly, the preliminary in-depth interviews have also shown that the use of CAM was more extensive among those who had a higher education level (refer Table A7-2 in Appendix VII). Thus, it is proposed that:

H10c: Consumers with a higher level of education tend to have a higher likelihood of purchasing an HSP.

4.5 Likelihood of Purchasing an HSP

The criterion variable in the model is the 'likelihood of purchasing an HSP' construct. All voluntary purchase is preceded by an intention to buy, though not necessarily with a planned intention to buy (O'Shaughnessy 1992). O'Shaughnessy contended that although an intention to buy is not an unconditional promise to buy, expressed intentions and actual purchase are linked much more closely than wants and buys. In this study, whether or not consumers will purchase HSPs has been measured by using the expressed intention of purchasing HSPs, since behavioural intention is generally interpreted as the measurement of the actual behaviour itself in marketing and consumer research (Shiffman and Kanuk 2000). Also, given the time, costs and methodological difficulties involved in reporting or observing actual purchase behaviours at the market place, the measurement of the expressed purchase intention has been considered to be a legitimate method for the current mail survey research. The operationalisation of the construct, 'likelihood of purchasing an HSP', is discussed in Section 5.3.2 in detail.

4.6 Summary

This chapter introduced the three research questions to be addressed by this thesis. Each was discussed, and a conceptual model was presented which includes personality traits, health beliefs, external cues to action, and three socio-demographic variables. In addition, the accompanying hypotheses in the model and the rationale for each hypothesis have been discussed. The remainder of the thesis will address the empirical testing of these three research questions, commencing with Chapter 5, which describes the research methods in terms of research design, data collection methods, and data analysis. The results of empirical tests are described in Chapters 6 and 7.

Chapter Five
RESEARCH METHODS

5.1 Introduction

The previous chapter discussed the development of the conceptual model and the research hypotheses derived from it. This chapter begins with a brief overview of the research design employed in this study, including the objectives for the preliminary qualitative research and the subsequent mail survey. The ethical considerations involved in both studies are also discussed in this section. The next section provides descriptions of both data collection methods, notably the interview questions and process of the qualitative research, and the sampling strategy, survey instrument and administration of the quantitative research. This chapter concludes with a discussion of the data analysis methods used in both studies.

5.2 Research Design

Using 'sequential triangulation'[16], two phases of research were designed for this study since the results of one method were indispensable for planning the next method (Denzin 1970). The rationale for this approach was that both methodological approaches have inherent strengths and weakness that are complementary (Morse 1999, Kimchi et al. 1999). The major goal of sequential triangulation was to avoid the personal biases of investigation and overcome the deficiencies inherent in a single-method study, thus maximising the validity and the robustness of the findings (Denzin 1989b, Denzin

[16] Denzin (1970) defines triangulation in research as the combination of two or more theories, data sources, methods, or investigation in the study of a single phenomenon.

1970). The preliminary qualitative study (i.e. the in-depth interviews) was conducted as an initial exploratory stage and this was followed by the quantitative study (i.e. the mail-out survey).

A cross-sectional design was adopted as the appropriate research method for both the in-depth interviews and the mail-out survey since this study did not focus on consumers' behaviour change over time but on consumers' perceptions and attitudes toward Complementary and Alternative Medicine at a specific point in the time.

5.2.1 Preliminary Qualitative Research

The research problem addressed by the study presented here is the issue of why some people purchase Health Supplement Products (HSPs) and others do not. To address the research problem and associated three research questions, a preliminary qualitative study was designed and carried out. In order to understand why consumers take certain actions (i.e. purchasing HSPs in this study), the researcher must understand consumers' interpretations of events and actions (Berger and Luckmann 1979). Rice and Ezzy (1999) stress that the attempt to understand meanings and interpretations is at the heart of qualitative research. Essentially, qualitative research is best used for problems where the results will increase understanding, expand knowledge, clarify the real issues, generate hypotheses, identify a range of behaviours, explore and explain consumer motivations, attitudes and behaviour, identify distinct behavioural groups, or provide input to a future stage of research or development (Gordon and Langmaid 1988). Because of the nature of the research problems raised at the preliminary stage of this study and the knowledge gaps in the previous Complementary and Alternative Medicine

(CAM) studies, it was considered to be essential for the researcher to conduct qualitative research prior to the quantitative research.

The objectives of the qualitative research for this study were: (1) to better understand the attitudinal and motivational aspects which might affect consumers' purchasing behaviour toward CAM; (2) to confirm whether previously identified variables in the literature could be applied to Australian consumers; (3) to identify if there were any other important variables to help explain consumers' purchasing behaviour on CAM; and, finally (4) to develop testable research hypotheses and a theoretical model enabling the researcher to explain why some individuals purchase CAM and others do not.

Selection of Qualitative Research Method

The individual in-depth interview was selected as the appropriate qualitative research method after weighing its strengths and shortcomings against the other options of exploratory research methods. In spite of shortcomings of this data collection method (e.g. more time consuming and expensive than focus groups; do not generally get the same degree of client involvement as focus groups; and the success of any in-depth interview depends exclusively on the interviewer) (McDaniel and Gates 1999, Malhotra et al. 1996), the individual in-depth interview has several advantages over other types of qualitative research method.

Rice and Ezzy (1999) and Denzin (1989a) discuss the strengths of the in-depth interview: (1) in-depth interviews allow aspects of social life to be studied that could not be studied in any other way, and provide an excellent way of discovering the subjective meanings and interpretations that people give to their experiences; (2) in-

depth interviews also allow new understandings and theories to be developed; (3) in-depth interviews make it possible to tap both majority and minority opinion regardless of the dominance of personalities or problems of group processes; and finally (4) in-depth interviews provide an opportunity for people to discuss sensitive issues, which they would not otherwise talk about in front of other people (e.g. focus group interview).

The in-depth interviews focus on the meanings and symbols people attach to phenomena and draws on an interpretative theoretical framework (Schutz 1967). The interpretative theoretical framework views human beings as constructing action based on the meanings, which are continually constructed and reconstructed in interaction with the phenomena they encounter.

Two main research aims of the in-depth interviews in this study were to obtain preliminary insights into what consumers think or believe about Complementary and Alternative Medicines (CAMs), including why they purchase CAMs, and to obtain insights into the feelings, beliefs, or opinions that can help better understand consumer decision-making with respect to CAMs. Whilst the qualitative section of this research project was invaluable in developing the conceptual model and research hypotheses, the thesis mainly focuses on the findings from the quantitative research.

5.2.2 Mail Survey

The mail survey was selected as the quantitative research method for this study. The objective of the mail survey was to test the conceptual model and associated research hypotheses derived from the preliminary in-depth interviews and a review of the literature.

The primary advantages of administering a mail-out questionnaire survey include (1) lower costs; (2) more representative samples; (3) less potential for interviewer bias; (4) high perceived anonymity of the respondent; and (5) least susceptible to social desirability issues (i.e. since mail surveys do not involve any social interaction between the researcher and the respondent). In addition, mail surveys can reach geographically dispersed respondents (Zikmund 1997, 1994, Dillon et al. 1994, Biner and Barton 1990).

One of the big disadvantages of mail surveys has been their low response rates compared to personal and telephone surveys in general population samples (De Vaus 1995, James and Bolstein 1990, Yu and Cooper 1983). In mail surveys of randomly sampled respondents, without any pre- or post mailing contact, the response rate is typically less than 15% (Kumar et al. 1999, Zikmund 1994). The other disadvantages of mail surveys (Malhotra et al. 1996) include: (1) slow speed; (2) little control over the data collection environment; (3) low flexibility; (4) the possibility of misinterpretation of the questions or instructions, and (5) inability to check on the validity of the answers given.

5.2.3 Ethical Considerations in the Study

Ethical considerations are a significant issue in social research. Fontana and Frey (1998) emphasise that, as the objects of inquiry in social research are human beings, extreme care has to be taken to avoid any harm to them. Psychological harms such as stress, emotional distress, self-doubt, and so forth can result from in-depth probing into sensitive issues and emotional experiences that characterises these studies (VanManen 1990). Participants in qualitative studies can experience social harms such as damaged reputation or loss of income if their privacy is violated or socially unacceptable behaviours or thoughts are exposed. Such psychological or social harms may also arise as a result of a false impression by disguising the purpose of the research, an exploitation of the information gained from respondents during the course of a study, and a breach of confidentiality (Zikmund 1997, 1994).

To address the ethical issues arising from the in-depth interviews, the Human Ethics Application Form, the Covering Letter (Appendix III), the Consent Form (Appendix IV) and the Interview Guide (Appendix V) were submitted to and approved by the University's Human Research Ethics Committee prior to commencing the research. The information on ethical considerations to potential participants in the research project was described in the Human Ethics Application Form and the Covering Letter. Such information includes the nature and aims of the research project, the recruitment method of participants, the voluntary participation, the preservation of confidentiality and privacy of participants, the use and dissemination of research findings, and the storage of data. Similarly, for the mail survey the Human Ethics Application Form, the Covering Letter (Appendix VIII), the Reminder Letter (Appendix IX), and the Survey Questionnaire (Appendix X) were submitted to and approved by the University's

Human Ethics Committee prior to commencing the research. The University's Human Research Ethics Committee Approval Letters for both the in-depth interview and the mail survey are shown in Appendix VI.

5.3 Data Collection Methods

This section describes the data collection methods used in both the preliminary qualitative research and the quantitative research.

5.3.1 Preliminary Qualitative Research

Selection of Interviewees

The objective of sampling strategy in qualitative studies is fundamentally different from that in quantitative research. While the objective of sampling strategy in quantitative studies is to ensure that the sample is statistically representative and that the findings can be confidently generalised to the population from which the sample is taken ("statistical generalisation"), sampling strategy in qualitative research is more concerned with ensuring that a particular set of results from the sample or small collection of cases, or events can be generalisable to theoretical propositions ("analytical generalisation") and not to populations (Yin 1994). Non-probabilistic sampling was used for the preliminary qualitative research (i.e. the in-depth interview) since non-probabilistic sampling aims to select information-rich cases to examine social meanings and interpretations (Rice and Ezzy 1999) and to expand and generalise theories rather than for statistical generalisation (Yin 1994). The objectives of the in-depth interviews were to identify the key factors that may influence the consumers' decision to purchase

CAM, and to develop testable research hypotheses and a theoretical model enabling the researcher to explain why some individuals purchase CAM and others do not.

A triangular sampling strategy was used to select respondents for the in-depth interviews. Triangular sampling strategies (or multi-method approaches) have become popular among an increasing number of qualitative researchers not only to protect against bias and enhance the reliability of findings but also to achieve broader results (Mays and Pope 1996, Patton 1990, Denzin 1989b). As the triangular sampling strategy for the in-depth interviews, four different types of non-probabilistic sampling techniques (i.e. convenience, snowballing and opportunistic, and maximum variance sampling) were implemented in three stages.

Convenience sampling was used initially; that is, sample respondents were selected from among friends and acquaintances of the researcher hoping that variations would occur naturally. While conducting the interviews with the initial sample, interviewees were asked to suggest other people who may be willing to participate in the research, which led to snowball sampling (Biernacki and Waldorf 1981).

Secondly, unexpected opportunities were also used to recruit the interview participants or to gain access to a new site for the recruitment, which was a form of opportunistic sampling (Rice and Ezzy 1999, Patton 1990). For example, although a friend of the researcher was not interested in being interviewed, she introduced her neighbours and friends to be interviewed. On the other hand, an interviewee who was working in a hospital suggested that the researcher contact her colleagues who would be willing to take part in the interviews.

Finally, maximum variation sampling method, which aims to select individuals to demonstrate the widest possible variation in the variables included in the study, was used for the in-depth interview. Since the target population of the in-depth interview was adults aged 18 years and above (i.e. adult consumers), a wide range of different and independent sources such as varying age, gender, living areas, educational levels, ethnicity and professions were used to purposefully recruit those who were not included in the early stage of interviews. The aims of maximising variation were to increase the probability that the researcher would collect as many as possible of the factors that might affect variability of behaviour (i.e. consumer decision making on Complementary and Alternative Medicine), and to find differences among the groups in light of early findings and emergent theory. The attempts to understand the differences in the groups are likely to have important effects on the generality of scope of the theory (Glaser and Strauss 1967). The recruitment of the interviewees discontinued when no additional information was found or diversity of the interviewees was filled, i.e. when *theoretical saturation* (Glaser and Strauss 1967) point was reached.

Interview Questions

Open-ended questions on general topics and themes were used to elicit information from interviewees. Interviewees were thus encouraged to talk about a given topic in their own terms.

The interview questions were divided into two different groups. The first group consisted of general questions on health and health information sources. Two initial open-ended questions regarding health in general were asked for the purpose of "breaking the ice" and stimulating interviewees to reflect on their health events and

corresponding health behaviour. The second group of questions was mainly focused on the use of CAM, and focused on interviewees' knowledge, perceptions, attitudes and experience about CAM.

The Interview Guide (refer Appendix V), which included the interview questions on relevant topics, was prepared to enable the researcher to ensure all relevant issues were discussed while remaining free to concentrate on the ongoing interaction between interviewer and interviewee. However it was not possible, in many cases, to follow the questioning sequence in the Interview Guide because of the free-flowing nature of the interview conversation. The interview guide evolved throughout a series of interviews. When new lines of information emerged, these were subsequently integrated into the theme list where appropriate. Unproductive questions were dropped.

Administration of the In-depth Interviews

Once the approval for the project had been granted by the University's Human Research Ethics Committee, the introductory information letter or Covering Letter (Appendix III) was given to the potential interviewees. This was done either in person or by mail before arranging a face-to-face meeting for the interview. Six potential interviewees declined to respond to the interview. A total of sixty-five in-depth interviews were conducted from 17th January to 15th May 2000.

Interviews were conducted either at the interviewee's home or workplace, or at the interviewer's home in accordance with the preference of the interviewees. The respondent's rights in relation to the conduct of the interview (e.g. privacy,

confidentiality, voluntariness) were explained to the research participants prior to commencing the interview, together with a brief outline of the interview process.

At the beginning of the interview, the researcher engaged in informal conversation with the respondents in order to build rapport, while remaining close to the guidelines of the topics of inquiry. In the middle of the interview conversation, probing was frequently used. Each open-ended question was followed by a series of probes used to address specific topics. For example, when the interview respondents replied to the question of Complementary and Alternative Medicine experience, the probing question of either 'why did you use it?' or 'why didn't use it?' was followed.

All interviews were tape-recorded with the permission of each interviewee. At the completion of each interview, socio-demographic information (i.e. age, gender, education) and the signed consent form (refer Appendix IV) were collected. A small gift was delivered to each interviewee after the interview. The purpose of the gift giving was to thank the respondent's time and trouble. They did not know that they would receive a gift until it was given.

Of sixty-five interviews, three cases produced limited results (including a case of faulty recording, due to the noise from the outside of the interview place) therefore only sixty-two were available for transcribing. Of these sixty-two interviews, fifty-eight cases were one-to-one interviews, whereas four cases were one-to-two interviews which resulted from the unexpected involvement of the interviewees' spouse. As each case of one-to-two format interview was dealt as two separate cases (4 x 2 = 8), a total of sixty-six cases were completed for analysis (n = 58 + 8 = 66). The average time of the interview

was 40 minutes (the interviews ranged from 20 to 90 minutes in length). The recordings were transcribed for later analysis.

A major purpose of conducting the in-depth interviews was to better understand how consumers think and talk about CAMs. Not only did the analysis of the interview data confirm a potential utilisation of the Health Belief Model as a theoretical framework in explaining and predicting consumers' decision-making on the purchase of CAMs, but also the findings served to help the development of the conceptual model and the formulation of research hypotheses. Furthermore, the findings also ensured that the questionnaire used in the mail survey covered all the issues which are important to consumers, and that the same language that consumers use was used in the wording of the questionnaire.

5.3.2 Mail Survey

Sampling Strategy

Probability sampling was used for the mail survey. In contrast to non-probability samples, probability samples are more likely to produce representative samples by reducing sampling error and increasing the sample's accuracy (De Vaus 1995), thus enabling the researcher to make inferences or projections about the target population from which the sample was drawn.

Of the various types of probability sampling, proportional stratified sampling was used to ensure that appropriate proportions of the 'selected sample' should come from the different regions of the country for the survey. Proportional stratified sampling is a variation of simple random sampling and is designed to produce a more representative

and thus more accurate sample (Kumar et al. 1999, Zikmund 1997). By using proportional stratified sampling, random sampling error can be reduced because the groups are internally homogeneous but comparatively different between groups (Kumar et al. 1999, Zikmund 1997, Kinnear and Taylor 1996).

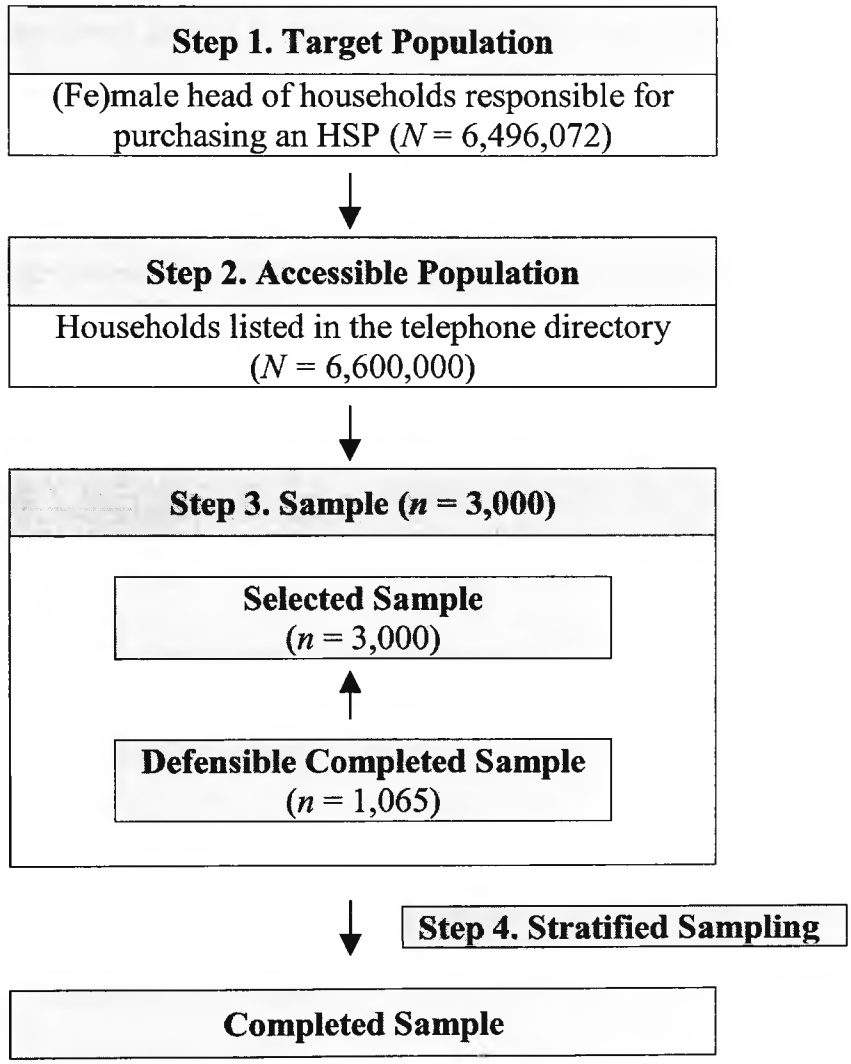


Figure 5.1 Sampling Process Used for the Mail Survey

Figure 5.1 shows the four steps of sampling process of the survey. The sampling process consisted of defining a 'target population' (Step 1 in Figure 5.1), selecting a 'sampling frame' (Step 2), determining a size of 'defensible completed sample' (Step 3) to be able to calculate the sample size of the survey (i.e. 'selected sample' in Step 3), and conducting sample selection (Step 4).

The elements of the 'target 'population' of the survey was defined as male or female (aged 18 years and above) head of households responsible for purchasing a Health Supplement Product, and was estimated as 6,496,072 (i.e. the number of households) from the census data (Australian Bureau of Statistics Report No. 3201.01 2001). Even though consumers of Health Supplement Products may include young people aged below 18 years, they were excluded from the target population since it was considered that the decision to purchase Health Supplement Products is generally made by their parents or guardians. In addition, the target population excluded small segments of the people living in institutions, e.g. military camps, jails, hospitals, college dormitories and people without a regular place of residence (the homeless). The sampling unit was set as each household in Australia. Adult Australians in households were regarded as general consumers of Health Supplement Products.

The 'accessible population' is defined as the group of participants to which the researcher can gain access, i.e. 'sampling frame' or 'sampling population' (Gliner and Morgan 2000). The 'accessible population' for this study was the households correctly listed in the telephone directories, and was sourced from a commercial electronic telephone directory database (i.e. Marketing Pro National™ PC Software, November 2001 Edition). As Dillman (2000) indicated, the primary reasons for using residential address listings obtained from the commercial database as the 'sampling frame' were not only that it listed quite a substantial number of residential addresses, but also its information was more regularly updated than the census data and the printed telephone directories obtainable, thus enabling the researcher to reduce the number of undelivered questionnaires. It was assumed that the difference in the number of households between that in the census data (6.5 million) and that in the commercial database (6.6 million), as

shown in Figure 5.1, was due to the fact that the available census data was collected in 1996, whereas the database (Nov 2001 edition) reflected the latest changes in residential addresses with some duplicate listings.

The 'selected sample' (or 'sample' in Step 3 in Figure 5.1.) was defined as the number actually selected from the accessible population to be included in the 'sample' (i.e. the number of households that the researcher had selected from the commercial residential address database). The 'defensible completed sample' referred to the sample size needed for desired level of precision in order to make population estimate (i.e. the number of households returning completed questionnaire that the researcher wish to obtain in the survey), whereas the 'completed sample' was defined as those of the 3,000 in the 'selected sample' who actually completed and returned questionnaire in the survey. The response rate was the ratio of the sample size of the 'completed sample' to the 'selected sample'.

Since the researcher was interested in estimating the proportion of population expected to choose one of the two response categories of the criterion variable (i.e. 'likely to purchase' and 'unlikely to purchase' a Health Supplement Product), rather than a mean, the 'defensible completed sample' was calculated by a statistical formula[17] using proportions. Sample proportion of "successes" ($\overline{P}$) in the current study was the proportion of 'likely to purchase a Health Supplement Product', whereas that of "failure" ($1-\overline{P}$) was the proportion of 'unlikely to purchase a Health Supplement

[17] $n = \overline{P}(1-\overline{P})\left(\frac{z}{E}\right)^2$: z (confidence interval in standard error unit), E (maximum allowance for random sampling error), $\overline{P}$ (a proportion of "success"), and $1-\overline{P}$ (a proportion of "failure") (Mason and Lind 1996b).

Product'. Since there was no previous data available on the sample proportion of 'likely to purchase an HSP' and 'unlikely to purchase an HSP', the sample proportion of "successes" was estimated based on the findings from a previous South Australian population-based survey (MacLennan et al. 1996) on CAMs usage, which had shown that approximately 48% of the respondents had used at least one non-medically prescribed CAMs (i.e. $\overline{P} = 0.48$). The researcher made a judgement about the maximum allowable error (E) of 3% at 95% level of confidence. Since the value of 'z' is 1.96 at 95% level of confidence, the 'defensible completed sample' was calculated as below.

$$0.48(1 - 0.48)\left(\frac{1.96}{.03}\right)^2 = 1,065$$

However, the 'defensible completed sample' cannot compensate for the risks of nonresponse error that result from obtaining a low response rate. Given the expectation about the low response rate of mail surveys in general population (Kumar et al. 1999, Zikmund 1994), the expected response rate of the current survey was used to obtain the 'selected sample'. The expected response rate was set as 35% by the researcher. Thus, the 'selected sample' was calculated by 1,065/0.35 = 3,042, and rounded as 3,000.

After determining the 'sample' size, 'sub-sample selection' using the proportional stratified sampling was carried out. As the target population was male or female head of households responsible for purchasing an HSP, it was necessary to ensure that appropriate proportions of the 'selected sample' should come from the different regions of the country. Stratifying by the States of the Commonwealth ensured that the sample holds exactly the proportions of households in each State as in the overall population.

The other reason for using State as the 'stratum' was that only State information was identifiable (as for the stratum) from the commercial telephone directory database.

As the first step of the proportional stratified sampling, the relative population size of the stratum (i.e. the number of households in each State) was calculated from the 1996 Census data (Australian Bureau of Statistics Report No. 2015.0 1997) and shown under the column of 'Households' in Table 5.1 (e.g. 33.5% in NSW and 24.5% in VIC).

Table 5.1 Number of Households, Selected Sample & Accessible Population

States	Households[i]		Selected Sample		Accessible Population[ii]
	N	%	*n*	%	*N*
NSW	2,174,917	33.5	1,004	33.5	2,216,338
VIC	1,591,657	24.5	735	24.5	1,652,061
QLD	1,204,072	18.5	556	18.5	1,267,306
WA	629,303	9.7	291	9.7	636,441
SA	555,834	8.6	257	8.6	546,507
TAS	175,197	2.7	81	2.7	185,247
ACT	106,686	1.6	49	1.6	114,704
NT	57,435	0.9	27	0.9	47,319
Others	971	0.0	0	0.0	0
Total	6,496,072	100	3,000	100	6,665,923

[i] Census Data from Australian Bureau of Statistics Report No. 3201.01 (2001)
[ii] Source: An electronic commercial telephone directory database (Marketing Pro™)

Secondly, the 'selected sample' size for each State was calculated by multiplying the proportion of households in each State by the 'selected sample'. For example, a sample size of 1,004 in NSW was selected by multiplying the proportion (33.5%) of NSW in the Census data by the 'selected sample' (n = 3,000). Similarly, a sample size of 735 was selected for VIC by multiplying the proportion (24.5%) by the 'selected sample' (n = 3,000). The 'selected sample' size for other States was shown under the column of 'Selected sample' in Table 5.1.

Finally, systematic random sampling with a sampling fraction of 1 / 2,165 was processed using the electronic commercial database (Marketing Pro National™) residential listings. A sampling fraction of 1 / 2,165 was calculated by dividing the size of the 'selected' sample (n = 3,000) by the total number of households (N = 6,496,072) in the Census. For example, if the fourth person on the residential listings of NSW was randomly selected as a starting point from the database, then every 2,165th person would be systematically selected from the starting point on the list. Thus, the sample would include the 4th, 2,169th, 4,334th person on the list, and so on, and would include 1,004 potential participants. The same process was applied to obtain the sample lists of other seven States. The database software provided the function of systematic random sampling and an alphabetically arranged list of the residential addresses, thus making the process of the sample selection and data management relatively straightforward.

The Survey Questionnaire

This section explains about the development of the mail survey instrument designed to test both the conceptual model (refer Figure 4.1) and the resultant twelve research hypotheses proposed in Section 4.3. The survey instrument was developed in three stages: the operationalisation of the theoretical constructs in the conceptual model, creating and refining the questionnaire, and pilot testing and revising the draft questionnaire. A summary of the mail survey instrument is shown in Table 5.2.

Table 5.2 Summary of the Mail Survey Instrument

Variable Type	Variable Name	No. of items	Variable Source	Question Type
Criterion Variables	Propensity to purchase an HSP in the next 12 months	1	Developed	6-point Likert type
	Purchase experience with HSPs in past 12 months	1	Developed	Dichotomous
	Purchase frequency of HSPs in past 12 months	4	Developed	6 categories
Predictor variables	Holistic orientation	5	Modified	5-point Likert
	Internal health locus of control	15	Modified	5-point Likert
	Health Value	4	Published	5-point Likert
	Openness to experience	9	Modified	5-point Likert
	Scientific health orientation	3	Modified	5-point Likert
	Perceived value of HSPs	9	Developed	5-point Likert
	External cues to action	8	Developed	5-point Likert
	Perceived general health threats	3	Modified	5-point Likert
Socio-demographic Variables	Age, Gender, and Education	3	From Census data	Ratio, Dichotomous, Nominal

Operationalisation of the Theoretical Constructs in the Conceptual Model

The conceptual model contained ten constructs which were derived from the analysis of the preliminary in-depth interviews and from a review of the literature regarding Complementary and Alternative Medicine and the Health Belief Model. The fourteen variables were firstly created to operationalise the constructs in the model, and categorised into three groups: the criterion, the predictor, and the socio-demographic variables. Secondly, each variable is measured by one or more questionnaire items (e.g. scales). Multi-item scales were used for all the predictor variables in the conceptual model. Such multi-item scales help get at the complexity of the concept (De Vaus

1995), and have been widely used in the marketing literature in order to measure a single concept with multiple attributes, thus reducing measurement error and increasing the reliability and validity of the measures (Zikmund 1997, 1994, Peter 1979). Thirdly, closed questions were used for all scales with the exception of age. Given that mail surveys most often have low response rates (Malhotra et al. 1996), closed questions were regarded as most appropriate since they are quick to answer and do not discriminate against the less articulate respondents (De Vaus 1995), thus reducing the response errors. Finally, all scales were integrated to create a survey questionnaire for pretesting.

Likelihood of Purchasing a Health Supplement Product

The 'likelihood of a consumer purchasing an HSP' construct was defined as the probability of whether or not a consumer purchases a Health Supplement Product. Three different types of criterion variables were developed to measure the 'likelihood of a consumer purchasing an HSP' construct.

The three variables were: (1) 'propensity to purchase an HSP'; (2) 'past purchase experience with HSPs'; and (3) 'purchase frequency of HSPs' in the past. The first variable, the 'propensity to purchase an HSP' was used to measure its relationship with other variables in the conceptual model. The second variable, the 'past purchase experience with HSPs', was used in order to determine whether there were any inconsistencies between past and future behaviour in relation to the purchase of HSPs. The third variable, the 'purchase frequency of HSPs' was used to measure the degree of experience with each type of HSP.

The 'propensity to purchase an HSP' variable was measured with one scale item on a six-point forced response format ranging from 'extremely likely' to 'extremely unlikely'. Since the 'propensity to purchase an HSP' focuses on alternative behaviours (i.e. 'likely to purchase' or 'unlikely to purchase' an HSP), it was regarded as appropriate to have one-item question to measure the 'likelihood of a consumer purchasing an HSP' construct. A six-point forced rating scale without a neutral or indifferent point was selected in order to force the survey respondents to express an opinion on their intention to purchase an HSP. The response options were 'extremely likely', 'very likely', 'somewhat likely', 'somewhat unlikely', 'very unlikely', and 'extremely unlikely' (scored from 1-6). Later, for statistical analysis, each response on the six options was transformed into 2 categories of response, a likely to purchase or unlikely to purchase. The question was "How likely is it that you will buy a Health Supplement Product in the next 12 months?"

The 'past purchase experience with HSPs' variable was measured with one question item on a dichotomous scale of 'Yes' or 'No'. Since the 'past purchase experience with HSPs' asks about the factual information about past experience with HSPs ('Yes' or 'No'), it was regarded as appropriate to have one-item question to measure this variable. The question was "Over the past 12 months, have you purchased one or more Health Supplement Products?

The 'purchase frequency of HSPs' variable was measured with four scale items based on each type of HSP (i.e. Vitamins/Minerals, Herbal remedies, Homoeopathic remedies, and Other HSPs). The same question was applied to the four scales, and was "How many times, if any, have you purchased each of the following types of Health

Supplement Products in the past 12 months?" Each question was measured on the six levels of frequencies: 'none', 'once', 'twice', 3 times', '4 times', and '5+ times'.

Holistic Orientation

The 'holistic orientation' construct was defined as the degree of a consumer's congruence with holistic principles or views, which emphasise the importance of the connection of body, mind, and spirit, and recognise the body's own power of natural healing (Apostolides 1996, Otto and Knight 1979). The holistic principle is that there are diverse causal agents in disease and health (Williams 1998). According to this perspective, the causal agents can be a complex interaction of physical, mental, emotional, spiritual, environmental and societal factors, so an illness or condition should be approached by looking at different areas for the possible cause and a variety of different methods. The holistic principle also emphasises the idiosyncrasy of CAM, in that CAM may not work in the same way for different people (Deliman and Smolowe 1982).

An initial pool of 'holistic orientation' scales was generated from the previous CAM studies in the literature and the preliminary in-depth interviews. In a study on the utilisation of non-conventional therapy, Dunfield (1996) generated fifteen items on the holistic approach from a cluster analysis of 114 attitudinal statements compiled from 27 separate interview sessions (individual and group). Siahpush (1999) created a scale of holism with five items with 4-point Likert type statements with response categories ranging from 'strongly agree' to 'strongly disagree'. Astin (1998) also included holistic philosophy in his study on CAM use. An example question of Astin's holistic

philosophy was "the health of my body, mind, and spirit are related, and whoever cares for my health should take that into account" ('yes' or 'no').

Overlapping or redundant question items were eliminated from the initial pool of scale items, and five potential scale items were selected on the basis of the judgement of the researcher. Also it was necessary to modify and reword some questions to fit a particular context and particular sample of this study since the author's sample population was quite different from the sample population of the other previous studies.

The 'holistic orientation' variable was measured with five question items on a 5-point Likert rating scale (i.e. 1 = 'strongly agree', 2 = 'agree', 3 = 'not sure', 4 = 'disagree', and 5 = 'strongly disagree'). Since differing item response formats increase the time and effort needed to understand and complete a questionnaire (Ware 1983), the decision was made to use a uniform five-point response format for all the predictor variables. Some examples of the 'holistic orientation' questions were: "Treatments of illnesses should concentrated on symptoms rather than the whole person"; "I think my body has a natural ability to heal itself"; and "Health is more than just keeping your body fit".

Internal Health Locus of Control

The 'health locus of control' (HLC) is a generalised expectancy that occurs when individuals have learned that outcomes are contingent or non-contingent on their health behaviours, and posits that individuals with "internal" rather than "external" expectancies are more likely to take action to improve their health habits, particularly when faced with evidence that changes may result in improved physical functioning (Lau and Ware 1981, Wallston et al. 1976a). A high score on the 'internal health locus

of control' indicates a person feels in control of his or her own health (e.g. "I am directly responsible for my health"), whereas a low score indicates a person feels health is largely due to chance and so beyond his or her own control; e.g. "People who never get sick are just plain lucky" (Wallston 1991).

The Multi-dimensional Health Locus of Control (MHLC) (Wallston et al. 1978, Wallston et al. 1976b) differs from the general locus of control in that the external locus of control was further divided into 'powerful others' (external provider control beliefs) and 'by chance' health locus of control (external chance outcome beliefs). Lau and Ware (1981) added a fourth dimension of 'general health', which was regarded as being associated with perceived susceptibility to a variety of specific diseases, to three constructs of the MHLC scale. However, as 'general health' is very similar to the perceptions on general health status, a component of the 'perceived general health threats' in the conceptual model, it was therefore regarded as logical to use the MHLC to avoid measuring a similar concept.

A subset of 15 items from the relevant subscales of an 18-item MHLC scale was used as the basis for the 'health locus of control' scale in this study. Wallston et al.'s (1978) MHLC scale was selected because the MHLC had been shown to have high predictive and discriminant validity (Grady and Wallston 1988) and to be internally reliable, i.e. *Cronbach's alpha* = 0.69, 0.74, and 0.62 for 'internal', 'powerful others' and 'chance' control respectively (Anderson et al. 1994).

Other HLC scales similar to the MHLC have been used in some of Complementary and Alternative Medicine studies. For example, McGregor and Peay's (1996) study on the

choice of alternative therapy used 7-item HLC scale stemmed from Lau and Ware's (1981) HLC scale. Lau and Ware's HLC scale with 7-point response format was also shown to be internally reliable (.65 to .70). However, the Lau and Ware's scale not only had too many items (i.e. 28 items), but it also consisted of four different dimensions ('general health threat' in addition to the original three expectancies of 'internal', 'chance', and 'powerful others'). On the other hand, the number of questions in Cockburn's (1987) HLC (4 items) and Jette's (1981) HLC (2 items) scales were regarded as too small and they showed relatively low *Cronbach's alphas* (Cockburn's items = 0.49, Jette's items = 0.53, 0.59).

Wallston et al.'s (1978) MHLC scale was, to some extent, modified for this study. First, 3 questions were dropped out of the original 18 questions to make the entire questionnaire as concise as possible. Second, the wording in some of the scale items were modified (e.g. from "When I feel ill, I know it is because I have not been taking care of myself" to "If I take care of myself, I can avoid illness") to make respondents better understand the questions. Third, unlike the Wallston et al.'s MHLC scale, which had six response options, this study used a five-point Likert rating scale.

The HLC scale used for this study consisted of three dimensions: 'internal health locus of control', 'powerful others health locus of control', and 'chance health locus of control' dimensions. Each dimension included five questions, and therefore the HLC consisted of 15 scale items. Each question item was measured on five-point Likert scales, and equally weighted. The HLC scale consisted of a total of fifteen question items. Some examples of the HLC questions were "If I become sick, I have the power to make myself well again" (i.e. 'internal health locus of control'), "It seems that my

health is greatly influenced by accidental happenings" (i.e. 'chance health locus of control'), and "Health professionals keep me healthy" (i.e. 'powerful others health locus of control').

Health Value

The 'health value' construct relates to the perceived importance attached to health by consumers (Lau et al. 1986). While the original formulation of the Health Belief Model was oriented toward the desire to avoid a specific disease threat (i.e. a negative health motivation), the 'health value' construct, as a positive health motivation, has been added to represent relatively non-specific differences in individuals' health interest in the proposed conceptual model.

Lau et al. developed a short 4-item 'health value' scale and tested its internal consistency reliability in five different population groups in the U.S.A. using two different response formats (i.e. one for 5-point and another for 7-point Likert response format). *Cronbach's alpha* scores of the 5-point format scale were 0.66 in 11-16-year-old-girls (n = 97) and 0.72 in parents of those girls (n = 95). The *Cronbach's alpha* scores of the 7-point format scale were 0.71 in ulcer clinic patients (n = 74) and university students (n = 1,026), and 0.63 in parents of those university students. Bennett et al. (1994) also used the same construct, with a change in the response format, to predict dietary behaviour in a larger U.K. sample (n = 15,489) and tested the internal consistency reliability of the 'health value' construct. The response format of the 'health value' construct used in Bennett et al. study was 6-point Likert type. The *Cronbach's alpha* for this scale was 0.66.

The current study used a 5-point scale of 'health value' developed by Lau et al., since the 5-point scale had a higher *Cronbach's alpha* score than the 6-point, and it produced a higher *Cronbach's alpha* score with the adults sample compared to the 7-point scale. The other reason was also based on the decision to use a uniform 5-point response format for all the predictor variables to reduce the survey respondents' time and effort needed to understand and complete questionnaire. The scale comprised of four attitudinal questions measured on five-point Likert scales. Examples of the 'health value' questions were: (1) "Good health is of minor importance for a happy life"; (2) "If you don't have your health, you don't have anything"; (3) "There are many things I care about more than my health"; and (4) "There is nothing more important than good health".

Openness to Experience

'Openness to experience' construct was defined as set of attitudes relating to willingness to try new activities, intellectual curiosity, a flexible approach to social and moral values, awareness and appreciation of emotional responses and artistic sensitivity (McCrae and Costa 1983). According to McCrae and Costa (1984), the individual who has a high level of 'openness' is generally more willing to entertain novel ideas and unconventional values, whereas the individual with low 'openness' tends to be conventional and conservative in outlook.

'Openness' was included as one of five dimensions[18] in the Revised NEO Personality Inventory (NEO PI-R™) (Costa and McCrae 1992). The 'openness' in the NEO PI-R™ was represented by six specific dimensions (i.e. fantasy, aesthetics, feelings, actions,

[18] Others include Neuroticism, Extraversion, Agreeableness, and Conscientiousness.

ideas, and values), and consisted of 48 items with 5-point response format. The internal consistency of each scale/facet ranged from .58 (actions) to .80 (ideas) in the employment sample (Costa et al. 1991). Roberts (2001) developed the OCEANIC (Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism Index Condensed) to measure the five global personality dimensions of openness, conscientiousness, extraversion, agreeableness, and neuroticism. The 'openness' dimension in the OCEANIC construct has 12 questions (*Cronbach's alpha* = 0.8) with 6-point response categories: never, rarely, sometimes, often, usually, and always.

The questions in the 9-item 'openness to experience' scale used in the current study were partly derived from the items of openness dimension in both the OCEANIC and the NEO PI-R™. After having two stages of pretesting, however, some of wording in the original questions were modified in order to ensure that respondents understand the intended meaning of the question. The 'openness to experience' scale used for this study consisted of 9 items. Each question item was measured on a five-point Likert scale, and equally weighted. Some examples of the 'openness to experience' questions were: "I find philosophical argument boring", " I would describe myself as a thoughtful person"; and "I always like to find out about things."

Scientific Health Orientation

The 'scientific health orientation' was defined as a perception that science was important, and that science was important to health-care improvements (Gould and Plank 1987). Hence, people with a high 'scientific health orientation' would use scientific reports to make health-related decisions, believing that science was relevant to helping them make those decisions (Plank and Gould 1990).

The 'scientific health orientation' scale used for this study was modified from Plank and Gould's (1990) 5-item 'scientific health orientation' scale (*Cronbach's alpha* = 0.70) measured on a five-point Likert scale. In the first stage of pretesting, two items were deleted from the original 5-item scale in the sense that two deleted items were measuring virtually the same concepts as the other items of the scale. In addition, the reduction of the total number of questions contained in the questionnaire was considered to be essential to reduce non-response error unless the reduction of the items does not affect its internal reliability score.

The 'scientific health orientation' scale used for this study encompassed three questions. Each question item was measured on a 5-point Likert scale, and equally weighted. Three questions were "I keep up with the latest scientific findings about health", "I have faith in science and scientists", and "I do not always believe what I read or hear about scientific findings on health".

Perceived Value of Health Supplement Products

The 'perceived value of HSPs' construct was defined as a consumer's cost-benefit analysis in relation to the purchase of Health Supplement Products. The 'perceived value of HSPs' construct was measured by a subtraction of the index score of 'perceived barriers or costs of HSPs' variable from that of 'perceived benefits of HSPs' variable. The 'perceived costs or barriers of HSPs' referred to perceptions about negative aspects of using HSPs, whereas the 'perceived benefits of HSPs' was termed as one's belief in the positive consequences of using HSPs to reduce susceptibility to a health problem or to increase general well-being. As there was no literature available on the construct of the 'perceived value of HSPs', the question items used to measure this construct were

mainly generated from the concepts that emerged from the analysis of the preliminary qualitative study data.

The 'perceived benefits of HSPs' construct contained five concepts derived from the analysis of the in-depth interviews. For example, the concept of 'less harmful' was extracted from the emergent theme that *"... herbal remedies are less harmful than conventional medicines*", whereas the concept of 'convenient' was from that *"... self-treating with herbal remedies is more convenient than going to see a doctor.*" These concepts or themes were frequently mentioned as the benefits of using Health Supplement Products among those who had experience with HSPs in the in-depth interviews. The other three concepts included as the 'perceived benefits of HSPs' were 'perceptions of effectiveness of HSPs', 'positive emotional feeling', and 'the benefit of using HSPs in general'. The scale of the 'perceived benefits of HSPs' included 5 items and was measured on 5-point Likert scale. Each question was equally weighted. Some examples of the 'perceived benefits of HSPs' questions were "Health Supplement Products are often as effective as prescribed medicines", "Health Supplements Products are less harmful than prescribed medicines", and "Treating myself with Health Supplement Products is more convenient than going to see a doctor".

On the other hand, the 'perceived costs or barriers of HSPs' construct included four concepts. For example, the concept of 'slow and subtle action' was extracted from the emergent theme that "*I don't like to take herbal remedies because they are slow and subtle*"; whereas the concept of 'lack of knowledge on HSPs' was from that "*I know little or nothing about Health Supplement Products.*" These concepts or themes were frequently mentioned as the barriers or costs of Health Supplement Products among

those who had little experience with HSPs in the in-depth interviews. The other two concepts included as the 'perceived costs or barriers of HSPs' were 'no scientific evidence' and 'ineffectiveness of HSPs'. The scale of the 'perceived costs or barriers of HSPs' included 4 items and was measured on 5-point Likert scale. Each question was equally weighted. Two examples of the perceived costs or barriers of HSPs' questions were "Health Supplement Products are too slow and subtle in their action", and "I believe most Health Supplement Products do not work".

External Cues to Action

The 'external cues to action' construct was defined as any external event such as a mass media message, word-of-mouth, or advertising campaign that prompts health-related action. 'External cues to action' has been measured within the Health Belief Model in the study of AIDS reduction behaviour among homosexual men (Aspinwall et al. 1991) and among heterosexual partners (Hingson et al. 1990). Aspinwall et al. included three questions (e.g. "How many of their close friends had AIDS?"), whereas Hingson et al. included five items (e.g. "Do you know anyone with AIDS?", "Have you ever discussed AIDS with a physician?").

However, since the measurements of the external cues to action in those studies were rather specific to AIDS-related behaviours and included a small number of questions, it was regarded as appropriate to develop new scales of the 'external cues to action' in relation to the purchase of an HSP. The questions on the 'external cues to action' included eight categories of different information sources, which might influence, to some extent, the likelihood of a consumer purchasing an HSP.

The 'external cues to action' were operationalised by asking: (1) whether the respondents had obtained advice in relation to HSP from friends, family, doctors, and pharmacists and shop assistants, and (2) whether the respondents' opinion was influenced by various information sources such as TV, radio, newspaper, magazines, books, displays at the retail shops, and the commercial brochures or leaflets. Each question was measured on a five-point Likert scale, and equally weighted. Some examples of the 'external cues to action' questions were: "I have often obtained advice from friends and family about Health Supplement Products"; "My doctors has given me advice about Health Supplement Products"; and "Adverts on TV and radio have influenced my opinion about Health Supplement Products".

Perceived General Health Threats

The 'perceived threat', which is found in the Health Belief Model (Becker 1974a, b), refers to a composite of the 'perceived susceptibility' and the 'perceived severity' of a specific disease or illness. 'Perceived susceptibility' refers to an individual's estimate of his or her chance of acquiring a disease or of suffering the ill-effects of disease, whereas 'perceived severity' refers to an individual's perception of the seriousness of a given disease or of disease in general (Weissfeld et al. 1990, 1987).

The 'Perceived general health threats' construct was used rather than the 'perceived threat' construct in the current study because "Health Supplement Products" is a 'product category' rather than a 'product', therefore the purchase of "Health Supplement Products" is for the improvement of general health rather than for the treatment of a specific illness as in the case of depression where a specific product, such as Saint John's Wort, may be used.

The 'perceived general health threats' construct relates to broader non-specific perceptions of health threats. This construct was operationalised by three variables: (1) general categories of vulnerability to diseases; (2) general categories of worry about illnesses; and (3) an individual's perceptions on current health status in general. The 'perceived general health threats' scale used for the current study was derived and modified from scales of 'general health threats' and 'health status' developed by Jette et al. (1981) and a scale of 'illness threat' by Cockburn et al. (1987).

In contrast to condition-specific measures of 'perceived health threats' (e.g. "How serious would it be if you got a cold?") which are usually used in the Health Belief Model studies, Jette et al. developed general non-specific measures of health threats (e.g. "Whenever you get sick it seems to be very serious") from a factor analysis of 31 health belief items in two independent samples of households. The general non-specific measures of health threats (i.e. 'general health threat') included 5 question items, and the 'health status' scale had 2 question items. Each question was measured using either 4-point or 3-point response options. For example, two questions of the 'general health threat' scale were: (1) "Whenever you get sick it seems to be very serious. Would you say agree, neutral, or disagree?"; and (2) "If you were to do nothing in particular to protect yourself, how likely is it that you will be sick enough to spend 3 days in bed during the next 12 months? Would you say very likely, likely, unlikely, or very unlikely?" The reliability coefficients of the 'perceived general health threats' scale in both samples were 0.72 and 0.77, whereas those of the 'health status' scale were 0.53 and 0.46.

Similarly, Cockburn et al. (1987) developed a 8-item 'illness threat' scale in an attempt to produce a standardised questionnaire which can be used in general practice, where patients have a wide range of different illnesses. The 'illness threat' scale contained 8 items which related to perceived severity of the current condition (4 items), the perceived severity of illness in general (2 items), and perceived susceptibility to illnesses in general (2 items). A 7-point Likert rating scale was used for the question items. The reliability coefficient of the 'illness threat' scale was 0.82.

From a pool of 15 question items (i.e. 5 items of the 'general health threat', 2 items of the 'health status', and 8 items of the 'illness threat'), overlapping and redundant items were eliminated and some questions (e.g. "If you were to do nothing in particular to protect yourself, how likely is it that you will have a heart attack") considered to be not relevant to the current study were deleted based on the judgement of the researcher. Finally, the 'perceived general health threats' scale used for this study consisted of three items. Each question was measured on a five-point response format. The three questions and their response options were: (1) "Compared to other people your age, would you say that you get sick 'much more often', 'more often', 'as often', 'less often', or 'much less often'?" (2) "Compared to other people your age, when you do get sick, would you say that you get sick 'much more sick', 'more sick', 'as sick', 'less sick', or 'much less sick'?" and (3) "At the moment, would you say that your health in general is 'excellent', 'very good', 'good', 'fair', or 'poor'?"

Socio-demographics

This study selected three key socio-demographics, i.e. age, gender, and education, since these had appeared most frequently in the previous Complementary and Alternative

Medicine studies. The three socio-demographic variables were used to first determine whether certain characteristics of these variables are closely related to the consumers' decision-making on the purchase of Health Supplement Products, and secondly to measure the extent to which these variables influence the relationships among the other variables in the proposed conceptual model.

'Age' was asked in an open-ended question (i.e. "Please write your age?"). 'Gender' was measured on a dichotomous scale (i.e. female, male), whereas 'education' was measured on five levels of educational categories. The categories included 'university postgraduate qualification', 'university undergraduate qualification', 'post-school vocational qualification', 'competed highest level of secondary school', and 'did not complete highest level of secondary school'). Although the categories of educational attainment in this study were very similar to those of the census data (Australian Bureau of Statistics Report No. 6227.0 2001), an additional description was added next to each of the educational attainment categories. For example, the phrase of "HSC, VCE, and other Year 12 certificate" was included next to the educational attainment category of the 'completed highest level of secondary school', whereas the phrase of "Trade certificate, TAFE associated diploma" was added next to that of the 'post-school vocational qualification'.

Creating and Refining the Questionnaire

In the design of the questionnaire, several different strategies were used to increase the response rate. First, good quality coloured paper was used for the questionnaire. Second, the researcher attempted to make simple but clear instructions to answer, to keep the questions and the language simple and short, and to limit each question to one

idea or concept (avoid double barrelled questions). Erdos (1974) suggests 6 to 8 pages as the upper limit on topics of average interest to respondents; the final questionnaire used was only 4 pages. Third, the researcher made an effort to organise the pattern of the questions by asking easier questions first to minimise conditioning, by having general questions precede specific ones, by grouping similar questions together, and by placing sensitive questions (e.g. socio- demographic questions) at the end of the questionnaire. Finally, to reduce the influence of acquiescence bias and extremity bias, some scales were negatively worded, and the scales of similar variables (i.e. personality traits) were put together within the same section (e.g. Section B in the questionnaire) of the questionnaire.

Pilot Testing and Revising the Draft Questionnaire

To maximise the reliability and validity of the data collected, two stages of questionnaire pre-testing were employed.

First, two academic researchers in the field of marketing were asked to assess the content and face validity of a battery of scale items, which was adapted from the literature and developed by the researcher. Modifications of the scale items were made based upon the expert panel's recommendations. In this stage, the questionnaire was also assessed to determine whether further refinement is needed.

Second, once the pretesting questionnaire was developed, it was given to a small number of respondents (n = 31) as a trial run to detect any ambiguity or bias in the questions and to iron out fundamental problems in the instructions or administrative procedures. Although a convenience sampling method was used to select respondents

for the pilot test, efforts were made to maximise the heterogeneity of the sample obtained in terms of age, education, gender, and ethnic origin to ensure that elements for the representative of the population of interest should be included in the pretesting. The socio-demographic profile of the pretesting sample is shown in Appendix XI.

During the second stage of the pretesting, the respondents were asked to complete a questionnaire as if they had received it at home, and to complete it in whatever way they would if the interviewer was not there. The researcher watched while respondents filled out the questionnaire, noting any wrong answers, skipped questions, hesitations, confused expressions, or other behaviour that would seem to indicate a problem with understanding. After the completion of the questionnaire by the respondents, a short personal interview (5 to 10 minutes) was conducted to determine whether they believed that the scale measured what it says it does (i.e. face validity of the scales), and whether they had any problems in answering the questionnaire. This 'debriefing' process (Malhotra et al. 1996) also asked questions on wording, sequence, content, form and layout, question difficulty, and instructions of the questionnaire.

Analyses for scale items at the pretesting were confined to calculation of internal consistency reliability of the multi-item scales, the sample size being too small for factor analysis (Comrey 1978). The scores on the scale items from the pretesting were entered into the SPSS™ statistical program to get the score of *Cronbach's* or *Coefficient alpha* (Cronbach 1951) which measures internal consistency reliability among a group of items combined to form a single scale. Because the *coefficient alpha* (hereafter *alpha*) was the average of all possible split-half coefficients resulting from different ways of splitting the scale items, the *alpha* tests were performed on all multi-item

constructs, but not to the one-item constructs (e.g. the purchase experience with HSPs in the past 12 months).

Malhotra et al. (1996) indicate that the *alpha* test is inappropriate where the scale consists of multi-dimensional constructs, as each dimension within a multi-dimensional construct is somewhat independent. Therefore, a separate *alpha* test for each dimension was performed in the cases of the 'health locus of control' and the 'perceived value of HSPs'. Table 5.3 shows the result of the *alpha* tests on the survey instrument from the pretesting.

Table 5.3 Cronbach's Alpha Scores at the Pretesting

No.	Name of Constructs	Alpha (α)
1	Health Locus of Control (HLC)	
1.1	Internal HLC	.50
1.2	Chance HLC	.73
1.3	Powerful Others HLC	.72
2	Openness to Experience	.72
3	Holistic Orientation	.56
4	Scientific Health Orientation	.45
5	Health Value	.54
6	Perceived General Health Threats	.81
7	Perceived Value of HSPs	
7.1	Benefits	.69
7.2	Costs	.26
8	External Cues to Action	.85

In keeping with the recommendations of Nunnally (1978) and Helmstadter (1973), a coefficient of 0.50 was considered an adequate indication of internal consistency for a questionnaire in the early stages of construction. Of the variables tested, the 'perceived costs or barriers' (.26) and the 'scientific health orientation' (.45) showed relatively low *alpha* scores. The *alpha* score of the other six scales were sufficiently high (i.e. the *alpha* was greater than .5), indicating that the scales are reliable to be used for the survey.

Based on the results of the *alpha* tests and the feedback from the pretesting interviews, some minor changes (e.g. the layout of the questionnaire, the instruction contents, and some of the scale item wording) were made to the scales of the questionnaire in order to obtain more reliable results in the mail survey. Description of the modifications to the scale items is shown in Table 5.4.

Table 5.4 Addition, Deletion and Modification of Scale Items after Pilot Testing

Constructs	Scale Items	Changes
PCB[i]	I believe most HSP do not work.	Added
PCB	HSP are too expensive.	Deleted
Internal HLC[ii]	If I take care of myself, I can avoid illness.	Added
Chance HLC	When I am sick, I just have to let nature run its course.	Deleted
Openness[iii]	I am interested in all fields of science.	Deleted
Openness	I find philosophical arguments boring.	Added
Openness	I have little interest in the world of nature.	Wording
Openness	I am not interested in the origins of the universe.	Wording

[i] Perceived Cost or Barriers [ii] Health Locus of Control [iii] Openness to Experience

First, a total of three scale items were added to the questionnaire (i.e. each one item for the 'perceived costs or barriers of HSPs', the 'internal health locus of control', and the 'openness to experience) in order to improve the reliability[19]. Second, three scale items were deleted from each of two constructs (i.e. the 'perceived costs or barriers of HSPs', the 'chance health locus of control', and the 'openness to experience'). The deletion of one scale item from the 'perceived costs or barriers of HSPs' (i.e. "HSPs are too expensive") increased the *alpha* from 0.26 to 0.43. The decision on the deletion of the other two scale items was based on the feedback from the pretesting interview. Third, the positive wording of two scale items was converted to make them negative. This was to prevent the influence of acquiescence bias and extremity bias which might occur in the mail survey. Fourth, the question items in the 'holistic orientation' and the

[19] Litwin (1995) suggests that the addition of a scale item will in general increase the alpha score of the construct.

'scientific health orientation' were mixed with the 'health value' and the sequence of the questions from those three variables was also modified for the purpose of reducing the influence of acquiescence bias and extremity bias. Finally, examples of education categories were added next to each education response category to make them clearer to respondents.

With the grouping of similar items, the final version of the questionnaire (refer Appendix X) was divided into six sections. The sections were titled as 'Your Experience with HSPs' (Section A), 'Your Attitudes towards Health' (Section B), 'Your Personality and Interests' (Section C), 'Your Attitudes towards HSPs' (Section D), and 'Other Information' (Section E).

Table 5.5 shows changes of *Cronbach's alpha* scores tested at the pretesting and after the mail survey.

Table 5.5 Changes of Cronbach's Alpha between Pretesting and Survey

No.	Name of Construct	Pretesting (α)	Survey (α)	+ / -
1	HLC*			
1.1	Internal HLC	.50	.62	+
1.2	Chance HLC	.73	.60	-
1.3	Powerful Others HLC	.72	.69	-
2	Openness to Experience	.72	.69	-
3	Holistic Orientation	.56	.47	-
4	Scientific Health Orientation	.45	.26	-
5	Health Value	.54	.50	-
6	Perceived GHT*	.81	.79	-
7	Perceived Value of HSPs			
7.1	Benefits	.69	.78	+
7.2	Costs or Barriers	.26	.70	+
8	Cues to Action	.85	.84	-

* HLC = Health Locus of Control GHT = General Health Threat

An increase was shown in the *alpha* scores of the 'perceived costs or barriers of HSPs' (i.e. from .26 to .70), the 'internal health locus of control' (i.e. from .50 to .62), and the 'perceived benefits of HSPs' (i.e. from .69 to .78). However, the *alpha* score of the 'holistic orientation' was decreased from .56 to .47. The researcher decided to use this variable in the analysis, since the difference was marginal. There was also a decrease in the alpha score of 'scientific health orientation' (i.e. from .45 to .26). Although it was not clear why the *alpha* score of the 'scientific health orientation' decreased markedly in the survey, it was speculated that either the construct had too small a number of scale items or there might have been an inappropriate operationalisation of that construct, or both. In addition, the *alpha* scores of the rest of six scales were also slightly decreased from those in the pretesting. However, none of these six constructs had an *alpha* score lower than 0.5.

Administration of the Mail Survey

In keeping with suggestion in the research methods literature (Leedy and Ormrod 2001, De Vaus 1995), careful consideration was given to the design of envelope, covering letter, and questionnaire in order to minimise non-sampling errors. Stamped, self-addressed, university envelopes were used to minimise the effort involved in returning the questionnaire. On the label, the phrase of '*or The Current Resident*' was printed next to the name of the mail recipient to reduce the number of unreachable respondent by indicating that anyone at the mail address was eligible for the mail survey.

The covering letter (refer Appendix VIII) using the university's official letterhead was developed to explain the background to the study and to request the participation. The covering letter also contained information about: the incentive for responding; the

inclusion of an identity number on the questionnaire; privacy and confidentiality issues; and the sample selection method, the voluntary nature of the study, and the proposed use of the survey results.

First, a small incentive (i.e. a $3 instant lottery "scratchie") was promised on return of the questionnaire. Some combination of monetary incentives and follow-up reminders are known to be the most consistently effective methods for achieving higher response rates in mail surveys (James and Bolstein 1990, Kanuk and Berenson 1975). However, the purpose of promising this type of incentive was not solely an inducement. It was also compensation for the respondent's time and trouble. Second, the reason for putting an identity number on each questionnaire was explained as specified by the University's Ethics Committee's survey guidelines. The identity number was later used in three ways: (1) to ensure that unnecessary reminders were not sent to those who already responded; (2) to dispatch the "scratchie" as a reward to respondents; and (3) to compare the response rate of each State. Third, the protection of the respondent's privacy and confidentiality was emphasised in the covering sheet.

The first mail out of the survey questionnaire (n = 3,000) was sent on 5th Nov 2001. The addresses of both returned and undelivered questionnaires were checked against the original list from which the sample was drawn. Ten days later, a reminder letter (refer Appendix IX) with another questionnaire was sent to the respondents who had not yet responded (2,566 of the original respondents). The reminder letter in the follow-up was similar in content to the Covering Letter in the first mail-out but placed more emphasis on the importance of completing the survey. The survey cut-off date was set to be 31st

January 2002. The overall duration of the mail survey was therefore about three months from Nov 2001 to Jan 2002.

5.4 Data Analysis

5.4.1 Qualitative Data Analysis

A total of 66 cases in the in-depth interviews were captured and transcribed for analysis. Transcripts were content analysed to identify specific instances of narrative data to fit or illustrate a theme (i.e. a set of conceptually specified analytic categories). Transcripts were also interpreted from a theoretical frame of reference (i.e. the Health Belief Model) as to whether the application of this framework is viable to explain and predict consumer purchase behaviour in relation to Health Supplement Products.

A set of conceptually specified analytic categories were generated from three processes: (1) 'de-contextualise' and 're-contextualise' (Tesch 1990); (2) 'constant comparison' (Glaser and Strauss 1967); (3) recategorisation. A computerised qualitative data analysis tool, NVIVO (Richards and Richards 1998, 1993), was used to facilitate these processes.

First, 'de-contextualise' (or 'open coding') and 're-contextualise' (or 'categorising'), which are the features of interpretational types of analysis have in common (Strauss and Corbin 1990), were used to generate a set of conceptual categories. Specific instances (words, phrase, latent meanings) of the data are used to develop broader or more general descriptive themes to represent the content of the data. The aims of 'de-contextualise' and 're-contextualise' were both to discover and name phenomena, and to develop categories in terms of their properties and dimensions.

Second, the 'constant comparison' method was used in the process of coding. For example, the open codes on every theme in an interview transcript were constantly compared and grouped into conceptual categories. These conceptual categories, in turn, were then related to each other according to the interconnections, patterns and processes, and commonalities and differences. The interviews were checked for their fit with the emerging conceptual categories. If there was a poor fit, a new category was generated. Initial open codes tended to be provisional and were refined or transformed over the period of analysis as new insights were obtained.

Finally, a 'recategorisation' process was employed as the results of the constant comparison process. For example, major categories, in which groups of concepts with similar traits were formulated with abstract labels, were generated and linked to subcategories by reassembling the data. Tesch (1990) points out these categories are not only intellectual tools for organising data segments, but also the relationships among the categories can be postulated in theory-building analysis.

The findings from the analysis of the in-depth interviews were summarised in Appendix VII. The analysis of the interview data confirmed the utility of the Health Belief Model as a theoretical framework for explaining and predicting consumers' decision-making on the purchase of Health Supplement Products. The findings served to help the development of the conceptual model and the formulation of research hypotheses. Finally, the findings also ensured that the same language that consumers use was used in the wording of the survey questionnaire.

5.4.2. Survey Data Analysis

Preparation of the Survey Data for Statistical Analysis

A codebook (refer Appendix XII) was developed not only to make data input and transformation easier but also to prevent mistakes in the statistical analysis. Survey data was prepared for analysis in four stages.

In the first stage, the question items for each variable were re-grouped. In the second stage, the codes of some scales were reversed ('recoding') before summating the score of each question item since some scales had negative responses to avoid the influence of acquiescence bias and extremity bias. For example, for positive statement 'strongly agree', which initially had a score of 1, would get a high score (i.e. a score of 5), whereas for negative statement 'strongly disagree' would get a low score (i.e. a score of 1).

In the third stage, the summated score of the 'perceived barriers of HSPs' was subtracted from that of the 'perceived benefits of HSPs' to arrive at a score of the 'perceived value of HSPs'. The subtraction was based on the method used by Oliver and Berger (1979). Similarly, the summated score of 'chance health locus of control' (CHLC) was subtracted from the summated score of 'internal health locus of control' (IHLC), and the resultant difference score was treated as a measure of perceived control. This follows Wallston's (1989) suggestion that if the MHLC score is used to predict a certain type of health behaviour in 'normal, healthy' individuals, it is better to subtract CHLC from IHLC and to use the difference score in place of the two raw scores since response set bias (i.e. a respondent's tendency to agree or disagree with items regardless of their content) will be cancelled out in the difference score. Wallston

also argues that scoring high on the 'powerful other health locus of control' (PHLC) does not necessarily indicate low perceived control. If a person is acutely or chronically ill, it is quite rational to believe that other people's actions can influence one's health status. For this reason, 'powerful other health locus of control' (PHLC) scores were ignored in the current study since they were regarded as less relevant to the prediction of health behaviour in the healthy adults on whom the current study focused.

In the final stage, the summated scores of all the predictor variables, which had an interval level of measurement, were re-categorised into three groups such as 'high' (coded as 3), 'medium' (coded as 2), and 'low' (coded as 1) for bivariate analysis. The cumulative percentages (33.3% and 66.6%) of the summated scale scores, as suggested by De Vaus (1995), were used as cut-off points for dividing the sample respondents up into three groups (refer to Table 5.6).

Table 5.6 Cut-off Scores Used for the Groupings of Low, Medium, and High

Construct Name	Score Range	Cumulative Percentage	
		33%	66%
Holistic Orientation	7 ~ 25	17	20
Internal Health Locus of Control	-13 ~ 20	3	7
Health Value	5 ~ 20	14	17
Openness to Experience	13 ~ 45	28	33
Scientific Health Orientation	3 ~ 15	8	9
Perceived General Health Threats	3 ~ 15	6	8
Perceived Value of HSPs	-15 ~ 21	1	7
External Cues to Action	8 ~ 40	16	22

For example, in the summated score, if the corresponding score to the cumulative percentage of 33.3 was 6 and a respondent had a score of 5, (s)he would be classified into the 'low' level group. If the corresponding score to the cumulative percentage of 66.6 was 8 and a respondent had a score of 7, (s)he would be classified into the 'medium' level group. Similarly, if a sample had a summated score of 9, (s)he was

classified into the 'high' level group. The cut-off points in each construct for the classification of the respondents are shown in Table 5.6.

The 'propensity to purchase an HSP', which had a six-point response format (i.e. 'extremely likely' to 'extremely unlikely'), was also recoded into a dichotomous variable (likely to purchase/unlikely to purchase). This dichotomous variable was first used for the analysis of the relationships between the predictor variables and the criterion variable in the *chi-square* tests, second in the analysis of *binominal logistic regression*, which required the dichotomous variable as the criterion variable.

Statistics Used for Survey Data Analysis

The SPSS™ (version 9) was used for the statistical analysis of the survey data. First, the internal consistency reliability (*Cronbach's alpha*) tests were performed to the summated scale items both in the pretesting questionnaire and in the survey. The results of the *alpha* tests were shown in Tables 5.3 and 5.5. Second, as descriptive statistics, the *chi-square* tests (Friedman 1972) was used to examine relationships between pairs of variables in the model. Finally, *multiple linear regression* and *binominal logistic regression* were used as the methods of multivariate analysis.

Bivariate Analysis

Chi-square (χ^2) was applied to test whether or not the variables in a contingency table (or cross-tabulation) were independent of each other. As a non-parametric statistical test, *Pearson chi-square* (hereafter, *chi-square* (χ^2)) was used to first examine whether there was any difference between the sample and the population from which it was

drawn. The objective for this *chi-square* test was to determine whether the sample characteristics in the survey matches with the population characteristics in the census (*Goodness-of-fit*). The *chi-square* value was calculated manually, and was compared with the critical value at the corresponding degree of freedom and the set level of significance. In most tests, the level of significance was set at the 0.05 level, i.e. traditionally the 0.05 level is selected for consumer research projects (Mason and Lind 1996a).

The null hypothesis and the alternative hypothesis for the *goodness-of-fit* were expressed as follows:

***H_0*: There is no significant difference between the sample characteristics (e.g. households population, age, gender and education) and the population characteristics (e.g. households population, age, gender and education).**

***H_1*: There is a significant difference between the sample characteristics (e.g. households population, age, gender and education) and the population characteristics (e.g. households population, age, gender and education).**

The *chi-square* test was also used to determine if there was a relationship between two variables. The cross-tabulation (or 'contingency table') produced by SPSS contained the number of cases that falls into each combination of categories. Hypothesis tests were performed by *chi-square* statistic from the contingency tables in order to decide whether or not there were association between two variables.

The null and the alternative hypothesis for those analyses were expressed as follows:

***H_0*: There is no significant association between one variable (e.g. holistic orientation) and the other variable (e.g. propensity to purchase an HSP).**

***H_1*: There is a significant association between one variable (e.g. holistic orientation) and the other variable (e.g. propensity to purchase an HSP).**

Multivariate Analysis

Multiple linear regression and *binominal logistic regression* (hereafter logistic regression) were used to test the research hypotheses and the proposed conceptual model.

Multiple linear regression was used to determine if high scores on a predictor variable (e.g. the 'holistic orientation') predict high scores on the outcome variable (i.e. the 'perceived value of HSPs'). M*ultiple linear regression* analysis was conducted in two stages. In the first stage of the analysis (Stage I), the researcher first looked at the relationship between the perceived value of HSPs and its antecedents (i.e. the personality traits). In the second stage (Stage II), the socio-demographic variables were added to the Model I to see if they moderate the effects of the personality trait variables on the 'perceived value of HSPs'.

Logistic regression rather than *multiple regression* was used to test the relationship between the propensity to purchase an HSP and its predictor variables in the conceptual

model. There were three reasons for using *logistic regression* rather than *multiple regression* in the analysis of this relationship in the current study.

First, the construct 'likelihood of a consumer purchasing an HSP' was defined as the *probability* of whether a consumer would purchase an HSP, and was measured using a single six-point propensity scale. In considering why some people purchase HSPs and others do not, the focus of the current study was on group differences (i.e. purchasers versus non-purchasers), rather than on individual differences (i.e. variation in the degree of HSP purchase propensity). Thus, the main reason for using a propensity scale was not to measure individual differences in the degree of likelihood of purchasing an HSP, but rather to give more response choices to the survey respondents, thereby helping to reduce response errors.

Second, MacCallum et al. (2002), in a review of the literature regarding the practice of dichotomisation of quantitative measures (to create a category variable with two values), indicate that this practice tends to produce negative consequences[20] which are largely due to the arbitrariness of the point of dichotomisation either at median split or at some point on the scale(s) of measurement. However, there are some cases where the dichotomisation of a metric variable can be regarded as appropriate. Such cases include those where distinct groups exist, and where the distribution of respondents is highly skewed (MacCallum et al. 2002). In the current study, there were two distinct groups of individuals on the criterion variable (i.e. those likely to purchase and those unlikely to

[20] Such negative consequences include loss of information about individual differences in psychological attributes, loss of effect size and power, and the occurrence of spurious significant main effects.

purchase)[21]. In addition, the distribution of observations on the criterion variable was not normal but highly skewed, to the extent that there was a large number of observations (i.e. 34.8% of the sample) at the most extreme end of the scale (refer to Table 6.11), thus violating the assumption of normality in the use of *multiple regression.*

Finally, there was a limitation on using *multiple regression* in the analysis of the current study data in which the criterion variable was a single item Likert-type scale. In order to use *multiple regression* a key assumption is that the criterion variable is at least an interval level measure with equal intervals between each unit of measurement. But Garson (2002b), among others, asserts that Likert type scales are best considered as ordinal scales, although their use in *multiple regression* as interval level data is commonplace in contemporary social science. Garson (2002a) argues that Likert scales are ordinal within any given item (i.e. an item), and sets[22] of Likert items are not necessarily ordinal with respect to each other. It was therefore deemed most appropriate to treat the propensity scale used in this study as ordinal rather than interval, a view which mitigated against the use of multiple regression analysis.

Logistic regression analyses were conducted in three stages. In the first stage of *logistic regression* analysis (Stage I), examined were the relationships between the criterion variable (i.e. the likelihood of a consumer purchasing an HSP in the next twelve

[21] MacCallum et al. were concerned about the potential problems associated with dichotomisation when statistical tests are carried out to determine whether there is a significant difference in the mean of the dependent variables for the two groups represented by the dichotomised independent, but in the current study the criterion variable rather than the independent variables was dichotomised.

[22] Once two or more Likert or ordinal items are combined (e.g. by computing a mean) or summated, not only the equal intervals can be achieved from this combination ("average out") (Elmes 2002), but also the number of possible values for the composite variables begins to increase, thus being quite common practice to treat these composite scores as continuous variables (Newsom 2002).

months) and its antecedents (i.e. the 'perceived value of HSPs', the 'perceived general health threats', and the 'external cues to action'). In the next stage (Stage II), socio-demographic variables were included in the logistic regression model to see if they moderate the previously identified relationships between the criterion variable and its antecedents. In the final stage (Stage III), all the personality traits were added to the logistic regression model to see if they have direct effects on the criterion variable.

5.5 Summary

This chapter presented the research design of the current study (Section 5.2), next described the data collection methods (Section 5.3), and then explained the data analysis techniques used (Section 5.4). A cross-sectional and two-phase design was employed for the current study: the in-depth interview as the initial preliminary qualitative research; and the mail survey as the subsequent quantitative study. Sixty-five in-depth interviews were conducted among adult (aged 18 years and above) residents in the Illawarra of N.S.W. The conceptual model and associated research hypotheses derived from the findings of the preliminary qualitative study were tested in the mail survey. The 'target 'population' of the survey was defined as female or male (aged 18 years or above) head of households responsible for purchasing a Health Supplement Product. The survey sampling method was proportional stratified sampling. After two stages of pretesting, the first mail out of the survey questionnaire was sent to 3,000 households on 5th Nov 2001. Statistics used for survey analysis were *chi-square* tests, *multiple linear regression* and *logistic regression*.

Chapter Six
SURVEY FINDINGS I:
DESCRIPTIVE ANALYSIS

6.1 Introduction

The previous chapter discussed the research methods employed in the current study. The purpose of this chapter is to describe the salient characteristics of the sample and the bivariate relationships among the variables in the proposed conceptual model.

This chapter focuses on two main areas. First, this chapter describes the response rate obtained in the survey, the extrapolation estimation method used for testing for non-response bias, and the extent to which the sample represented the population. Second, some of main findings from the initial descriptive analysis of the survey data are presented to provide background information to a consideration of the theoretical model. The findings with respect to the proposed theoretical model, and the research hypotheses derived from it, will be discussed in the next chapter.

6.2 The Sample

The characteristics of the sample obtained in the survey are discussed in terms of the response rate, the non-response biases, and its socio-demographic features compared to those of the population from which it was drawn.

6.2.1 Response Rate

The questionnaire was sent in Nov 2001 and data collection was finished in Feb 2002. Of the 3,000 questionnaires mailed out, 200 were returned as undelivered because of faulty addresses, and 15 cases had missing response items, while a total of 974 questionnaires were returned in a form eligible for the analysis.

Table 6.1 Response Rates for Each State

States	No. questionnaires sent	Returned as undelivered	Eligible responses*	Response rate (%)
NSW	1004	54	332	35.0
VIC	735	41	221	31.8
QLD	556	46	174	34.1
WA	291	18	93	34.1
SA	257	17	91	37.9
TAS	81	5	32	42.1
ACT	49	2	15	31.9
NT	27	2	11	44.0
Anonymous	-	-	5	-
Total	3000	200	974	34.8

* Note: 15 cases were excluded due to the missing response items in the questionnaire.

The overall response rate for this study was 34.8% as shown in Table 6.1. The response rates in each State ranged from a high of 44.0% (NT) to a low of 31.8% (VIC). Note the highest response rates were received from the smallest sub-samples (n = 81 and 27). Although five respondents (0.5% of the total responses) tore off the questionnaire identification numbers (and so they appear as "anonymous" in the table), their responses were included in the statistical analyses, as this action did not eliminate answers to questions.

The overall response rate obtained in this study was regarded as relatively high, given that poorly planned mail surveys on low-interest topics usually achieve only a 10-15%

response rate from a general population (Kumar et al. 1999, Zikmund 1994, Dillon et al. 1994).

6.2.2 Non-response Error Test

The mail survey has been criticised for non-response bias due to its low response rates (De Vaus 1995). Further, Malhotra et al. (1996) state that higher response rates, in general, imply lower rates of non-response biases, yet response rate may not be an adequate indicator of non-response bias, since response rates themselves do not indicate whether the respondents are representative of the original sample. Furthermore, non-respondents can differ from respondents in terms of demographic, psychographic, personality, attitudinal, motivational, and behavioural variables. If persons who respond differ substantially from those who do not, the results do not directly allow one to say how the entire sample would have responded and thus to generalise from the sample to the population (Armstrong and Overton 1982). While the most commonly recommended protection against non-response bias has been the reduction of non-response itself, a more common approach to the non-response problem is to estimate the effects of non-response (Wayne 1975).

To examine the existence of non-response biases, this study used the extrapolation estimation method. The extrapolation method is sometimes used as a way to estimate non-response, and is based on the assumption that subjects who respond less readily are more like those who do not respond at all than those who do respond readily (Kanuk and Berenson 1982). 'Less readily' has been defined as answering later, or as requiring more prodding to answer, and 'readily' as answering sooner, or as requiring less prodding to answer (Armstrong and Overton 1982).

Employing the extrapolation estimation method, the first 100 responses were treated as the early response, whereas the last 100 responses as the late response. In addition, as the first 100 responses arrived before mailing the follow-up letter, these were regarded as the non-stimulated response, and the last 100 responses as the stimulated response. Two groups (i.e. the first and the last 100 responses) were compared in terms of the logistic coefficients of the predictor variables to determine whether the *binominal logistic regression* results differed between the responders and non-responders. In the *binomial logistic regression* analysis, the 'propensity to purchase an HSP in the next twelve months' was used for the measurement of the likelihood of a consumer purchasing an HSP (i.e. criterion variable). To compare *logistic coefficients* in the first 100 responders with those in the last 100 responders, an identical *binominal logistic regression* was performed for both groups. Then, the significance of the differences between each of the corresponding coefficients was tested using the *Wald chi-square*[23].

The computed *Wald chi-square* values are shown in the right column of Table 6.2.

Table 6.2 *Wald Chi-square* Tests between the First and the Last 100 Respondents

	First 100 responders		Last 100 responders		*Wald chi-square*
	Coefficient	S.E.	Coefficient	S.E.	
Perceived value of HSPs	0.23	0.08	0.11	0.08	1.210
External cues to action	0.26	0.09	0.22	0.08	0.098
Perceived general health threats	0.34	0.20	0.32	0.17	0.004
Holistic orientation	-0.15	0.15	0.05	0.13	0.941
Internal health locus of control	0.06	0.10	-0.02	0.10	0.318
Openness to experience	0.00	0.07	0.03	0.06	0.098
Scientific health orientation	0.27	0.27	-0.24	0.21	2.245
Health value	0.14	0.13	0.26	0.14	0.405
Age	0.02	0.02	0.02	0.03	0.016
Men	0.75	0.82	-1.50	0.73	4.198
Not completed secondary school	-1.66	1.40	-0.45	1.21	0.425
Completed secondary school	-2.45	1.28	-0.16	1.47	1.377
Vocational education	-1.86	1.13	0.54	1.14	2.236
University undergraduate	-2.33	1.35	-1.04	1.29	0.479

[23] *Wald chi-square* = $(b1 - b2)^2 / \{[se(b1)]^2 + [se(b2)]^2\}$, where b's are the logistic coefficients for groups 1 and 2 and *se* terms are their corresponding standard errors (Garson 2002c).

All computed *Wald chi-square* values were less than the critical value (6.635, df=1, at α = .01) of the *chi-square*. As none of the computed *Wald chi-square* values in the logistic coefficients was larger than the critical *chi-square* value of 6.635, the null hypothesis of no difference between two sub groups was not rejected. It was therefore concluded that there were no differences between the first and the last one hundred respondents in terms of the logistic coefficients of the variables measured. Thus, non-response bias was regarded as negligible from the results of *Wald chi-quare* tests of the logistic coefficients between the early and the late responders in the mail survey.

6.2.3 Features of the Sample Obtained

The target population for this study was female or male (aged 18 and above) head of households responsible for purchasing Health Supplement Products. To determine how well, in terms of the number of households in each State, the sample represented the target population, *chi-square* (χ^2) *goodness-of-fit* tests were performed. The census data for households in each State (Population by Age and Sex, Australian States and Territories, Australian Bureau of Statistics Report No. 3201.01, 2001) was used as the target population data for the *chi-square goodness-of-fit* test.

Table 6.3 shows the distribution of the number of households in each State between the census and the survey data. The distribution between the census and the survey data appeared to be very similar. Since the computed *chi-square* value (χ2 = 8.3) was less than the critical value (χ^2 = 18.475, at df = 7 and α = .01), it was concluded that there was no statistically significant difference in the distribution of the number of households in each State between the census and the survey data.

Table 6.3 Households Population Difference

State	Census		Survey	
	Expected[i] Frequency	(%)	Observed Frequency	(%)
NSW	328	33.8	332	34.3
VIC	244	25.1	221	22.8
QLD	178	18.4	174	18.0
WA	94	9.7	93	9.6
SA	77	7.9	91	9.4
TAS	24	2.4	32	3.3
ACT	16	1.6	15	1.5
NT	9	0.9	11	1.1
Total	969	100	969[ii]	100

[i] Eligible responses (969) x the proportions of each category in the Census
[ii] 5 anonymously responded questionnaires were excluded
(*Chi-square* = 8.3, *df* = 7)

It can be concluded that in terms of the number of households in each State the sample obtained can be considered to be reasonably representative of the target population from which it was drawn. However, given the response rate of just over one third (34.8%) of those in the original sample and the nature of the sampling frame used, the possibility of biases in the sample obtained cannot be categorically ruled out and this should be born in mind when interpreting the survey findings.

Age, Gender, and Education

The distribution differences in age, gender, and education between the census and the survey data were provided as background data on the sample characteristics in relation to the national population characteristics. It is of worth noting that there was no equal probability of being selected in terms of age, gender, and education in the selection of the sample respondents because they were selected from the list of telephone directories (i.e. residential address listings), and the number of adults in this list might not be equal

in each household. The distribution data with the computed values of the *chi-square goodness-of-fit* test are shown in Tables 6.4 - 6.6.

Table 6.4 shows the distribution of 'age' both in the census and in the survey data. The *chi-square* (χ^2) *goodness-of-fit* test showed there was a statistically significant difference in the distribution of age between the census and the survey data since the computed *chi-square* value ($\chi^2 = 101.68$) was more than the critical value ($\chi^2 = 13.277$, at $df = 5$ and $\alpha = .01$). The proportion of the '18-24' age group (3.5%) in the survey data appeared to be under represented (13.2% in the census data), whereas that of the '65+' age group (21.7%) appeared to be over represented (16.3% in the census data).

Table 6.4 Age Distribution Difference

Age	Census		Survey	
	Expected[i] Frequency	(%)	Observed Frequency	(%)
18-24	128	13.2	34	3.5
25-34	196	20.1	168	17.2
35-44	199	20.4	221	22.7
45-54	174	17.9	196	20.1
55-64	118	12.1	144	14.8
65 +	159	16.3	211	21.7
Total	974	100	974	100

[i] Eligible responses (974) x the proportions of each category in the Census
(*Chi-square* = 101.68, *df* = 5)

Although it was not clear why the '18-24' age group was under represented, it is assumed that many of the households for which telephone numbers are provided are less likely to be listed under the names of this young age group compared to the other age groups. It is also speculated that some proportions of this age group in the population might be college students and residing in college dormitories, therefore they might be

excluded from the coverage, or that those who live with their parents in households were not responsible for purchasing Health Supplement Products.

Table 6.5 shows the distribution of 'gender' (aged 18 and above) both in the census and in the survey data. The χ^2 *goodness-of-fit* test showed there was a statistically significant difference in the distribution of gender between the census and the survey data since the computed *chi-square* value ($\chi^2 = 34.97$) was more than the critical value ($\chi^2 = 6.64$, at $df = 1$ and $\alpha = .01$). The proportion of females appeared to be higher in the survey data (60.5%) than in the census data (50.7%), whereas that of males appeared to be lower in the survey (39.5%) than in the census data (49.3%). Although it was not clear why more women than men had responded in the survey, it is assumed that women are more likely to have a special interest in the topic of Health Supplement Products than men, that women are more responsible for purchasing Health Supplement Products than men, or that, simply, women are more likely than men to respond to surveys in the way that they are more likely to answer home telephones (Groves and Lyberg 1988).

Table 6.5 Gender Distribution Difference

Gender	Census		Survey	
	Expected[i] Frequency	(%)	Observed Frequency	(%)
Female	497	50.7	589	60.5
Male	477	49.3	385	39.5
Total	974	100	974	100

[i] Eligible responses (974) x the proportions of each category in the Census
(Chi-square = 34.97, *df* = 1)

Table 6.6 shows the distribution of 'education' both in the census and the survey data. The *chi-square goodness-of-fit* test showed there was a statistically significant difference in the distribution of education between the census and the survey data since

the computed *chi-square* value (χ^2 = 402.1) was more than the critical value (χ^2 = 13.3, at df = 4 and α = .01). It appeared that the 'university postgraduate qualification' group (9.1%) was over represented and the 'did not complete highest level of secondary school' group (29.8%) was under represented in the survey data compared to the census data (4.4% and 33.8% respectively). It was speculated that the difference in education is because mail survey respondents tend to be better educated than nonrespondents. It is worth noting that this result should be interpreted with caution since it was not achievable, in terms of age composition, to completely match the distribution of education attainment in the census data with that of the survey data. That is, the census data (Australian Bureau of Statistics Report No. 6227.0 2001) on the educational attainment covered people aged between 15 and 64, whereas the survey data included people aged 18 and above.

Table 6.6 Education Distribution Difference

Education	Census		Survey	
	Expected[i] Frequency	(%)	Observed Frequency	(%)
University postgraduate Qualification	53	4.4	89	9.1
University undergraduate qualification	212	17.7	156	16.0
Post school vocational Qualification	100	24.2	285	29.3
Completed highest level of secondary school	202	19.9	154	15.8
Did not complete highest level of secondary school	407	33.8	290	29.8
Total	974	100	974	100

[i] Eligible responses (974) x the proportions of each category in the Census
(*Chi-square* = 402.1, df = 4)

6.3 Key Survey Findings

A wealth of information was collected in the survey. In the following section, I present and discuss some of the main findings from the initial descriptive analysis of the survey data.

6.3.1 The Purchase of Health Supplement Products

Of considerable interest to this study was the incidence of usage of Health Supplement Product (HSP) among the adult Australian population. Accordingly, two questions (i.e. the past experience with HSP and the intention to purchase HSP) were devoted to this in the survey questionnaire. Overall, it was found that nearly three-quarters (72%, n = 699) of those in the sample (n = 974) had purchased one or more HSP(s) in the previous 12 months. As can be seen in Table 6.7, the most commonly purchased category of HSPs was vitamins and minerals, with 86% of those who had purchased any HSP indicating that they had bought these products at least once in the previous 12 months. By contrast, only around a fifth (21%) of the purchasers had bought a homoeopathic remedy.

Table 6.7 Purchase by HSP Category

HSP Category	Number of Respondents purchasing category once or more in past 12 months (%)
Vitamins/minerals	598 (86%)
Herbal remedies	338 (48%)
Homoeopathic remedies	150 (21%)
Other HSP	280 (40%)

Note: The number of those who had purchased any HSP (n = 699).

The purchase of HSP varied significantly with age and gender, but not by education level, as shown in Tables 6.8, 6.9 and 6.10. The survey findings revealed that the purchase of HSP was more likely among those in the middle age groups (i.e. '25 – 34' and '35 – 44' years), but much less likely among those aged 65 years and above (refer Table 6.8). This result was very similar to the findings from other Complementary and Alternative Medicine (CAM) studies (Eisenberg et al. 1998, 1993, Astin 1998, Schar et al. 1994), which had showed the middle age groups as the most frequent users of CAM.

Table 6.8 Purchase of an HSP by Respondent Age Group

Age Group (years)	% had purchased an HSP in past 12 months (n = 974)
18 – 24	73.5
25 – 34	75.6
35 – 44	78.7
45 – 54	69.4
55 – 64	71.5
65+	63.5
Total Sample	71.8

Note: *chi-square* = 14.2, $df = 5, p < .05$

As Table 6.9 shows, women were much more likely to have purchased an HSP (nearly 80% indicated they had done so in the previous 12 months) than men (only 60% of whom had done so).

Table 6.9 Purchase of an HSP by Gender of Respondent

Gender	% had purchased an HSP in past 12 months (n = 974)
Men	59.7
Women	79.6
Total Sample	71.8

Note: *chi-square* = 45.4, $df = 1, p < 0.001$

This finding is consistent with the results of previous CAM studies (Eisenberg et al. 1998, Kristoffersen et al. 1997, MacLennan et al. 1996, Furnham and Kirkcaldy 1996, Lloyd et al. 1993), which showed women were predominant users of CAM. This difference might be due to either the "softness" of CAM techniques which was postulated as one possible reason for the popularity of CAM among women by Chung (1996) or the gender differences in preference for CAM treatment type, e.g. Sharma (1992) indicated that women were more likely to use herbalism and men were favouring massage and osteopathy.

Of particular interest, the purchase of HSP was found to be not significantly associated with education level (the *chi-square test* on the contingency table of education level by purchase revealed no significant relationship between the two variables, indicating that any differences in the table were due to chance alone). For example, 72% of those in the sample with a *university postgraduate qualification* had purchased an HSP, compared with 71% of those who had completed secondary school only (refer Table 6.10).

Table 6.10 Purchase of an HSP by Respondent Education Group

Education Group	% had purchased an HSP in past 12 months (n = 974)
Did not complete highest level of secondary school	69.0
Completed highest level of secondary school	71.4
Post-school vocational qualification	73.3
University undergraduate qualification	74.4
University postgraduate qualification	71.9
Total Sample	71.8

Note: *chi-square* = 1.995, $df = 4$, $p = .737$

As opposed to the conclusions of other commentators (Mikuls et al. 1999, Mitzdorf et al. 1999, Eisenberg et al. 1998, 1993, MacLennan et al. 1996, Vincent et al. 1995,

Downer et al. 1994, Schar et al. 1994, Lerner and Kennedy 1992, Cassileth et al. 1984), the *chi-square* test did not provide support for the contention that a higher level of education was associated with the higher use of CAM.

6.3.2 Intention to Purchase Health Supplement Products

Respondents were also asked to indicate on a 6-point scale the extent to which they were likely to purchase an HSP in the next 12 months (i.e. purchase propensity). The results are shown in Table 6.11.

Table 6.11 Propensity to Purchase an HSP

Propensity to Purchase an HSP	*% Sample (n = 974)*	
Extremely likely	32.8	67.8
Very likely	18.6	
Somewhat likely	16.4	
Somewhat unlikely	10.0	32.3
Very unlikely	10.5	
Extremely unlikely	11.8	
Total	100	100

Overall, more than two-thirds (67.8%) of those in the sample indicated that they were to some extent likely to purchase an HSP in the next 12 months, with nearly a third of all respondents (32.8%) stating they were extremely likely to do so.

As would be expected, there was a very high level of association between past behaviour and propensity to purchase (refer Table 6.12).

Table 6.12 Propensity to Purchase an HSP by Past Experience with HSPs

		Propensity to Purchase an HSP		
		Likely to Purchase (%)*	Unlikely to Purchase (%)*	Total (%)**
Past Experience	Past Purchase	619 (89)	80 (11)	699 (72)
	No Past Purchase	41 (15)	234 (85)	275 (28)
	Total	660 (68)	314 (32)	974 (100)

* % within Past Experience ** % of Total

Note: *chi-square* = 490, $df = 1$, $p < .001$

As shown in the table, 89% of the previous purchasers stated they were likely to purchase an HSP in the next 12 months, which indicates a consistency in their purchasing behaviour. This contrasts with 85% of the non-purchasers who stated that they were unlikely to buy an HSP in the next 12 months.

On the other hand, there was a small number of "switchers" (i.e. previous buyers who said they were unlikely to buy and previous non-buyers who were likely). Although the reasons for the inconsistent behaviour between the past purchase and the propensity to purchase were not primarily sought from the survey, it was speculated that either the "switchers" had felt no positive benefits from their experience with HSPs or they had not had any need for purchasing HSPs in the past but would do when needed.

As with past behaviour, propensity to purchase an HSP varied significantly with age and gender, but not with education level (refer Tables 6.13, 6.14 and 6.15).

As shown in Table 6.13, the 'propensity to purchase an HSP' was more likely among those in the middle age groups (i.e. '35–44' and '55–64' years), but much less likely among those aged '65 years and above' and '18-24' years. This result contrasts with the findings from the past purchase of HSPs by the age groups (see Table 6.8), which showed those in the age groups of '35-44' (78.7%) and '25-34' (75.6%) years were

more frequent purchaser of HSPs, but those in the age group of '65 years and above' (63.5%) were less frequent purchaser of HSPs. However, the most likely group of 'the purchase of HSPs in the past' and the 'propensity to purchase an HSP' was the age group of '35-44' years.

Table 6.13 Propensity to Purchase by Age of Respondent

Age Group	Propensity to Purchase an HSP		
	Likely to Purchase (%)*	Unlikely to Purchase (%)*	Total (%)**
18-24	21 (62)	13 (38)	34 (4)
25-34	114 (68)	54 (32)	168 (17)
35-44	170 (77)	51 (23)	221 (23)
45-54	135 (69)	61 (31)	196 (20)
55-64	101 (70)	43 (30)	144 (15)
65+	119 (56)	92 (44)	211 (22)
Total	660 (68)	314 (32)	974 (100)

* % within Age Group ** % of Total

Note: *chi-square* = 22, *df* = 5, $p < 0.01$

The 'propensity to purchase an HSP' by gender of the respondents is shown in Table 6.14. Women were much more likely to show a propensity to purchase an HSP (nearly 60% indicated they would do so in the next 12 months) than men (only 40% of whom would do so).

Table 6.14 Propensity to Purchase by Gender of Respondent

Gender	Propensity to Purchase an HSP		
	Likely to Purchase (%)*	Unlikely to Purchase (%)*	Total (%)**
Women	447 (76)	142 (24)	589 (60)
Men	213 (55)	172 (45)	386 (40)
Total	660 (68)	314 (32)	974 (100)

* % within Gender ** % of Total

Note: *chi-square* = 45.1, *df* = 1, $p < .001$

The 'propensity to purchase an HSP' by educational level of the respondents is shown in Table 6.15. 66% (192 respondents) of the sample with a '*did not complete highest level of secondary school*' showed 'likely to purchase an HSP'. Similarly, 69% (61 respondents) of the sample with a '*university postgraduate qualification*' showed 'likely to purchase an HSP'. Contrary to the results of the *chi-square* tests in relation to 'age', and 'gender', both of which showed statistically significant differences between the 'propensity to purchase an HSP' and the categories of them, the results of the *chi-square* test in relation to the 'education' did not show any significant difference (p = .688). That is, the 'propensity to purchase an HSP' was found to be not significantly associated with education level.

Table 6.15 Propensity to Purchase by Education of Respondent

Education	Propensity to Purchase an HSP		
	Likely to Purchase (%)*	Unlikely to Purchase (%)*	Total (%)**
Did not complete highest level of secondary school	192 (66)	98 (34)	290 (30)
Completed highest level of secondary school	99 (64)	55 (36)	154 (16)
Post-School vocational qualification	197 (69)	88 (31)	285 (29)
University undergraduate qualification	111 (71)	45 (29)	156 (16)
University postgraduate qualification	61 (69)	28 (32)	89 (9)
Total	660 (68)	314 (32)	974 (100)

* % within Education ** % of Total

Note: *chi-square* = 2.3, *df* = 4, p = .688

6.3.3 Personality Traits Constructs

Data on five personality trait constructs were collected in the survey. In the analyses of the bivariate relationships between the criterion variable and its predictors, the 'propensity to purchase an HSP in the next twelve months' was used for the measurement of the likelihood of a consumer purchasing an HSP. The main descriptive findings on each of these are discussed below.

Holistic Orientation

As discussed in Section 4.4.1, the 'holistic orientation' relates to the degree of a consumer's congruence with holistic views or principles, which emphasise the importance of the connection of body, mind, and spirit, and recognise the body's own power of natural healing (Apostolides 1996, Otto and Knight 1979). In the survey, this was measured using a five-item scale. On the basis of their responses to the scale items, respondents were classified into high, moderate and low 'holistic orientation' categories.

Table 6.16 Holistic Orientation by Propensity to Purchase an HSP

Propensity to Purchase an HSP	Holistic Orientation			
	High	Moderate	Low	Total
Yes (%)*	213 (73)	232 (70)	215 (61)	660 (68)
No (%)*	77 (27)	99 (30)	138 (39)	314 (32)
Total (%)**	290 (30)	331 (34)	353 (36)	974 (100)

* % within Holistic Orientation ** % of Total

Note: *chi-square* = 12.708, $df = 2$, $p < .01$

As shown in Table 6.16, of those in the sample, 36% had a low 'holistic orientation', 34% were moderate, and 30% were high in this orientation (e.g. were more likely to believe that the body has a natural ability to heal itself, and that treatments for illness should focus on the whole person). There was a statistically significant relationship ($p <$

.01) between 'propensity to purchase an HSP' and 'holistic orientation'. Those with a high 'holistic orientation' were more likely to state that they intended to purchase an HSP in the next 12 months (73% of high 'holistic orientation' respondents versus 68% of the total sample), compared with low 'holistic orientation' respondents who were less likely to indicate a propensity to purchase (61% of low 'holistic orientation' respondents versus 68% of the total sample).

As shown in Table 6.17, the 'holistic orientation' was related to educational level at a statistically significant level ($p < .001$). That is, those with a post-school educational qualification were more likely to have a high 'holistic orientation', while those who had only secondary schooling were more likely to have a low orientation. It was speculated that this apparent relationship between education and the holistic orientation might be attributed to the fact that either education may increase the likelihood of widened exposure through their own reading of books on alternative therapies, or a certain level of education may be required for understanding the holistic views or principles. However, the 'holistic orientation' did not vary according to age ($p > .1$) and gender ($p > .05$).

Table 6.17 Holistic Orientation by Education of Respondent

Education[1]	Holistic Orientation			
	High (%)*	Moderate (%)*	Low (%)*	Total (%)**
1	69 (24)	91 (31)	130 (45)	290 (30)
2	32 (21)	61 (40)	61 (40)	154 (16)
3	97 (34)	104 (36)	85 (30)	285 (29)
4	62 (40)	48 (31)	46 (30)	156 (16)
5	30 (34)	28 (32)	31 (35)	89 (9)
Total	290 (30)	331 (34)	353 (36)	974 (100)

* % within Education ** % of Total

1: Did not complete highest level of secondary school 2: Completed highest level of secondary school
3: Post-School vocational qualification 4: University undergraduate qualification
5: University postgraduate qualification Note: *chi-square* = 29.753, $df = 8$, $p < .001$

Internal Health Locus of Control

As discussed in Section 4.4.2, the 'health locus of control' (HLC) is a generalised expectancy that occurs when individuals have learned that outcomes are contingent or non-contingent on their health behaviours, and posits that individuals with "internal" rather than "external" expectancies are more likely to take action to improve their health habits (Lau and Ware 1981, Wallston et al. 1978). The concept of 'health locus of control' posits that a high score on the 'internal health locus of control' indicates a person feels in control of his or her own health (e.g. "I am directly responsible for my health"), whereas a low score indicates a person feels health is due to by chance and beyond his or her own control (e.g. "People who never get sick are just plain lucky").

In the survey, this was measured using a ten-item scale. On the basis of their responses to the scale items, respondents were classified into high, moderate and low 'internal health locus of control' (IHLC) categories (refer Table 6.18).

Table 6.18 Internal Health Locus of Control by Propensity to Purchase an HSP

Propensity to Purchase an HSP	Internal Health Locus of Control			
	High	Moderate	Low	Total
Yes (%)*	236 (73)	172 (67)	252 (64)	660 (68)
No (%)*	88 (27)	83 (33)	143 (36)	314 (32)
Total (%)**	324 (33)	255 (26)	395 (41)	974 (100)

* % within Internal Health Locus of Control ** % of Total

Note: *chi-square* = 6.677, $df = 2$, $p < .05$

Of those in the sample, as shown in Table 6.18, 41% had a low IHLC, 26% were moderate, and 33% were high in the IHLC (e.g. were more likely to believe that the body has a natural ability to heal itself, and that treatments for illness should focus on the whole person). There was a significant relationship ($p < .05$) between the propensity

to purchase an HSP and IHLC. Those with a high IHLC were more likely to state that they intended to purchase an HSP in the next 12 months (73% of high IHLC respondents), compared with low IHLC respondents who were less likely to indicate a propensity to purchase (64% of low IHLC respondents).

On the other hand, there was, as shown in Table 6.19, also a significant relationship between the IHLC and the educational level ($p < .01$). That is, those with a post-school educational qualification were more likely to have a high IHLC, while those who had only secondary schooling were more likely to have a low IHLC (e.g. were more likely to disagree with the propositions that imbalances in a person's life are a main cause of illness and that the health of the body mind and spirit are inter-related). However the IHLC did not vary according to age ($p = .174$) and gender ($p = .54$).

Table 6.19 Internal Health Locus of Control by Education of Respondent

Education[i]	Internal Health Locus of Control			
	High (%)*	Moderate (%)*	Low (%)*	Total (%)**
1	77 (27)	65 (22)	148 (51)	290 (30)
2	52 (34)	41 (27)	61 (40)	154 (16)
3	101 (35)	79 (28)	105 (37)	285 (29)
4	62 (40)	46 (30)	48 (31)	156 (16)
5	32 (36)	24 (27)	33 (37)	89 (9)
Total	324 (33)	255 (26)	395 (41)	974 (100)

* % within Education ** % of Total

1: Did not complete highest level of secondary school 2: Completed highest level of secondary school
3: Post-School vocational qualification 4: University undergraduate qualification
5: University postgraduate qualification Note: *chi-square* = 21.825, *df* = 8, $p < .01$

Health Value

As discussed in Section 4.4.3, the construct 'health value' relates to the importance attached to health by consumers (Lau et al. 1986). In the survey, this was measured using a four-item scale. On the basis of their responses to the scale items, respondents

were classified into high, moderate and low 'health value' categories. Of those in the sample, as shown in Table 6.20, 37% had a low 'health value', 34% were moderate, and 29% were high in 'health value' (e.g. were more likely to give more importance to health than other values).

Table 6.20 Health Value by Age of Respondent

Age Group	Health Value			
	High (%)*	Moderate (%)*	Low (%)*	Total (%)**
18–24	8 (24)	10 (29)	16 (47)	34 (4)
25–34	36 (21)	56 (33)	76 (45)	168 (17)
35–44	50 (23)	78 (35)	93 (42)	221 (23)
45–54	50 (26)	80 (41)	66 (34)	196 (20)
55–64	54 (38)	43 (30)	47 (33)	144 (15)
65+	81 (38)	67 (32)	63 (30)	211 (21)
Total	279 (29)	334 (34)	361 (37)	974 (100)

* % within Age Group ** % of Total

Note: *chi-square* = 31.540, *df* = 10, $p < .001$

The 'health value' was related to age at a statistically significant level ($p < .001$). That is, those in the age groups of '55-64' and '65+' years were more likely to have a high 'health value', while those in the age groups of '18-24' and '25-34' years were more likely to have a low 'health value' (e.g. were less likely to give importance to health). It was speculated that this apparent relationship between high level of 'health value' and older age groups of people might be attributed to the fact that older people have more health problems than younger people.

However, the results of the *chi-square* test showed that the 'health value' did not vary according to gender ($p > .1$), the educational level ($p > .05$) and the 'propensity to purchase an HSP' ($p > .1$). That is, the 'propensity to purchase an HSP', gender and education were found to be not significantly associated with 'health value'.

Openness to Experience

As discussed in Section 4.4.4, McCrae and Costa (1983) define 'openness to experience' as the common core of attitudes such as willingness to try new activities, intellectual curiosity, a flexible approach to social and moral values, awareness and appreciation of emotional responses and artistic sensitivity.

In the survey, this construct was measured using a nine-item scale. On the basis of their responses to the scale items, respondents were classified into high, moderate and low 'openness to experience' categories. Of those in the sample, as shown in Table 6.21, 41% had a low 'openness to experience', 28% were moderate, and 31% were high in the 'openness to experience' (e.g. were more likely to try new activities, have a curiosity and aesthetic values). There was a statistically significant relationship ($p < .001$) between the propensity to purchase an HSP and 'openness to experience' (refer Table 6.21). Those with a high 'openness to experience' were more likely to state that they intended to purchase an HSP in the next 12 months (74% of high 'openness to experience' respondents), compared with low 'openness to experience' respondents who were less likely to indicate a propensity to purchase (61% of low 'openness to experience' respondents).

Table 6.21 Openness to Experience by Propensity to Purchase an HSP

Propensity to Purchase an HSP	Openness to Experience			
	High	Moderate	Low	Total
Yes (%)*	223 (74)	197 (71)	240 (61)	660 (68)
No (%)*	79 (26)	79 (29)	156 (39)	314 (32)
Total (%)**	302 (31)	276 (28)	396 (41)	974 (100)

* % within Openness to Experience ** % of Total

Note: *chi-square* = 16.042, $df = 2$, $p < .001$

As shown in Tables 6.22 and 6.23, the 'openness to experience' was also significantly related to gender ($p < .05$) and educational level ($p < .001$). Women were more likely to have a high 'openness to experience' (33% of women versus 28% of men), while men were more likely to have a low 'openness to experience' (46% of men versus 38% of women).

Table 6.22 Openness to Experience by Gender of Respondent

Gender	Openness to Experience			
	High (%)*	Moderate (%)*	Low (%)*	Total (%)**
Women	196 (33)	172 (29)	221 (38)	589 (60)
Men	106 (28)	104 (27)	175 (46)	385 (40)
Total	302 (31)	276 (28)	396 (41)	974 (100)

* % within Gender ** % of Total

Note: *chi-square* = 6.475, *df* = 2, $p < .05$

In addition, those with a post-school educational qualification were more likely to have a high 'openness to experience', while those who had only secondary schooling were more likely to have a low 'openness to experience' (e.g. were less likely to try new things, have aesthetic values). However, the 'openness to experience' did not vary according to age ($p > .1$).

Table 6.23 Openness to Experience by Education of Respondent

Education[i]	Openness to Experience			
	High (%)*	Moderate (%)*	Low (%)*	Total (%)**
1	46 (16)	85 (29)	159 (55)	290 (30)
2	38 (25)	43 (28)	73 (47)	154 (16)
3	105 (37)	80 (28)	100 (35)	285 (29)
4	67 (43)	42 (27)	47 (30)	156 (16)
5	46 (52)	26 (29)	17 (19)	89 (9)
Total	302 (31)	276 (28)	396 (41)	974 (100)

* % within Education ** % of Total

1: Did not complete highest level of secondary school 2: Completed highest level of secondary school
3: Post-School vocational qualification 4: University undergraduate qualification
5: University postgraduate qualification Note: *chi-square* = 78.916, *df* = 8, $p < .001$

Scientific Health Orientation

As discussed in Section 4.4.5, the 'scientific health orientation' relates to a perception that science is important, and that science is important to health-care improvement (Plank and Gould 1990, Gould and Plank 1987). Hence, people with a high 'scientific health orientation' would use scientific reports to make health-related decisions, believing that science was relevant to helping them make those decisions (Plank and Gould 1990). In the survey, this was measured using a three-item scale. On the basis of their responses to the scale items, respondents were classified into high, moderate and low 'scientific health orientation' categories.

As shown in Table 6.24, of those in the sample, 36% had a low 'scientific health orientation', 42% were moderate, and 22% were high in this orientation. The 'scientific health orientation' was related to 'age' in a statistically significant level ($p < .001$) and to 'education' in a significant level ($p < .01$) (refer Table 6.24 and 6.25). For example, as shown in Table 6.24, the percentage of high 'scientific health orientation' respondents within each age group showed increasing trend along with the increase in the age.

Table 6.24 Scientific Health Orientation by Age of Respondent

Age Group	Scientific Health Orientation			
	High (%)*	Moderate (%)*	Low (%)*	Total (%)**
18–24	4 (12)	18 (53)	12 (35)	34 (4)
25–34	22 (13)	68 (41)	78 (46)	168 (17)
35–44	38 (17)	100 (45)	83 (38)	221 (23)
45–54	41 (21)	91 (46)	64 (33)	196 (20)
55–64	32 (22)	58 (40)	54 (38)	144 (15)
65+	74 (35)	77 (37)	60 (28)	211 (21)
Total	211 (22)	412 (42)	351 (36)	974 (100)

* % within Age Group ** % of Total

Note: *chi-square* = 40.228. *df* = 10. $p < .001$

In addition, those with a post-school educational qualification were, as shown in Table 6.25, more likely to have a high 'scientific health orientation', while those who had only secondary schooling were more likely to have a low orientation (e.g. were more likely to disagree with the propositions that imbalances in a person's life are a main cause of illness and that the health of the body mind and spirit are inter-related).

Table 6.25 Scientific Health Orientation by Education of Respondent

Education[1]	Scientific Health Orientation			
	High (%)*	Moderate (%)*	Low (%)*	Total (%)**
1	59 (20)	110 (38)	121 (42)	290 (30)
2	24 (16)	69 (45)	61 (40)	154 (16)
3	58 (20)	119 (42)	108 (38)	285 (29)
4	40 (26)	77 (49)	39 (25)	156 (16)
5	30 (34)	37 (42)	22 (25)	89 (9)
Total	211 (22)	412 (42)	351 (36)	974 (100)

* % within Education ** % of Total

1: Did not complete highest level of secondary school 2: Completed highest level of secondary school
3: Post-School vocational qualification 4: University undergraduate qualification
5: University postgraduate qualification Note: *chi-square* = 25.450, $df = 8, p < .01$

On the other hand, the result of the *chi-square* test showed that there was an insignificant (p = .054) relationship between 'scientific health orientation' and the propensity to purchase an HSP. The 'scientific health orientation' did not vary according to gender ($p > .05$).

6.3.4 Elements of the Health Belief Model

Data on the elements of the Health Belief Model were collected in the survey. In the analyses of the bivariate relationships between the criterion variable and its antecedents, the 'propensity to purchase an HSP in the next twelve months' was used for the measurement of the likelihood of a consumer purchasing an HSP. The main descriptive findings on each of these are discussed below.

Perceived Value of Health Supplement Products

As discussed in Section 4.4.6, the 'perceived value of HSPs' construct was defined as a consumer's cost-benefit analysis in relation to the purchase of Health Supplement Products. The 'perceived value of HSPs' construct was measured by a subtraction of the index score of 'perceived barriers or costs of HSPs' variable from that of 'perceived benefits of HSPs' variable.

In the survey, this was measured using a nine-item scale. On the basis of their responses to the scale items, respondents were classified into high, moderate and low 'perceived value of HSPs' categories. Of those in the sample, as shown in Table 6.26, 39% had a low 'perceived value of HSPs', 32% were moderate, and 29% were high in the 'perceived value of HSPs'.

There was a significant relationship between the propensity to purchase an HSP and 'perceived value of HSPs'. Those with a high 'perceived value of HSPs' were more likely to state that they intended to purchase an HSP in the next 12 months (93% of high 'perceived value of HSPs' respondents), compared with low 'perceived value of HSPs' respondents who were less likely to indicate a propensity to purchase (39% of low

'perceived value of HSPs' respondents). That is, the 'propensity to purchase an HSP' was found to be associated with 'perceived value of HSPs' at a statistically significant level ($p < .001$) as would be expected (i.e. are more likely to buy it if it is seen to be of overall benefit).

Table 6.26 Perceived Value of HSPs by Propensity to Purchase an HSP

Propensity to Purchase an HSP	Perceived Value of HSPs			
	High	Moderate	Low	Total
Yes (%)*	262 (93)	249 (80)	149 (39)	660 (68)
No (%)*	20 (7)	64 (20)	230 (61)	314 (32)
Total (%)**	282 (29)	313 (32)	379 (39)	974 (100)

* % within Perceived Value of HSPs ** % of Total
Note: *chi-square* = 241.951, $df = 2$, $p < .001$

The 'perceived value of HSPs' was also related to age ($p < .001$) and gender ($p < .001$) in a statistically significant level (refer Tables 6.27, and 6.28). For example, as shown in Table 6.27, those in the age groups of '25-34' and '35-44' years were more likely to have a high 'perceived value of HSPs', while those in the other age groups were more likely to have a low 'perceived value of HSPs'.

Table 6.27 Perceived Value of HSPs by Age of Respondent

Age Group	Perceived Value of HSPs			
	High (%)*	Moderate (%)*	Low (%)*	Total (%)**
18–24	10 (29)	10 (29)	14 (41)	34 (4)
25–34	55 (33)	63 (38)	50 (30)	168 (17)
35–44	74 (34)	74 (34)	73 (33)	221 (23)
45–54	58 (30)	64 (33)	74 (38)	196 (20)
55–64	39 (27)	55 (38)	50 (35)	144 (15)
65+	46 (22)	47 (22)	118 (56)	211 (21)
Total	282 (29)	313 (32)	379 (39)	974 (100)

* % within Age Group ** % of Total
Note: *chi-square* = 38.118, $df = 10$, $p < .001$

In addition, as shown in Table 6.28, women were more likely to have a high 'perceived value of HSPs' (35% of women versus 20% of men), while men were more likely to have a low 'perceived value of HSPs' (50% of men versus 32% of women). However, the 'perceived value of HSPs' did not vary according to the educational level ($p > .05$).

Table 6.28 Perceived Value of HSPs by Gender of Respondent

Gender	Perceived Value of HSPs			
	High (%)*	Moderate (%)*	Low (%)*	Total (%)**
Women	205 (35)	198 (34)	186 (32)	589 (60)
Men	77 (20)	115 (30)	193 (50)	385 (40)
Total	282 (29)	313 (32)	379 (39)	974 (100)

* % within Gender ** % of Total

Note: *chi-square* = 39.232, $df = 2$, $p < .001$

External Cues to Action

As discussed in Section 4.4.7, the 'external cues to action' relates to an external event such as a mass media message, word-of-mouth, or advertising campaign that prompts health-related action. There has been some evidence that the decision to use Complementary and Alternative Medicines was attributed to the influence of significant others (Breuner et al. 1998, Astin 1998, Kristoffersen et al. 1997). In the survey, this construct was measured using an eight-item scale. On the basis of their responses to the scale items, respondents were classified into high, moderate and low 'external cues to action' categories.

As shown in Table 6.29, of those in the sample, 38% had a low 'external cues to action', 32% were moderate, and 30% were high in the 'external cues to action'. There was a statistically significant ($p < .001$) relationship between the propensity to purchase an HSP and 'external cues to action'. Those with a high 'external cues to action' were more likely to state that they intended to purchase an HSP in the next 12 months (89%

of high 'external cues to action' respondents), compared with low 'external cues to action' respondents who were less likely to indicate a propensity to purchase (41% 'external cues to action' respondents).

Table 6.29 External Cues to Action by Propensity to Purchase an HSP

Propensity to Purchase an HSP	External Cues to Action			
	High	Moderate	Low	Total
Yes (%)*	257 (89)	251 (80)	152 (41)	660 (68)
No (%)*	32 (11)	63 (20)	219 (59)	314 (32)
Total (%)**	289 (30)	314 (32)	371 (38)	974 (100)

* % within External Cues to Action ** % of Total
Note: *chi-square* = 202.472, *df* = 2, $p < .001$

The 'external cues to action' was also related to age ($p < .001$) and gender ($p < .001$) in a statistically significant level (refer Tables 6.30 and 6.31). For example, as shown in the Table 6.30, the younger age groups tended to have a high 'external cues to action', while the older age groups tended to have a low 'external cues to action'.

Table 6.30 External Cues to Action by Age of Respondent

Age Group	External Cues to Action			
	High (%)*	Moderate (%)*	Low (%)*	Total (%)**
18–24	13 (38)	13 (38)	8 (24)	34 (4)
25–34	63 (38)	58 (35)	47 (28)	168 (17)
35–44	73 (33)	77 (35)	71 (32)	221 (23)
45–54	61 (31)	66 (34)	69 (35)	196 (20)
55–64	35 (24)	51 (35)	58 (40)	144 (15)
65+	44 (21)	49 (23)	118 (56)	211 (22)
Total	289 (30)	314 (32)	371 (38)	974 (100)

* % within Age Group ** % of Total
Note: *chi-square* = 45.926, *df* = 10, $p < .001$

In addition, as shown in Table 6.31, women were more likely to have a high 'external cues to action' (35% of women versus 21% of men), while men were more likely to have a low 'external cues to action' (50% of men versus 30% of women). However, the 'external cues to action' did not vary according to educational level ($p > .05$).

Table 6.31 External Cues to Action by Gender of Respondent

Gender	External Cues to Action			
	High (%)*	Moderate (%)*	Low (%)*	Total (%)**
Women	208 (35)	204 (35)	177 (30)	589 (60)
Men	81 (21)	110 (29)	194 (50)	385 (40)
Total	289 (30)	314 (32)	371 (38)	974 (100)

* % within Gender ** % of Total

Note: *chi-square* = 43.929, $df = 2, p < .001$

Perceived General Health Threats

As discussed in Section 4.4.8, the 'perceived general health threats' construct relates to broader non-specific perceptions of health threats. This construct was operationalised by three variables: (1) general categories of vulnerability to diseases; (2) general categories of worry about illnesses; and (3) an individual's perceptions on current health status in general. In the survey, this was measured using a three-item scale. On the basis of their responses to the scale items, respondents were classified into high, moderate and low 'perceived general health threats' categories.

Table 6.32 Perceived General Health Threats by Propensity to Purchase an HSP

Propensity to Purchase an HSP	Perceived General Health Threats			
	High	Moderate	Low	Total
Yes (%)*	157 (73)	233 (72)	270 (62)	660 (68)
No (%)*	57 (27)	93 (29)	164 (38)	314 (32)
Total (%)**	214 (22)	326 (34)	434 (45)	974 (100)

* % within Perceived General Health Threats ** % of Total

Note: *chi-square* = 11.249, $df = 2, p < .01$

Of those in the sample, as shown in Table 6.32, 45% had a low 'perceived general health threats', 34% were moderate, and 22% were high in 'perceived general health threats'. There was a statistically significant ($p < .01$) relationship between the propensity to purchase an HSP and the perceived general health threats. Those with a high 'perceived general health threats' were more likely to state that they intended to

purchase an HSP in the next 12 months (73% of high 'perceived general health threats' respondents), compared with low 'perceived general health threats' respondents who were less likely to indicate a propensity to purchase (62% of low 'perceived general health threats' respondents.

The 'perceived general health threats' was also significantly related to age ($p < .05$) and educational level ($p < .05$) (refer Tables 6.33 and 6.34). However, the 'perceived general health threats' did not vary according to gender ($p > .1$).

That is, those in the age group of '18-24' years, as shown in Table 6.33, were more likely to have a high 'perceived general health threats', whereas those in the other age groups were more likely to have a low 'perceived general health threats'.

Table 6.33 Perceived General Health Threats by Age of Respondent

Age Group	Perceived General Health Threats			
	High (%)*	Moderate (%)*	Low (%)*	Total (%)**
18–24	14 (41)	12 (35)	8 (24)	34 (4)
25–34	49 (29)	57 (34)	62 (37)	168 (17)
35–44	44 (20)	78 (35)	99 (45)	221 (23)
45–54	40 (20)	66 (34)	90 (46)	196 (20)
55–64	25 (17)	47 (33)	72 (50)	144 (15)
65+	42 (20)	66 (31)	103 (48)	211 (21)
Total	214 (22)	326 (34)	434 (45)	974 (100)

* % within Age Group ** % of Total

Note: *chi-square* = 20.196, *df* = 10, $p < .05$

Although it was not clear from the survey data why those in the younger age groups (i.e. 18-24, 25-34, and 35-44 years) showed a relatively high perception of general health threats, it is speculated that these younger people tend to be more socially active, to have a greater exposure to various environmental health threats (e.g. work, family duties), and to be more informed about health-related issues, and thus see themselves as more susceptible to disease and poor health.

In addition, those in the education group of 'did not complete highest level of secondary school', as shown in Table 6.34, were more likely to have a high 'perceived general health threats', whereas those in the other education groups were more likely to have a low 'perceived general health threats'.

Table 6.34 Perceived General Health Threats by Education of Respondent

Education[i]	Perceived General Health Threats			
	High (%)*	Moderate (%)*	Low (%)*	Total (%)**
1	75 (26)	110 (38)	105 (36)	290 (30)
2	38 (25)	49 (32)	67 (44)	154 (16)
3	50 (18)	91 (32)	144 (51)	285 (29)
4	37 (24)	42 (27)	77 (49)	156 (16)
5	14 (16)	34 (38)	41 (46)	89 (9)
Total	214 (22)	326 (34)	434 (45)	974 (100)

* % within Education ** % of Total

1: Did not complete highest level of secondary school 2: Completed highest level of secondary school
3: Post-School vocational qualification 4: University undergraduate qualification
5: University postgraduate qualification Note: *chi-square* = 19.201, $df = 8, p < .05$

6.4 Summary

This chapter reviewed the sample characteristics and descriptive analysis of the survey data. The overall response rate for the survey was 34.8% and this was regarded as being relatively high compared to the response rates of mail surveys for a general population. Non-response error was regarded as negligible in the current mail survey. As there was no statistically significant difference in the distribution of households in the States of the Commonwealth between the survey and the census data, it could be concluded that the sample was reasonably representative of the households in the States.

Descriptive analyses of the survey data showed that 72% of those in the sample had purchased one or more HSP(s) in the previous twelve months. Vitamins/Minerals was the most commonly purchased category of HSP, followed by herbal remedies. The 'past

purchase experience of HSP' varied significantly with 'age' and 'gender', but not with 'educational level'.

About 68% of those in the sample indicated that they were to some extent likely to purchase an HSP in the next twelve months. As would be expected, there was a very high level of association between the past purchase experience with HSP and the propensity to purchase an HSP. The propensity to purchase an HSP varied significantly with 'age' and 'gender', but not with 'educational level'.

Table 6.35 shows a summary of the *chi-square* independence statistic results explaining the bivariate relationships among three socio-demographics, five personality traits, the 'propensity to purchase an HSP', the 'perceived value of HSPs', the 'perceived general health threats', and the 'external cues action'.

Table 6.35 Summary Table of *Chi-square* Tests

Variable	Significance (p)			
	PP-HSP[i]	Age	Gender	Education
Propensity to purchase an HSP	*n/a*[ii]	.000***	.000***	.296
Holistic orientation	.002**	.169	.083	.000***
Openness to experience	.000***	.625	.039*	.000***
Internal health locus of control	.035*	.174	.540	.005**
Scientific health orientation	.054	.000***	.067	.001**
Health value	.360	.000***	.128	.070
Perceived value of HSPs	.000***	.000***	.000***	.098
Perceived general health threats	.004**	.027*	.535	.014*
External cues to action	.000***	.000***	.000***	.079

[i] PP-HSP: Propensity to Purchase an HSP *** $p < .001$ ** $p < .01$ * $p < .0$

[ii] *n/a*: Not Available

'Holistic orientation', 'openness to experience', and 'internal health locus of control' were significantly associated with the 'propensity to purchase an HSP', whereas 'scientific health orientation', and 'health value' were not significantly associated with

the 'propensity to purchase an HSP'. While 'age' was proven to be significantly associated with the 'scientific health orientation' and the 'health value', 'gender' was shown to have a statistically significant relationship only with the 'openness to experience'. 'Education' was significantly associated with all of the four personality traits except for the 'health value'.

The 'perceived value of HSPs' and the 'external cues to action' were significantly associated with the 'propensity to purchase an HSP', 'age', and 'gender', but not by 'educational level'. The 'perceived general health threats' was significantly associated with the 'propensity to purchase an HSP', 'age', and 'educational level', but not by 'gender'.

However, it is worth noting that the findings from these *chi-square* tests should be used as background information for the next chapter, which discusses the theoretical model, since the *chi-square* test only relates to the bivariate relationships, but does not consider any confounding effects or mediating effects of other variables in the model which may be detected in the multivariate analysis.

Multivariate analyses, notably *multiple linear regression* and *logistic regression*, will be discussed in the following chapter which describes the results from the testing of the research hypotheses derived from the proposed conceptual model.

Chapter Seven
SURVEY FINDINGS II:
TESTING THE THEORETICAL MODEL

7.1 Introduction

The previous chapter presented the descriptive analysis of the survey. The response rates and the test for non-response error were discussed, and the bivariate relationships among the variables in the proposed conceptual model were also examined in the previous chapter.

The first two sections of this chapter present the results of the multivariate analyses used to test the research hypotheses within the proposed conceptual model. *Multiple linear regression* analyses (Section 7.2) were used to test the research hypotheses 1-6, which describe the relationships between the personality traits and the perceived value of Health Supplement Products, whereas *binominal logistic regression* analyses (Section 7.3) were used to test the research hypotheses 7-10, which explain the relationships between the likelihood of a consumer purchasing Health Supplement Products, its antecedent variables and the socio-demographic variables. Section 7.4 summarises the results of the hypothesis tests from the multivariate analyses and compares these with the results from the bivariate analyses described in Chapter 6. This chapter concludes with a justification of the proposed conceptual model, specifically focusing on the mediating role of the 'perceived value of Health Supplement Products' within the proposed conceptual model.

7.2 Multiple Linear Regression

7.2.1 Introduction

Section 7.2.2 describes the two stages of *multiple linear regression* (hereafter *multiple regression*) analysis in terms of the reason for using this method of analysis, the variables involved in the analyses, and the regression methods used. Section 7.2.3 describes the preliminary analyses of the underlying assumptions required for *multiple regression*. Section 7.2.4 discusses the analysis of 'outliers' in the survey data to determine whether they had any influence on the regression model. Finally, the results of the *multiple regression* analyses in two stages are explained in Section 7.2.5.

7.2.2 The Stages of Multiple Regression Analysis

Multiple regression analysis is a multivariate statistical technique used to examine the relationship between an outcome variable and several predictors (Hair et al. 1998). M*ultiple regression* analysis was used in this study to predict the relative contribution of the personality traits (the predictor variables) to the outcome variable of the 'perceived value of Health Supplement Products (HSPs)', and to explain the influence of each variable in making a prediction on the outcome variable simultaneously. Hair et al. (1998) state that *multiple regression* analysis provides a means of objectively assessing the magnitude and direction of each predictor's relationship with its outcome variable.

Two stages of *multiple regression* analysis were performed as illustrated in Figure 7.1. In Stage I, only the personality traits were considered to test their relationship with the 'perceived value of HSPs'.

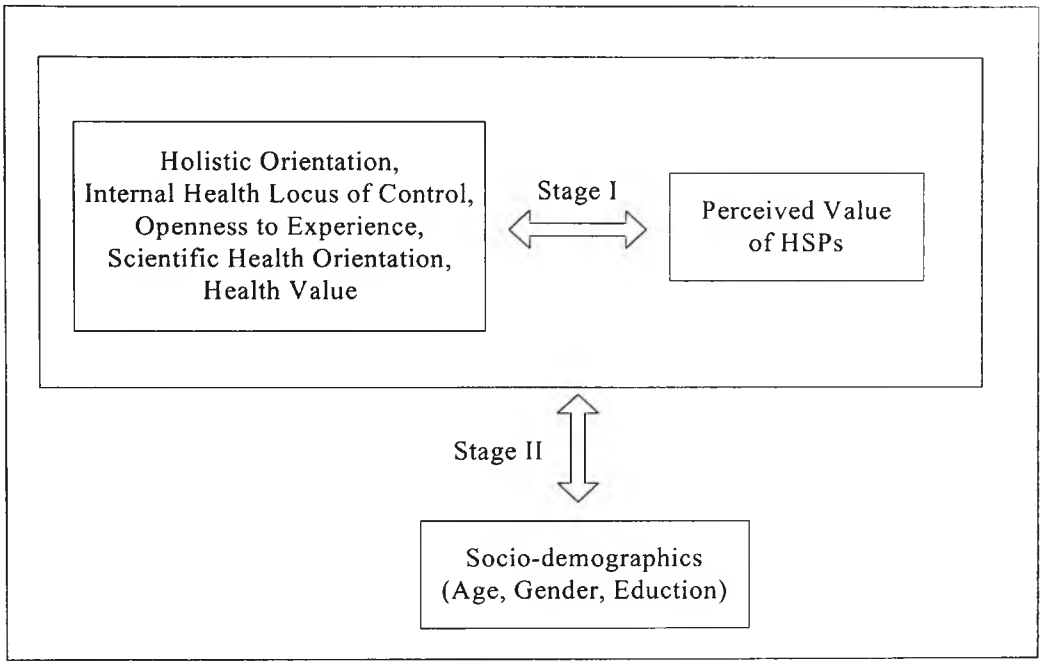


Figure 7.1 Two Stages of Multiple Regression Analysis

In Stage II, the socio-demographic variables were added to the first stage of the *multiple regression* model to see if any of the socio-demographic variables moderated the relationship between the personality traits and the perceived value of HSPs.

While the *forced entry* regression method was used in Stage I, the *hierarchical* (*blockwise entry*) regression method was used in Stage II. The reason for selecting the *forced entry* regression method was that this method is considered most appropriate for theory testing (Studenmund and Cassidy 1987), whereas '*stepwise*' regression is more appropriate in the exploratory phase of research or for purposes of prediction (Menard 1995). In Stage II, new predictors (i.e. the socio-demographic variables) were added as the second 'block' in the regression analysis to see if the addition of this new block had an influence on the relationship between the personality traits and the perceived value of HSPs.

7.2.3 Testing the Underlying Assumptions for Multiple Regression

To draw conclusions about a population based on a regression analysis conducted on sample data, Hair et al. (1998) and Berry (1993) emphasise the importance of testing to identify any violations of the underlying assumptions in *multiple regression* analysis. The assumptions of 'linearity' and 'homoscedasticity', 'normality of residuals', 'multicollinearity', and 'residual independence' in *multiple regression* were therefore tested.

Linearity and Homoscedasticity

Linearity assumes that the relationship between dependent and independent variables should be a linear one, whereas *homoscedasticity* means that the residuals at each level of the independent variables should have the same variance (Hair et al. 1998). A plot of ZRESID (standardised differences between the observed data and the values that the regression model predicts) against ZPRED (standardised predicted values of the dependent variable based on the regression model) was used to determine whether the assumptions of the random errors and homoscedasticity have been met (refer Figure 7.2).

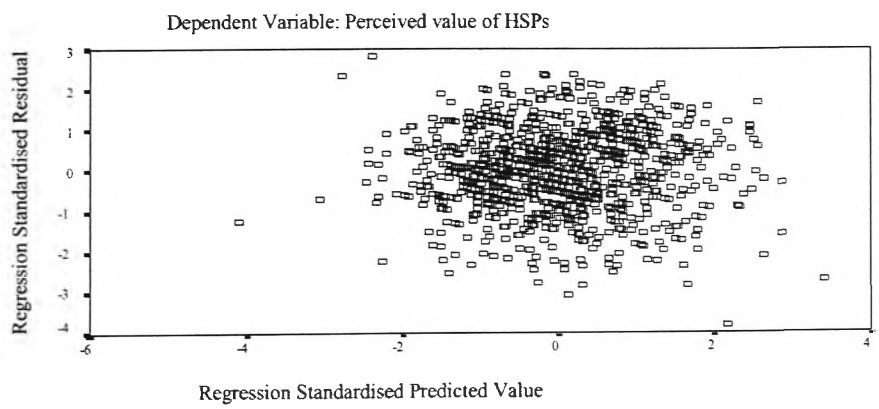


Figure 7.2 Scatterplot of ZRESID against ZPRED

When the points are randomly and evenly dispersed throughout the scatterplot, as shown in Figure 7.2, this pattern is indicative of a situation in which the assumptions of linearity and homoscedasticity have been met (Hair et al. 1998). It was therefore concluded that the assumptions of 'linearity' and 'homoscedasticity' in the multiple regression model were met.

In addition, a set of partial regression plots was also used to detect whether there were any non-linear relationships and heteroscedasticity in the multiple regression model. Partial regression plots are scatterplots of the residuals of the dependent variable (i.e. the perceived value of HSPs) and each of the independent variables (i.e. personality trait variables) when both variables are regressed separately on the remaining independent variables (Hair et al. 1998). For all five independent variables, neither curvilinear pattern nor a funnel shape was shown, thus meeting the assumptions of 'linearity' and 'homoscedasticity' for each variable. The partial regression plots for 'holistic orientation', 'internal health locus of control', 'openness to experience', 'scientific health orientation', and 'health value' are shown in Figures 7.3 – 7.7.

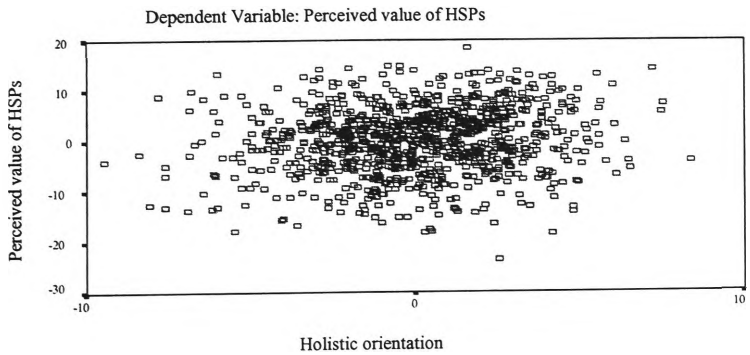


Figure 7.3 Partial Regression Plot: Holistic Orientation

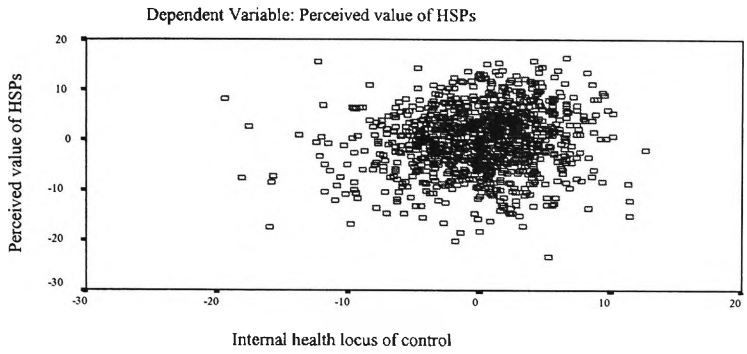


Figure 7.4 Partial Regression Plot: Internal Health Locus of Control

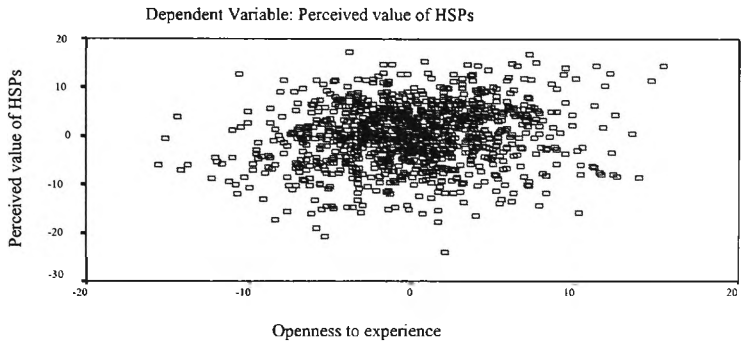


Figure 7.5 Partial Regression Plot: Openness to Experience

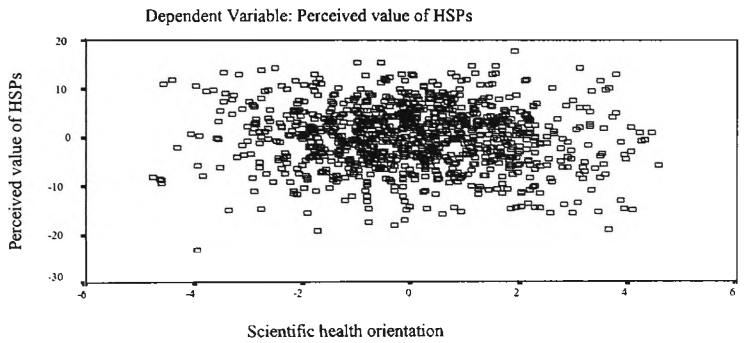


Figure 7.6 Partial Regression Plot: Scientific Health Orientation

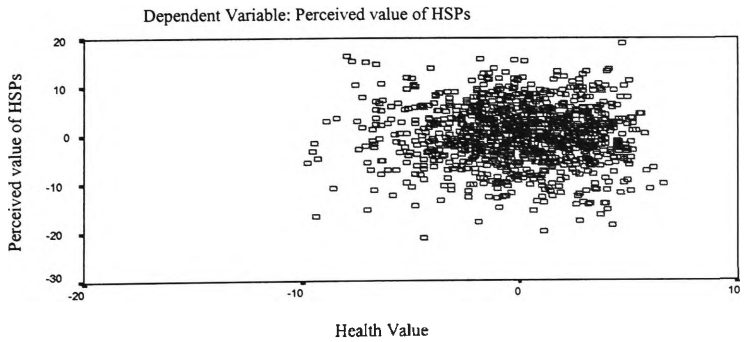


Figure 7.7 Partial Regression Plot: Health Value

Normality

Normality refers to degree to which the distribution of the sample data corresponds to a normal distribution (Hair et al. 1998). This was diagnosed via a histogram of 'regression standardised residuals' and normal probability plot of 'regression standardised residuals'. Not only did the histogram of 'regression standardised residuals' (Figure 7.8) look like a normal distribution, but the normal probability plot of 'regression standardised residuals' (Figure 7.9) also showed that almost all points lie on a straight line, indicating a normal distribution of the set of weighted independent variables (i.e. the regression variate).

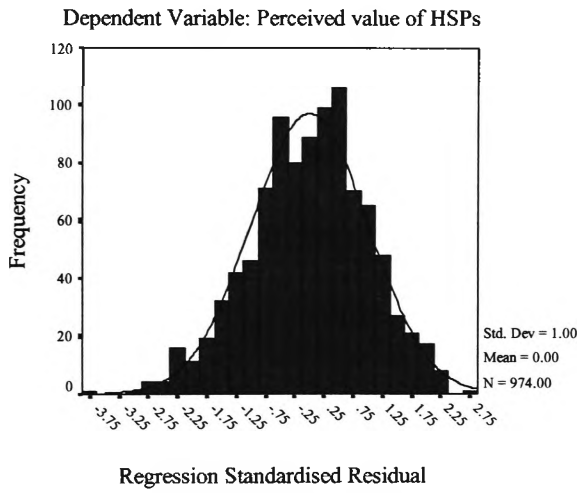


Figure 7.8 Histogram of Regression Standardised Residuals

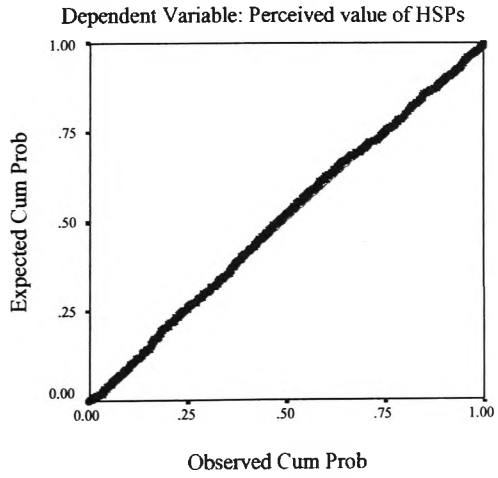


Figure 7.9 Normal P-P Plot of Regression Standardised Residuals

Multicollinearity

Multicollinearity, defined as a strong correlation among three or more predictor variables (Hair et al. 1998), was measured among the personality traits. The presence of multicollinearity threatens the internal validity of *multiple regression* analysis and increases the likelihood of Type II errors in hypothesis testing (Field 2000, Hair et al. 1998).

To identify whether there were any multicollinearity among the five personality trait variables, a correlation matrix of all of the personality traits was scanned to see if any pair of personality traits had a correlation above 0.80 (Licht 1997).

Table 7.1 Partial Correlation Matrix of the Personality Traits

Predictor Variable	Holistic orientation	Internal health locus of control	Openness to experience	Scientific health orientation	Health value
Holistic orientation	1				
Internal health locus of control	.368*	1			
Openness to experience	.375*	.257*	1		
Scientific health orientation	.087*	.028	.220*	1	
Health value	.172*	.192*	.109*	.109*	1

* $p < .001$, one-tailed, $n = 974$

Table 7.1 shows the value of *Pearson*'s partial correlation coefficient (R) for each pair of personality trait variables controlling for age, gender and education. The highest correlation was found between 'holistic orientation' and 'openness to experience' ($R = 0.375$, $p < .001$), whereas the second highest correlation was found between 'holistic orientation' and 'internal health locus of control' ($R = 0.368$, $p < .001$). However, no correlation coefficient exceeded 0.4, thus indicating a lack of multicollinearity.

Table 7.2 Collinearity Statistics

Predictor Variable	Collinearity Statistics	
	Tolerance	VIF
Holistic orientation	.76	1.32
Internal health locus of control	.82	1.22
Openness to experience	.78	1.29
Scientific health orientation	.93	1.08
Health value	.95	1.05

The diagnostics of 'tolerance' and the 'variance inflation factor' (VIF)[24] were also used to test the multicollinearity of the predictor variables. A tolerance below 0.1 or a VIF greater than 10 is considered to indicate a serious problem (Hair et al. 1998, Menard 1995, Myers 1990, Bowerman and O'Connell 1990), so these values were set as the cut-off thresholds.

Table 7.2 shows that none of the independent variables exceeded the cut-off thresholds of 'tolerance' and 'VIF'. This confirmed that collinearity among the predictors of the 'perceived value of HSPs' was not a problem for the *multiple regression* analysis in the current study.

Independence of Residuals

The *Durbin-Watson statistic* was used to test whether the assumption of residual independence was acceptable. The *Durbin-Watson statistic*, which tests whether adjacent residuals are correlated (Field 2000), had a value of 2.02 (see the bottom row in Table 7.5 in Section 7.2.5) indicating that the residuals were uncorrelated.[25] Therefore it was concluded that the assumption of independence of the residuals was met.

[24] VIF = the reciprocal of 'tolerance'
[25] The closer to 2 that the value of Durbin-Watson statistic is, the better (Field 2000).

In summary, the preliminary analyses of 'linearity' and 'homoscedasticity', 'normality of residuals', 'multicollinearity', and 'residual independence' showed that the underlying assumptions of *multiple regression* analysis were satisfied in the current study.

7.2.4 Outlier Analysis

The 'outlier' analysis was carried out to see if any observations lay outside the general patterns of the data and to see if any such outliers influenced the regression results.

From the analysis of standardised residuals (refer Casewise Diagnostics in Appendix XIII), a total of 48 cases (4.9% of the sample cases) were shown to have standardised residuals outside of ± 2. In addition, only three cases (0.3%) had a standardised residual outside of ± 3. These results suggested that the sample appeared to conform to what the researcher would expect for a reasonably accurate model given that in an ordinary sample it is expected that 95% of cases would have standardised residuals within ± 2, and 99% of cases would have standardised residuals within ± 3.

Cook's Distance and *Centered Leverage Values* statistics were used to test the influence of the outliers on the regression model. As none of the cases which had standardised residuals outside of ± 2, had a *Cook's Distance* greater than 1[26], it was concluded that none of them had an undue influence on the *multiple regression* analysis. Similarly, as *Centered Leverage Values* of all cases were very close to 0[27], it was also concluded that

[26] The cut-off threshold value was set as 1 (Hair et al. 1998, Field 2000).
[27] Leverage values can lie between 0 (indicating that the case has no influence whatsoever) and 1 (indicating that the case has complete influence over prediction) (Field 2000).

the cases had no influence on the model as a whole. The results of *Cook's Distance* and *Centered Leverage Values* analysis are included in Appendix XIV.

In summary, since the proportion of outliers in the sample was so small, as shown by the standardised residuals analysis, and the analyses of *Cook's Distance* and *Centered Leverage Values* revealed that some of these outliers might be valid cases that the model should attempt to predict, all outliers were retained in the *multiple regression* analyses.

7.2.5 Multiple Regression Analysis

Two stages of *multiple regression* analysis were performed. The first stage of regression analysis included only the personality traits as the predictors, whereas in the second stage socio-demographic variables were added to the first stage of the regression model to see if these variables moderated the relationships between the personality traits and the perceived value of HSPs.

Stage I

Table 7.3 shows the unstandardised and standardised regression coefficients, R, R^2, and *Adjusted* R^2 of each predictor in the *multiple regression* analysis.

The unstandardised coefficients (B) indicate the individual contribution of each predictor to the regression model. 'Holistic orientation', 'internal health locus of control', and 'openness to experience' had positive coefficients indicating positive relationships, whereas 'scientific health orientation' and 'health value' showed a negative relationship with the 'perceived value of HSPs.

Table 7.3 Multiple Regression: Stage I

Predictors	Unstandardised Coefficient		Standardised Coefficient (beta)	*t*
	B	Std. Error		
Holistic orientation	.30	.08	.138	3.97*
Internal health locus of control	.20	.05	.145	4.34*
Openness to experience	.22	.04	.177	5.14*
Scientific health orientation	-.28	.12	-.072	-2.29**
Health value	-.10	.07	-.047	-1.53
R	.338			
R^2	.114			
Adjusted R^2	.110			

* $p < .001$ ** $p < .05$

Standardised coefficient (beta) values indicate the number of standard deviations that the outcome will change as a result of one standard deviation change in the predictor, and so give a better insight into the relative contribution (or the importance) of a predictor in the model (Field 2000). For example, with its largest standardised coefficient and *t-statistic* values, 'openness to experience' (beta = .177, t = 5.14) was the best predictor of the 'perceived value of HSPs'. The standardised coefficient values for 'holistic orientation' (beta = .138, t = 3.97) and 'internal health locus of control' (beta = .145, t = 4.34) were virtually identical indicating that both variables had a comparable degree of importance in the regression model. On the other hand, the low values of the standardised coefficient and *t-statistic* of 'scientific health orientation' (beta = -.072, t = -2.29) and 'health value' (beta = -.047, t = -1.53) indicated that these variables were relatively less important predictors in the regression model.

In the column labelled *R* were the values of the multiple correlation coefficients between the personality traits and the perceived value of HSPs. The difference between the R^2 and the *adjusted* R^2 (.114 - .110 = .004) suggested that if the model was derived

from the population rather than from a sample it would account for approximately 0.4% less variance in the outcome.

Holistic Orientation

When the effects of 'internal health locus of control', 'openness to experience', 'scientific health orientation', and 'health value' were controlled, the positive regression coefficient (B = .30, t = 3.97, p < .001) of 'holistic orientation' indicated that as the score of this variable increases by one, the score of the 'perceived value of HSPs' increases by .30. On the basis of this finding (i.e. positive regression coefficient and significant at .001 level), it may be concluded that Hypothesis 1 (i.e. consumers with a higher level of 'holistic orientation' tend to have a higher 'perceived value of HSPs') was supported.

Internal Health Locus of Control

When the effects of 'holistic orientation', 'openness to experience', 'scientific health orientation', and 'health value' were controlled, the positive regression coefficient (B = .2, t = 4.34, p < .001) of 'internal health locus of control' indicated that as the score of this variable increases by one, the score of the 'perceived value of HSPs' increases by .2. On the basis of this finding (i.e. positive regression coefficient and significant at .001 level), it may be concluded that Hypothesis 2 (i.e. consumers with a higher level of 'internal health locus of control' tend to have a higher 'perceived value of HSPs') was supported.

Openness to Experience

When the effects of 'holistic orientation', 'internal health locus of control', 'scientific health orientation', and 'health value' were controlled, the positive *regression* coefficient (B = .22, $t = 5.14$, $p < .001$) of 'openness to experience' indicated that as the score of this variable increases by one, the score of the 'perceived value of HSPs' increases by .22. On the basis of this finding (i.e. positive regression coefficient and significant at .001 level), it may be concluded that Hypothesis 5 (i.e. consumers with a higher level of 'openness to experience' tend to have a higher 'perceived value of HSPs') was supported.

Scientific Health Orientation

When the effects of 'holistic orientation', 'internal health locus of control', 'openness to experience', and 'health value' were controlled, the negative *multiple regression* coefficient (B = -.28, $t = -2.29$, $p < .05$) of 'scientific health orientation' indicated that as the score of this variable increases by one, the score of the 'perceived value of HSPs' decrease by .28. On the basis of this finding (i.e. negative regression coefficient and significant at .05 level), it may be concluded that Hypothesis 6 (i.e. consumers with a higher level of 'scientific health orientation' tend to have a lower 'perceived value of HSPs') was supported.

Health Value

When the effects of 'holistic orientation', 'internal health locus of control', 'openness to experience', and 'scientific health orientation' were controlled, the negative *multiple regression* coefficient (B = -.1, t = -1.53, $p > .05$) of 'health value' indicated that as the score of this variable increases by one, the summated score of the 'perceived value of HSPs' decreases by .1. However, the *t-statistic* indicated that the coefficient score was not significant. On the basis of this finding, it may be concluded that Hypothesis 3 (i.e. consumers with a higher level of 'health value' tend to have a higher 'perceived value of HSPs') was not supported.

To measure the moderating effect of 'health value' on the relationship between 'internal health locus of control' and 'perceived value of HSPs' (i.e. Hypothesis 4), a compound variable[28] was created by multiplying the 'internal health locus of control' score by the 'health value' score, and this compound variable was then entered into the regression analysis.

In Table 7.4, Model 1 shows the results of the *multiple regression* analysis which included five personality traits as predictors, whereas Model 2 shows the results of the *multiple regression* analysis which included the compound variable (i.e. 'internal health locus of control' x 'health value') along with five personality traits.

[28] A moderator effect can be represented by a compound variable formed by multiplying an independent variable by another independent variable (Hair et al. 1998).

Table 7.4 Moderator Effect of the Compound Variable of Internal Health Locus of Control & Health Value

Model	R	R^2	*Adj.* R^2	*SSE*	R^2 change	*F* change	df_1	df_2	*Sig. F* change
1	.338	.114	.110	6.4	.114	25.02	5	968	.000
2	.339	.115	.109	6.4	.001	.51	1	967	.478

Hair et al. (1998) state that whether or not the moderator effect is significant can be determined by assessing the change in R^2 before and after the addition of a compound variable into the regression model. It is assumed that if the incremental effect of R^2 is statistically significant, then a significant moderator effect is present.

For Model 2, the incremental change in R^2 after the addition of the compound variable showed a marginal and statistically insignificant increase from .114 to .115 ($F = .51$, $p > .05$), indicating that the addition of the compound variable did not improve the prediction of the 'perceived value of HSPs'. It was therefore concluded that Hypothesis 4 (i.e. consumers with a higher level of 'internal health locus of control' tend to have a higher 'perceived value of HSPs' when they have a higher level of 'health value') was not supported.

Stage II

In Stage II of the analysis, the socio-demographic variables were added to the regression model to see if these variables were correlated with the 'perceived value of HSPs'. Table 7.5 shows the results of the regression analyses of Stage I and II.

For Stage II, the value of R^2 change (.152 - .114 = .038) indicated that the inclusion of the socio-demographic variables accounted for an additional 3.8% of the variance in the

'perceived value of HSPs' and this change gave a rise to an F-ratio of 14.45, which was highly significant ($df_1 = 3$, $df_2 = 965$, $p < .001$). Although the socio-demographic variables together made a significant contribution to the variance in the 'perceived value of HSPs', education did not show any significant contribution but only age (B = -.05, $p < .001$) and gender (B = 1.75, $p < .001$) did.

Table 7.5 Comparison of Multiple Regression Analyses of Stage I and II

Predictors	Stage I			Stage II		
	B[i]	(SE B)[ii]	Beta[iii]	B[i]	(SE B)[ii]	Beta[iii]
Holistic orientation	.30***	(.08)	.14	.25**	(.07)	.12
Internal health locus of control	.20***	(.05)	.15	.21***	(.05)	.15
Openness to experience	.22***	(.04)	.18	.22***	(.04)	.18
Scientific health orientation	-.28*	(.12)	-.07	-.14	(.12)	-.04
Health value	-.10	(.07)	-.05	-.06	(.07)	-.03
Age				-.05***	(.01)	-.12
Gender				1.75***	(.44)	.13
Education				-.32	(.17)	-.06
R^2	.114			.152		
Adjusted R^2	.110			.145		
R^2 change	.114			.038		
F change	25.02*** ($df_1 = 5$, $df_2 = 968$)			14.45*** ($df_1 = 3$, $df_2 = 965$)		
Durbin-Watson	2.02					

[i] B = Unstandardised Coefficient
[ii] (SE B) = Standard Error of Coefficient B
[iii] Beta = Standardised Coefficient
*** $p < .001$ ** $p < .01$ * $p < .05$

Although there were minor changes in the unstandardised coefficients of the personality traits between Stage I and II, the significance levels remained unchanged except for that for 'scientific health orientation'. With the inclusion of the socio-demographic variables into the model (Stage II), the regression coefficient of 'scientific health orientation', which previously had been significant (B = -.28, $p < .001$), was decreased and became insignificant (B = -.14, $p > .05$), suggesting that the negative association between 'scientific health orientation' and the 'perceived value of HSPs' was influenced by socio-demographic variables.

7.2.6 Summary

Assumptions for *multiple regression* analysis were met, and the influence of the few outliers was minimal. Two stages of *multiple regression* analysis were conducted.

Multiple regression analysis in Stage I indicated that 'holistic orientation', 'internal health locus of control', and 'openness to experience' showed statistically significant positive associations with the 'perceived value of HSPs', whereas 'scientific health orientation' showed a statistically significant negative association with the 'perceived value of HSPs'. However, neither did 'health value' show a statistically significant association with the 'perceived value of HSPs', nor the moderator effect of 'health value' on the relationship between 'internal health locus of control' and 'perceived value of HSPs' was present.

Multiple regression analysis in Stage II showed that the inclusion of the socio-demographic variables to the regression model increased the variance in the 'perceived value of HSPs'. However, the regression coefficient of 'scientific health orientation', which previously had been significant in Stage I, was decreased and became insignificant, indicating that the negative association between 'scientific health orientation' and 'perceived value of HSPs' was influenced by the socio-demographic variables. 'Age' and 'gender' showed a significant association with the 'perceived value of HSPs', whereas 'education' did not.

7.3 Binominal Logistic Regression

7.3.1 Introduction

Section 7.2 explained the findings from *multiple regression* analyses used to examine the relationships between the perceived value of HSPs and its antecedent variables (i.e. the personality traits) and to identify any additional effects of the socio-demographic variables on these relationships.

Section 7.3.2 describes the purposes of *binominal logistic regression* (hereafter *logistic regression*) analyses, the variables involved in the analysis, and the regression methods used. Each stage of *logistic regression* is explained in Section 7.3.3, Section 7.3.4, and Section 7.3.5 respectively.

7.3.2 Purposes, Stages, and Methods of Logistic Regression

Logistic regression analysis was used to: (1) test the proposed research hypotheses (H7-H9) explaining the relationships between the likelihood of a consumer purchasing an HSP and its antecedent variables (i.e. the 'perceived general health threats', the perceived value of HSPs', and the 'external cues to action'); (2) test the additional effects of the socio-demographic variables (H10a, H10b, and H10c) on the conceptual model's predictability; (3) test whether the personality trait variables have a direct effect on the likelihood of a consumer purchasing an HSP; and (4) identify the strongest predictors of the likelihood of a consumer purchasing an HSP. Another reason for using *logistic regression* analysis in preference to discriminant function analysis was because less restrictive assumptions are required in *logistic regression* (Polit 1996). Like

multiple regression analysis, the *logistic regression* analysis was tested using SPSS (version 9).

Three stages of *logistic regression* analysis were performed. Figure 7.10 shows the three stages of analysis and the variables involved in each stage. In the analyses of the multivariate relationships between the criterion variable and its predictors, the 'propensity to purchase an HSP in the next twelve months' was used for the measurement of the likelihood of a consumer purchasing an HSP. Each stage of *logistic regression* analysis was labelled as Model I, II, and III respectively.

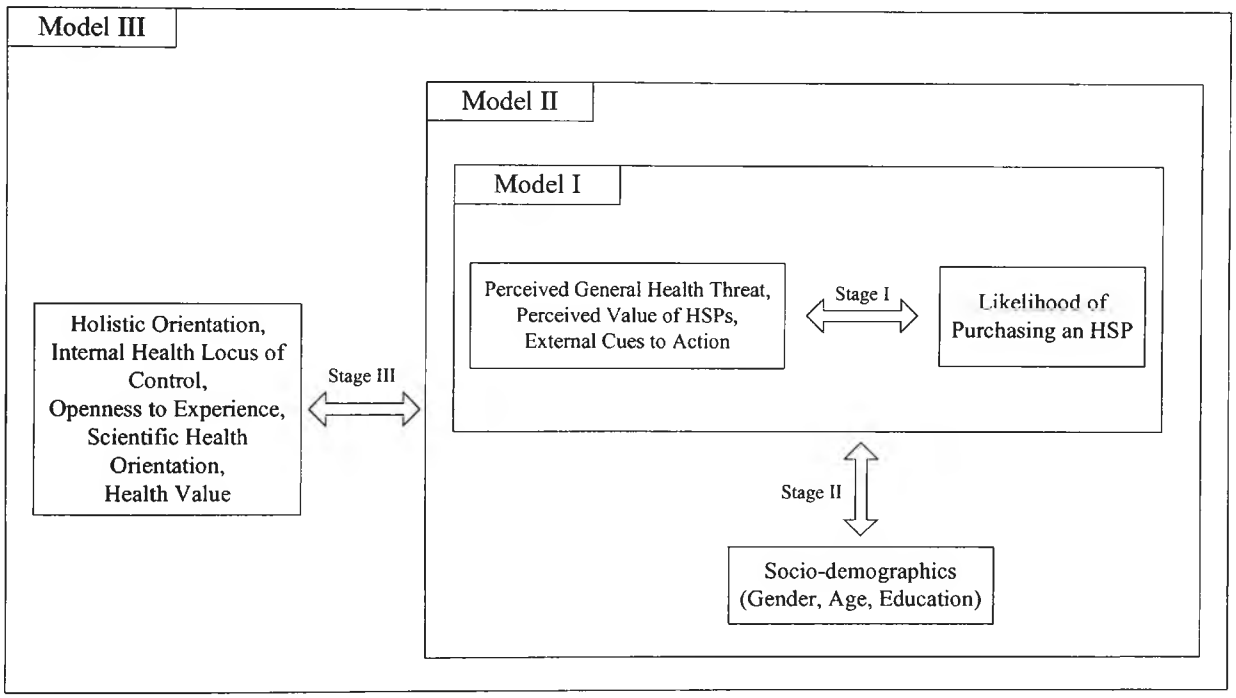


Figure 7.10 Three Stages of Logistic Regression Analysis

Within each stage (or Model) of analysis, the '*forced entry*' regression method was selected, as Studenmund and Cassidy (1987) suggest that this method is considered most appropriate for theory testing, whereas '*stepwise*' regression is more appropriate in the exploratory phase of research or for purposes of prediction.

Menrad (1995, page 54) has noted:

"There appears to be general agreement that the use of computer-controlled stepwise procedures to select variables is inappropriate for theory testing because it capitalizes on random variations in the data and produces results that tend to be idiosyncratic and difficult to replicate in any sample other than sample in which they were originally obtained".

Groups of variables were added hierarchically as a 'block' between each stage of the *logistic regression*. For example, in the second stage of the *logistic regression* analysis, the socio-demographic variables (i.e. the second 'block') were added to a group of three variables: 'perceived value of HSPs', 'external cues to action', and 'perceived general health threats'. Finally, the personality traits (i.e. the third 'block') were added to the Logistic Regression Model II. The purposes of the hierarchical entry regression method were, firstly, to identify whether the added groups of variables influenced the conceptual model's predictability and, secondly, to test whether these variables had a direct effect on the criterion variable, the likelihood of a consumer purchasing an HSP.

7.3.3 Logistic Regression Analysis: Stage I

The first stage of *logistic regression* analysis (Model I) tested the relationships between the likelihood of a consumer purchasing an HSP and its antecedent variables (i.e. 'perceived general health threats', 'perceived value of HSPs', and 'external cues to action'). The highlighted box in Figure 7.11 shows the first stage of *logistic regression* analysis and the variables involved in that analysis.

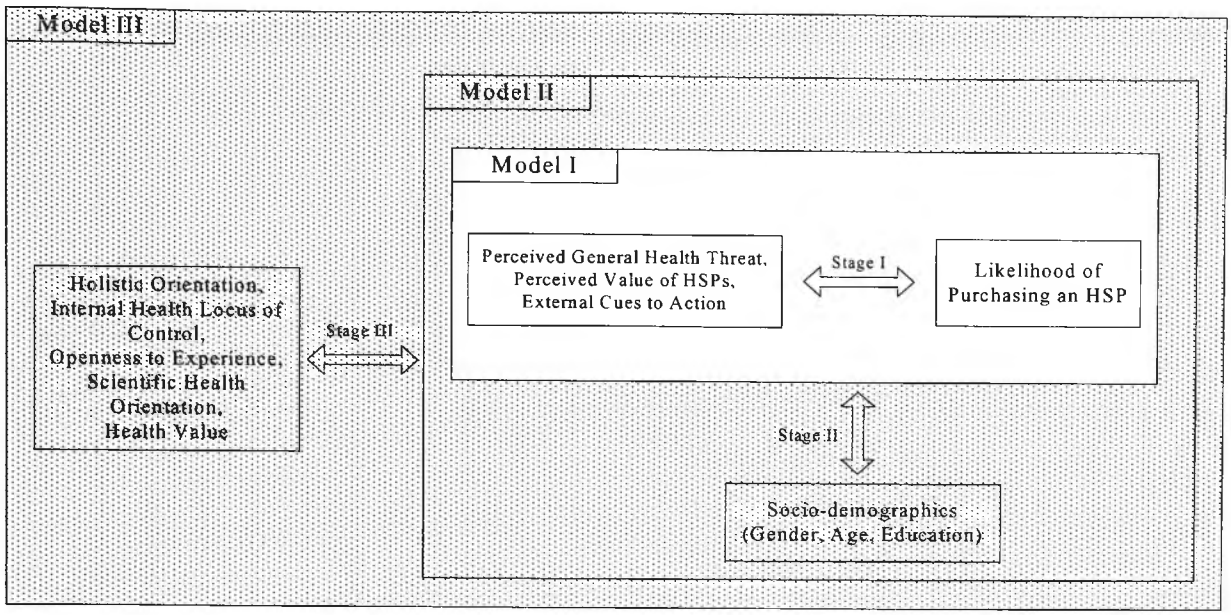


Figure 7.11 Logistic Regression Analysis: Stage I

The first two statistics crucial to the interpretation of the *logistic regression* in Stage I were *-2 Log Likelihood* (hereafter, *-2 LL*) and *Hosmer and Lemeshow Goodness-of-Fit Test*. *-2 LL* is an indicator of how much unexplained portion of the 'likelihood of a consumer purchasing an HSP' there is after the logistic regression model has been fitted. The larger the value of the *–2 LL*, the more unexplained observations there are. The score change of *-2 LL* between the beginning block (i.e. where none of the predictor variables was entered into the *logistic regression* analysis) and the first block (i.e. where all the predictor variables were forced into the *logistic regression* analysis) are shown in Table 7.6.

In Table 7.6, it can be seen that the addition of 'perceived value of HSPs', 'external cues to action', and 'perceived general health threats' into the *logistic regression* model (Model I) reduced the score of *–2 LL* from 1224.614 to 835.718. The *chi-square* value of 388.896, which corresponds to the difference between these two *–2LL* scores, was statistically significant ($df = 3$, $p < .001$), thus indicating that the model including the three predictors was significantly better than without those predictors. That is, the three

predictors together predicted the criterion variable (i.e. the likelihood of a consumer purchasing an HSP) more accurately.

Table 7.6 *–2 LL* Change: Stage I

Block	Variable	*-2 Log Likelihood*	*Chi-square*	*df*	*p*
0	Constant	1224.614			
1	Perceived Value of HSPs External Cues to Action Perceived General Health Threats	835.718	388.896	3	.000

Hosmer and Lemeshow Goodness-of-Fit' test, which divides subjects into deciles based on predicted probabilities and then computes a *chi-square* (Field 2000), was insignificant (*chi-square* = 5.194, *df* = 8, *p* = .737). This result indicated that the null hypothesis (i.e. There is no difference between the observed and predicted values in each group from the logistic model) was not rejected. Thus, it is concluded that the *logistic regression* model was a good fit.

The next part of the statistics included the estimates for the variables (e.g. *logistic coefficients*, *Wald* statistics) in the *logistic regression* equation for the three predictors included in the model (Stage I). The results of the *logistic regression* analyses are shown in Table 7.7.

Table 7.7 shows that the likelihood of a consumer purchasing an HSP was positively associated with 'perceived value of HSPs' (*Coefficient* = .17), 'external cues to action' (*Coefficient* = .13), and 'perceived general health threats' (*Coefficient* = .14). The *partial correlation*, which indicates the relative importance of the predictor variables to the criterion variable, showed that 'perceived value of HSPs' (.2722) and 'external cues to action' (.2275) were greater than 'perceived general health threats' (.0892).

Table 7.7 Multivariate Associations of 'Likelihood of Purchasing an HSP': Stage I

Predictor Variables	*Logistic Coefficient*	*Wald*	*Df*	*p*	*Partial Correlation*	*Odds Ratio*
Perceived Value of HSPs	.17	92.74	1	.0000	.2722	1.18
External Cues to Action	.13	65.36	1	.0000	.2275	1.14
Perceived General Health Threats	.14	11.75	1	.0006	.0892	1.15

The *logistic coefficients* and *Wald* statistics with its significance tests from the table were used to test the Hypotheses 7, 8, and 9. Hypothesis H7 (i.e. consumers with a higher level of 'perceived value of HSPs' tend to have a higher 'likelihood of purchasing an HSP') was supported, as indicated by positive coefficients ($Wald = 92.74$, $df = 1$, $p < .05$). That is, controlling for the other two variables, 'perceived value of HSPs' increased the probability of 'purchasing an HSP' by a factor of 1.18.

Similarly, Hypothesis 8 (i.e. consumers with a higher level of 'external cues to action' tend to have a higher 'likelihood of purchasing an HSP') was also supported, as indicated by positive coefficient ($Wald = 65.36$, $df = 1$, $p < .05$). Every one unit increase in the level of 'external cues to action' increased the probability of 'purchasing an HSP' by a factor of 1.14 when the other variables were controlled.

Although the *logistic coefficient* of 'perceived general health threats' was statistically significant, there was a need to conduct a separate *logistic regression* analysis to detect whether a negative quadratic (i.e. $\cap$) relationship, as proposed in Hypothesis 9, existed between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP.

To determine whether there was a curvilinear relationship between 'perceived general health threats' (PGHT) and the likelihood of a consumer purchasing an HSP, the

squared value of the 'perceived general health threats' (PGHT*PGHT), as a new variable, was added to the *logistic regression* model following Hair et al. (1998) who suggest that a squared term, as a polynomial[29], can be used to test for a curvilinear relationship. The 'orthogonal polynomial contrasts'[30] parameter coding method was used to treat the PGHT*PGHT variable as a categorical variable, and to compute *logistic coefficients* of each category for the purpose of testing quadratic effects.

Table 7.8 shows the parameter coding, summated value, and frequency of PGHT*PGHT. As described in Section 5.3.2, the variable 'perceived general health threats' (PGHT) consisted of three question items with the response format ranging from 1 to 5. Therefore, the summated score of the PGHT ranged from 3 to 15, and so the summate score of PGHT*PGHT ranged from 9 to 225.

Table 7.8 Parameter Codings of PGHT*PGHT by Orthogonal Polynomial Contrasts

Parameter Coding[i]	Summated Scores of PGHT*PGHT	Frequency
PGHT*PGHT (1)	9	72
PGHT*PGHT (2)	16	87
PGHT*PGHT (3)	25	112
PGHT*PGHT (4)	36	163
PGHT*PGHT (5)	49	197
PGHT*PGHT (6)	64	129
PGHT*PGHT (7)	81	94
PGHT*PGHT (8)	100	65
PGHT*PGHT (9)	121	25
PGHT*PGHT (10)	144	11
PGHT*PGHT (11)	169	9
PGHT*PGHT (12)	196	6

[i] Categories are assumed to be equally spaced in 'orthogonal polynomial contrasts'.

[29] The SPSS program manual indicates that categories are assumed to be equally spaced in polynomial (or orthogonal polynomial contrasts), and that polynomial contrasts are available for numeric variables only.
[30] A "contrast" is a set of coefficients that sum to 0 over the levels of the independent categorical variable (Garson 2002c).

From Table 7.9, it can be seen that the addition of 'perceived value of HSPs', 'external cues to action', 'perceived general health threats', and the squared term (PGHT*PGHT) into the *logistic regression* model reduced the score of *–2 LL* from 1224.6138 to 822.198. The *chi-square* value of 402.416 was statistically significant ($df = 3, p < .05$), and so indicated that the unexplained portion of the criterion variable was decreased by the input of the predictors into the model.

Table 7.9 *–2 LL* Change after Including PGHT*PGHT

Model	Variable	*-2 Log Likelihood*	*Chi-square*	*df*	*p*
0	Constant	1224.614			
1	Perceived Value of HSPs External Cues to Action Perceived General Health Threats PGHT*PGHT	822.198	402.416	14	.0000

Note: the variable PGHT*PGHT has its degrees of freedom reduced from 12 to 11

The result of *'Hosmer and Lemeshow Goodness-of-Fit' test* (*chi-square* = 13.2374, $df = 8, p = .1039$) showed that the null hypothesis was not rejected, thus indicating that the *logistic regression* model was a good fit.

As in the previous *logistic regression* analysis (Model I), Table 7.10 shows the same results on the tests of hypotheses 7 and 8. However, it is worth noting that the logistic coefficient of 'perceived general health threats', which was significant ($p < .0016$), turned out to be insignificant ($p = .41$) as a result of the addition of the squared term. Hair et al. (1998) argue that the existence of *multicollinearity*[31] makes statistical significance testing of the polynomial terms inappropriate.

[31] The correlations between the 'perceived general health threat' and the parameter codings of the squared variable PGHT*PGHT were found to be very high (i.e. $R > .61$ for all) except for the parameter coding of 9, 10, 11, and 12 ($R = .38, .17, .06$, and $.02$ respectively).

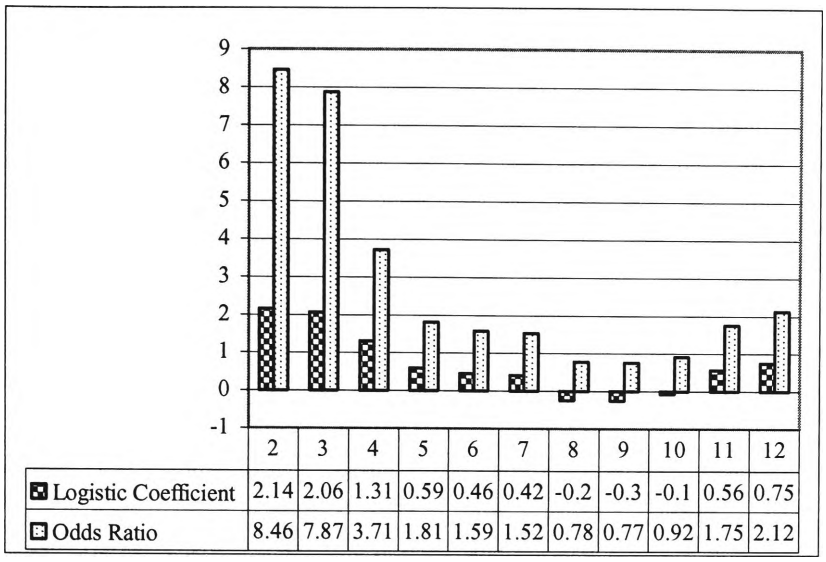
Table 7.10 Multivariate Associations of 'Likelihood of Purchasing an HSP': Stage I after the Addition of PGHT*PGHT

Predictor Variables	*Logistic Coefficient*	*Wald*	*df*	*p*	*Odds Ratio*
Perceived Value of HSPs	.17	93.40	1	.000	1.18
External Cues to Action	.13	63.66	1	.000	1.14
Perceived General Health Threats	.30	.67	1	.412	1.35
PGHT*PGHT		12.81	11	.306	
PGHT*PGHT (2)	2.14	.16	1	.690	8.46
PGHT*PGHT (3)	2.06	.17	1	.680	7.87
PGHT*PGHT (4)	1.31	.10	1	.753	3.71
PGHT*PGHT (5)	.59	.04	1	.850	1.81
PGHT*PGHT (6)	.46	.05	1	.830	1.59
PGHT*PGHT (7)	.42	.09	1	.767	1.52
PGHT*PGHT (8)	-.24	.07	1	.797	.78
PGHT*PGHT (9)	-.25	.13	1	.717	.77
PGHT*PGHT (10)	-.08	.02	1	.884	.92
PGHT*PGHT (11)	.56	1.44	1	.229	1.75
PGHT*PGHT (12)	.75	4.91	1	.027	2.12

If the logistic coefficients change over the contrasts, the quadratic relationship exists (Menard 1995). With respect to the logistic coefficients of the parameter codings (refer Table 7.10), positive coefficients could be seen from PGHT*PGHT (2) through PGHT*PGHT (7), but the coefficients of PGHT*PGHT (8), PGHT*PGHT (9) and PGHT*PGHT (10) were negative, and the coefficients of PGHT*PGHT (11) and PGHT*PGHT (12) became positive. A similar trend of changes was also shown in the *odds ratio*[32] of the parameter codings.

The changes in *logistic coefficients* and *odds ratios* over the polynomial contrasts of PGHT*PGHT are illustrated in Figure 7.12.

[32] The '*odds ratio*' is the exponential functioning (raising the natural log e to the b_1 power) of the logistic coefficient.



	2	3	4	5	6	7	8	9	10	11	12
Logistic Coefficient	2.14	2.06	1.31	0.59	0.46	0.42	-0.2	-0.3	-0.1	0.56	0.75
Odds Ratio	8.46	7.87	3.71	1.81	1.59	1.52	0.78	0.77	0.92	1.75	2.12

Figure 7.12 Changes in Logistic Coefficients and Odd Ratios over Polynomial Contrasts of PGHT*PGHT

From these findings, it was concluded that there was a positive quadratic relationship between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP, which does not support Hypothesis 9. That is, if the level of 'perceived general health threats' increased, the probability of 'purchasing an HSP' decreased, but if the level of 'perceived general health threats' continued to increase, then at a certain point the probability of 'purchasing an HSP' increased again.

7.3.4 Logistic Regression Analysis: Stage II

In the second stage of the *logistic regression* analysis (Model II), the socio-demographic variables were added into Model I to determine whether the addition of these variables would have an impact on the *logistic regression* model. The highlighted box in Figure 7.13 shows this stage of *logistic regression* analysis and the socio-demographic variables involved.

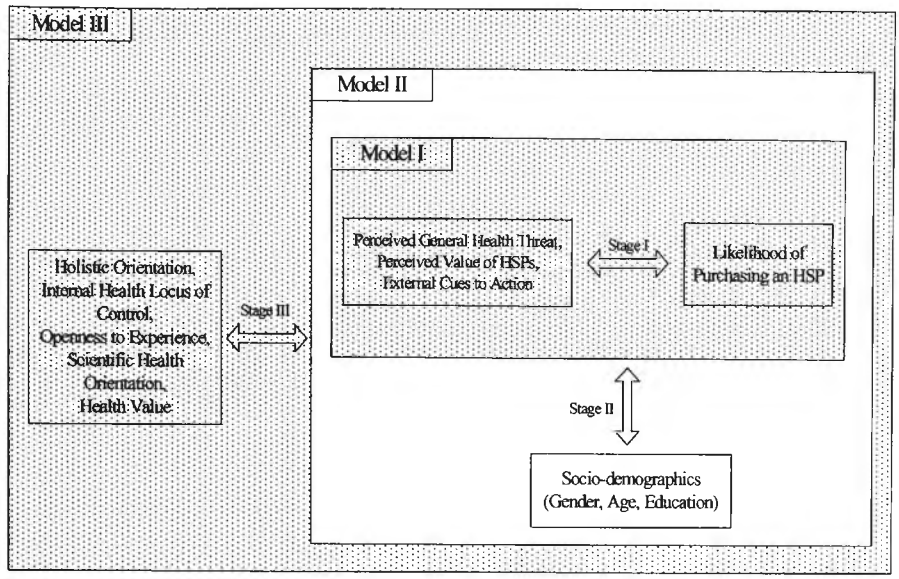


Figure 7.13 Logistic Regression Analysis: Stage II

Table 7.11 shows the parameter codings of gender, age and education, and the frequency of each category in the sample. 'Men' (n = 385), the age group of '35-44' years (n = 222), and 'Not completed secondary school' (n = 290) were represented as the reference categories in the *logistic regression*.

Table 7.11 Parameter Coding of Gender, Age, and Education

Parameter Coding[1]	Frequency
Women (1)	589
Age 18-24 (1)	34
Age 25-34 (2)	168
Age 45-54 (3)	196
Age 55-64 (4)	144
Age 65 + (5)	211
Complete secondary school (1)	154
Vocational (2)	285
University Undergraduate (3)	156
University Postgraduate (4)	89

[1] indicator coding was used

Table 7.12 shows the change of *–2LL* values between Model I and Model II. The reduction of *–2LL* was statistically significant (*chi-square* = 38.846, $df = 10$, $p < .0001$),

indicating that the addition of the socio-demographic variables made a significant contribution to the predictability of the model.

Table 7.12 –*2 LL* Changes: Stage II

Model	Variable	*-2 Log Likelihood*	*Chi-square*	*df*	*p*
0	Constant	1224.6138			
1	Perceived Value of HSPs External Cues to Action Perceived General Health Threats	835.718	388.896	3	.0000
2	Women Age 18-24 Age 25-34 Age 45-54 Age 55-64 Age 65 + Completed secondary school Vocational University Undergraduate University Postgraduate	796.873	38.846	13	.0000

The result of *'Hosmer and Lemeshow Goodness-of-Fit' test* in Stage II indicated that the null hypothesis was not rejected, thus indicating that the *logistic regression* model was a good fit (*chi-square* = 11.2747, *df* = 8, *p* = .1866).

From the results of *logistic regression* analysis, as shown in Table 7.13, it can be seen that the likelihood of a consumer purchasing an HSP was significantly associated with gender (i.e. women, $p < .05$) and age ($p < .05$), but not with education ($p > .05$). On the basis of these findings, it can be concluded that the reduction of *–2LL* showed a statistically significant result (i.e. *chi-square* = 38.846, *df* = 13, $p < .001$), indicating that the addition of gender and age in Stage II made a significant contribution to the predictability of the conceptual model.

Table 7.13 Multivariate Associations of 'Likelihood of Purchasing an HSP': Stage II

Predictor Variables	*Logistic Coefficient*	*Wald*	*df*	*p*	*Odds Ratio*
Perceived Value of HSPs	.17	88.57	1	.0000	1.18
External Cues to Action	.14	65.11	1	.0000	1.14
Perceived General Health Threats	.19	18.96	1	.0000	1.20
Women	.75	15.77	1	.0001	2.12
Age group		22.83	5	.0004	
Age 18-24	-1.5	9.79	1	.0018	.22
Age 25-34	-1.0	11.69	1	.0006	.37
Age 45-54	-.32	1.35	1	.2449	.72
Age 55-64	.15	.23	1	.6285	1.17
Age 65 +	-.06	.05	1	.8146	.94
Education		7.93	4	.0940	
Completed secondary school	.00	.00	1	.9891	1.00
Vocational	.51	4.24	1	.0395	1.66
University Undergraduate	.20	.05	1	.4779	1.22
University Postgraduate	.80	4.66	1	.0309	2.23

The positive coefficient for women also implied that compared to men (i.e. the reference category) they are more likely to purchase an HSP, supporting the proposed Hypothesis 10_b.

Recall that the age group of 35 to 44 years was the reference category. The *logistic regression* coefficients in the other age groups showed negative values except in the age group of '55-64' years. The negative coefficient implies that the respondents in these groups were less likely to purchase an HSP than the respondents in the age group of '35-44' years. Although the age group of '55-64' years showed a positive coefficient (*odds ratio* = 1.17), this result was not significant ($p > .05$). Therefore, it was concluded that the proposed Hypothesis 10_a (i.e. consumers in the age group of '35-44' years tend to have a higher likelihood of purchasing an HSP) was supported by the *logistic regression* analysis.

Compared to the reference category of 'Not completed secondary school', the positive coefficients were shown among those in the education categories of 'Vocational' and 'Postgraduate' (p = .04 and .03 respectively), but there was no increasing trend of the '*odds ratio*' along with an increase in the level of educational attainment. Given the results of the *logistic regression* on the education variable, Hypothesis 10_c (i.e. consumers with a higher level of education tend to have a higher likelihood of purchasing an HSP) could not be supported.

7.3.5 Logistic Regression Analysis: Stage III

The final stage of *logistic regression* (Model III) was to identify whether the personality traits have a direct impact on the likelihood of a consumer purchasing an HSP. The highlighted box in Figure 7.14 shows the third stage of *logistic regression* analysis and the personality traits involved in the analysis.

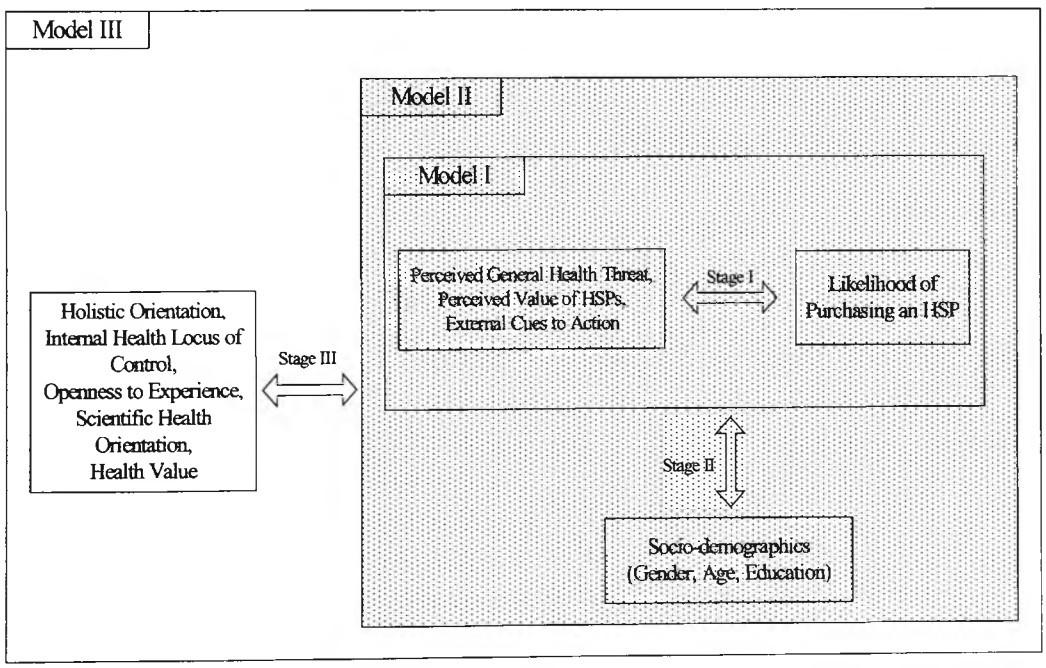


Figure 7.14 Logistic Regression Analysis: Stage III

The *–2LL* score change due to the inclusion of the personality traits into the Model II is shown in Table 7.14. The reduction of *–2LL* did not show a statistically significant result (*chi-square* = 3.753, *df* = 18, $p < .05$), indicating that the addition of the personality traits to the model did not make a significant contribution to the predictability of the model.

Table 7.14 *–2 LL* Changes: Stage III

Model	Variable	*-2 Log Likelihood*	*Chi-square*	*df*	*p*
0	Constant	1224.614			
1	Perceived Value of HSPs External Cues to Action Perceived General Health Threats	835.718	388.896	3	.000
2	Women Age 18-24 Age 25-34 Age 45-54 Age 55-64 Age 65 + Completed secondary school Vocational University Undergraduate University Postgraduate	796.873	38.846	13	.000
3	Holistic Orientation Internal Health Locus of Control Openness to Experience Scientific Health Orientation Health Value	793.119	3.753	18	.586

As shown in Table 7.15, none of the logistic coefficients for the personality traits was a statistically significant, implying that there was no direct association between each individual personality trait and the likelihood of a consumer purchasing an HSP when the other predictors were controlled in the analysis (Model III).

Table 7.15 Multivariate Associations of 'Likelihood of Purchasing an HSP': Stage III

Predictor Variables	*Logistic Coefficient*	*Wald*	*df*	*p*	*Odds Ratio*
Perceived Value of HSPs	.17	85.54	1	.000	1.19
External Cues to Action	.14	61.92	1	.000	1.15
Perceived General Health Threats	.18	14.97	1	.000	1.19
Women	.74	14.89	1	.000	2.01
Age group		20.83	5	.001	
Age 18-24	-1.6	9.81	1	.002	.21
Age 25-34	-1.0	11.42	1	.001	.37
Age 45-54	-.38	1.81	1	.179	.68
Age 55-64	.09	.08	1	.782	1.09
Age 65 +	-.18	.36	1	.546	.84
Education		7.49	4	.112	
Completed secondary school	-.00	.00	1	.985	.99
Vocational	.50	3.94	1	.047	1.65
University Undergraduate	.23	.60	1	.438	1.25
University Postgraduate	.84	4.51	1	.034	2.31
Holistic Orientation	-.01	.06	1	.800	.99
Internal Health Locus of Control	-.03	1.37	1	.243	.97
Openness to Experience	.02	.93	1	.335	1.02
Scientific Health Orientation	-.02	.16	1	.697	.98
Health Value	.05	1.98	1	.159	1.05

The Classification Table, as shown in Table 7.16, indicates how well the model predicts group memberships. As shown in the table, Model III correctly classified 197 respondents who did not show any intention to purchase an HSP but misclassified 117 others (i.e. it correctly classified 62.74% of cases). On the other hand, for those who showed any intention to purchase an HSP, the model correctly classified 581 and misclassified 79 others (i.e. correctly classified 88.03% of cases). The overall accuracy of classification was the weighted average of the two values (79.88%).

Table 7.16 Classification Table for 'Likelihood of Purchasing an HSP'

Observed	Predicted		Percent Correct
	No	Yes	
No	197	117	62.74%
Yes	79	581	88.03%
		Overall	79.88%

Note: the Cut Value is .50

7.3.6 Summary

The *logistic regression* analysis in Stage I showed that there were statistically significant positive associations between the likelihood of a consumer purchasing a Health Supplement Product (HSP) and its antecedent variables: 'perceived value of HSPs', 'perceived general health threats', and 'external cues to action'. 'Perceived value of HSPs' and the 'external cues to action' were the strongest determinants of the likelihood of a consumer purchasing an HSP. It was also found that there was a positive quadratic relationship between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP.

The addition of the socio-demographic variables to Model I increased the predictability of Model II. However, this result came mainly from the two variables 'age' and 'gender'. While the '35-44' year age group and women showed high probability of purchasing an HSP, there was no association between the education and the likelihood of a consumer purchasing an HSP.

The results from *logistic regression* analysis in Model III indicated that the personality traits did not make any statistically significant contribution to the model's predictability. It was concluded that the personality traits had no direct impact on the likelihood of a consumer purchasing an HSP. Overall, the model predicted 79.89% of the responses correctly.

7.4 Results of the Hypothesis Tests

In Chapter 4, a set of ten hypotheses was proposed. M*ultiple regression* analyses (Section 7.2) were used to test the hypotheses 1 through 6, whereas *logistic regression* analyses (Section 7.3) were used to test the hypotheses of 7 through 10. This section discusses the results of the hypotheses tests obtained from both regression analyses in comparison with the findings of the *chi-square* tests (Section 6.3), which examined the bivariate relationships on their own.

The first six research hypotheses postulated the relationships between personality traits (i.e. 'holistic orientation', 'internal health locus of control', 'openness to experience', 'scientific health orientation', and 'health value') and the 'perceived value of HSPs'.

The first hypothesis (H1) proposed a direct relationship between 'holistic orientation' and 'perceived value of HSPs'.

$H1_0$: Consumers with a higher level of 'holistic orientation' do not have a higher 'perceived value of HSPs'.

$H1_1$: Consumers with a higher level of 'holistic orientation' tend to have a higher 'perceived value of HSPs'.

Table 7.3 in Section 7.2.5 listed the *multiple regression* coefficients (B), *t*-statistics, and the significance of *t*-statistics in the regression analysis in Stage I. The *multiple regression* coefficient and *t*-statistics of the 'holistic orientation' were calculated to estimate the individual contribution of this variable to the regression model when the effects of all other predictors are held constant, and to determine whether the individual contribution of the 'holistic orientation' is significantly different from zero. As shown in

Table 7.3, the regression coefficient (B = .30, $t = 3.97$, $p < .001$) of 'holistic orientation' indicated that there was a statistically significant positive relationship between this variable and the 'perceived value of HSPs'. Therefore the null hypothesis ($H1_0$) could be rejected, while the alternative hypothesis ($H1_1$) was supported by the current study. Thus, it was concluded that 'holistic orientation' had a significant positive effect on the 'perceived value of HSPs'.

The second hypothesis (H2) proposed a positive relationship between 'internal health locus of control' and 'perceived value of HSPs'.

$H2_0$: Consumers with a higher level of 'internal health locus of control' do not have a higher 'perceived value of HSPs'.

$H2_1$: Consumers with a higher level of 'internal health locus of control' tend to have a higher 'perceived value of HSPs'.

As shown in Table 7.3 (Section 7.2.5), the *multiple regression* coefficient (B = .20, $t = 4.34$, $p < .001$) of 'internal health locus of control' indicated that there was a statistically significant positive relationship between this variable and the 'perceived value of HSPs'. Therefore the null hypothesis ($H2_0$) could be rejected, while the alternative hypothesis ($H2_1$) was supported by the current study. Thus, it was concluded that 'internal health locus of control' had a significant positive effect on the 'perceived value of HSPs'.

The third hypothesis (H3) proposed a positive relationship between 'health value' and 'perceived value of HSPs'.

$H3_0$: Consumers with a higher level of 'health value' do not have a higher 'perceived value of HSPs'.

$H3_1$: Consumers with a higher level of 'health value' tend to have a higher 'perceived value of HSPs'.

As shown in Table 7.3 (Section 7.2.5), the *multiple regression* coefficient (B = -.10, t = -1.53, $p > .05$) of 'health value' indicated that there was a statistically insignificant negative relationship between this variable and the 'perceived value of HSPs'. Therefore the null hypothesis ($H3_0$) could not be rejected, which means the alternative hypothesis ($H3_1$) was not supported by the current study. Thus, it was concluded that 'health value' did not influence the 'perceived value of HSPs'.

The fourth hypothesis (H4) proposed a moderator effect of the variable 'health value' on the relationship between 'internal health locus of control' and 'perceived value of HSPs'.

$H4_0$: Consumers with a higher level of 'internal health locus of control' do not tend to have a higher 'perceived value of HSPs' when they have a higher level of 'health value'.

$H4_1$: Consumers with a higher level of 'internal health locus of control' tend to have a higher 'perceived value of HSPs' when they have a higher level of 'health value'.

As suggested by Hair et al. (1998), the moderator effect was assessed by the change in R^2 between before and after the addition of the compound variable into the regression model. Table 7.4 (Section 7.2.5) shows the results of R^2 change statistic and its significance. Although there was an incremental effect (R^2 change = .115-.114 = .001),

this increase was marginal and not statistically significant ($p > .05$). Since the moderating effect of the compound variable in the regression model was not significant, the null hypothesis of $H4_0$ could not be rejected and the hypothesis was not supported. It was also speculated that the failure to find support for this relationship in the study could be due to the result of insignificant association between 'health value' and the perceived value of HSPs.

The fifth hypothesis (H5) proposed a direct relationship between 'openness to experience' and 'perceived value of HSPs'.

$H5_0$: Consumers with a higher level of 'openness to experience' do not have a higher 'perceived value of HSPs'.

$H5_1$: Consumers with a higher level of 'openness to experience' tend to have a higher 'perceived value of HSPs'.

As shown in Table 7.3, the *regression coefficient* (B = .22, $t = 5.14$, $p < .001$) of 'openness to experience' indicated that there was a statistically significant positive relationship between this variable and the 'perceived value of HSPs'. Therefore the null hypothesis ($H5_0$) could be rejected, while the alternative hypothesis ($H5_1$) was supported by the current study. Thus, it was concluded that 'openness to experience' had a significant positive effect on the 'perceived value of HSPs'.

The sixth hypothesis (H6) proposed that there was a negative relationship between 'scientific health orientation' and the 'perceived value of HSPs'.

$H6_0$: Consumers with a higher level of 'scientific health orientation' do not have a lower 'perceived value of HSPs'.

$H6_1$: Consumers with a higher level of 'scientific health orientation' tend to have a lower 'perceived value of HSPs'.

As shown in Table 7.3, the *multiple regression* coefficient (B = -.28, t = -2.29, $p < .05$) indicated that there was a statistically significant negative relationship between 'scientific health orientation' and the 'perceived value of HSPs'. Therefore the null hypothesis ($H6_0$) could be rejected, while the alternative hypothesis ($H6_1$) was supported by the current study. However, this effect became statistically insignificant (B = -.14, $p > .1$) when the socio-demographic variables were included into the regression analysis (Table 7.5 in Section 7.2.5). Based on this finding, it was concluded that the alternative hypothesis ($H6_1$) was not supported by the current study.

The three hypotheses (Hypotheses 7, 8, and 9) proposed relationships between the likelihood of a consumer purchasing an HSP (i.e. criterion variable) and the antecedents of this variable, and were tested using the *logistic regression* analyses. The antecedents of the criterion variable were the 'perceived value of HSPs', the 'external cues to action', and the 'perceived general health threats'. The 'propensity to purchase an HSP' was used as the criterion variable in the *logistic regression* analysis. Table 7.7 shows the results of *logistic regression* analysis.

The seventh hypothesis (H7) proposed a relationship between 'perceived value of HSPs' and the likelihood of a consumer purchasing an HSP.

$H7_0$: Consumers with a higher level of 'perceived value of HSPs' do not have a higher likelihood of purchasing an HSP.

$H7_1$: Consumers with a higher level of 'perceived value of HSPs' tend to have a higher 'likelihood of purchasing an HSP.

The *chi-square* test (refer Table 6.26 in Section 6.3.4) indicated there was a statistically significant ($p < .001$) association between the two variables. This association could also be found from the *logistic regression* analysis which controlled the effects of the other predictors. A positive logistic coefficient of 'perceived value of HSPs', as shown in Table 7.7 (Section 7.3.3), was statistically significant (*Wald* = 92.74, $p < .001$, *Odds ratio = 1.18*), implying that as 'perceived value of HSPs' increases by one unit, the likelihood of a consumer purchasing an HSP increases by a factor of 1.18. On the basis of both statistical analyses, the null hypothesis ($H7_0$) could be rejected, while the alternative hypothesis ($H7_1$) was supported. Thus, it was concluded that 'perceived value of HSPs' had a significant positive effect on the likelihood of a consumer purchasing an HSP.

The eighth hypothesis (H8) proposed a relationship between 'external cues to action' and the likelihood of a consumer purchasing an HSP.

$H8_0$: Consumers with a higher level of 'external cues to action' do not have a higher likelihood of purchasing an HSP.

$H8_1$: Consumers with a higher level of 'external cues to action' tend to have a higher likelihood of purchasing an HSP.

The *chi-square* test (refer Table 6.29 in Section 6.3.4) indicated there was a statistically significant ($p < .001$) association between the two variables. This association could also

be found from the *logistic regression* analysis, in which the effects of the other predictors were controlled. A positive logistic coefficient of 'external cues to action', as shown in Table 7.7 in Section 7.3.3, was statistically significant (*Wald* = 65.36, $p <$ .001, *Odds ratio* = 1.14), implying that as 'external cues to action' increases by one unit, the likelihood of a consumer purchasing an HSP increases by a factor of 1.14. On the basis of both analyses, the null hypothesis ($H8_0$) could be rejected, while the alternative hypothesis ($H8_1$) was accepted. Thus, it was concluded that 'external cues to action' had a significant positive effect on the likelihood of a consumer purchasing an HSP.

The ninth hypothesis (H9) proposed a relationship between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP.

$H9_0$: There is no negative quadratic relationship between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP.

$H9_1$: There is a negative quadratic relationship between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP.

The *chi-square test* ($p < .01$) and the *logistic regression* analysis (B = .18, *Wald* = 14.97, $df = 1, p < .001$) showed there was a statistically significant association between the two variables. However, these results did not address the curvilinear relationship between the variables.

To identify the curvilinear relationship between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP, the squared value of 'perceived general health threats' was added to the *logistic regression* model as a new variable.

From the results of the *logistic regression* analysis (refer Table 7.10 in Section 7.3.3), it was concluded that there was a positive quadratic relationship between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP. That is, if the level of 'perceived general health threats' increased, the probability of 'purchasing an HSP' decreased, but if the level of 'perceived general health threats' continued to increase past a certain point, the probability of 'purchasing an HSP' increased again. In conclusion, the null hypothesis ($H9_0$) could not be rejected and the alternative hypothesis ($H9_1$) was therefore not accepted in the current study.

The final set of hypotheses proposed relationships between the likelihood of a consumer purchasing an HSP, and the socio-demographic variables of age, gender and education variables. The hypothesis (H10a) proposed a relationship between 'age' and the likelihood of a consumer purchasing an HSP.

$H10a_0$: Consumers in the age group of 35 to 44 years do not have a higher likelihood of purchasing an HSP'.

$H10a_1$: Consumers in the age group of 35 to 44 years tend to have a higher likelihood of purchasing an HSP.

The *chi-square* test on 'age' vs the likelihood of a consumer purchasing an HSP (refer Table 6.13 in Section 6.3.2) showed that there was a significant association ($p < .001$) between the two variables. Further analysis showed that among all the age groups, the age group of '35-44' years was the group most likely to purchase an HSP in the next twelve months (i.e. 76.9% of those with the age group indicated that they are likely to purchase an HSP in the next twelve months). This finding matched with the results of the *logistic regression* analysis (refer Table 7.13 in Section 7.3.4). The statistical

analyses from the *chi-square* test and the *logistic regression* indicated that the null hypothesis ($H10a_0$) could be rejected and the alternative hypothesis ($H10a_1$) accepted in the current study. It was therefore concluded that the age group of '35-44' years tended to have a higher HSP purchasing propensity.

The hypothesis (H10b) proposed a relationship between 'gender' and the likelihood of a consumer purchasing an HSP.

$H10b_0$: Compared to men, women do not have a higher likelihood of purchasing an HSP.

$H10b_1$: Compared to men, women tend to have a higher likelihood of purchasing an HSP.

The *chi-square* test (refer Table 6.14 in Section 6.3.2) showed that there was a significant association ($p < .001$) between the two variables. Further analysis supported this finding that women were more likely to have an HSP purchasing propensity. This association could also be found from the *logistic regression* analysis which controlled the effects of the other predictors. A positive logistic coefficient in women, as shown in Table 7.13 in Section 7.3.4, was statistically significant (*Wald* = 15.77, $df = 1$, $p < .001$, *Odds ratio* = 2.12), indicating that women were more likely to purchase an HSP in the next twelve months. The probability of women purchasing an HSP was about ten[33] times higher than the purchase propensity of men. Both the *chi-square* test and the *logistic* regression indicated that the null hypothesis ($H10b_0$) could be rejected and the alternative hypothesis ($H10b_1$) accepted. In conclusion, compared to men, women tended to have a higher likelihood of purchasing an HSP.

[33] When the logistic coefficient = 2.303, the log odds ratio (the exponential functioning, Exp(b)) is 10.

The hypothesis (H10c) proposed a relationship between 'education' and the likelihood of a consumer purchasing an HSP.

$H10c_0$: Consumers with a higher level of education do not have a higher likelihood of purchasing an HSP.

$H10c_1$: Consumers with a higher level of education tend to have a higher likelihood of purchasing an HSP.

The *chi-square* test (refer Table 6.15 in Section 6.3.2) found that, contrary to expectation, there was no statistically significant association ($p > .05$) between the two variables. This finding was confirmed from the results of the *logistic regression* analysis. As shown in Table 7.13 in Section 7.3.4, there was no increasing trend of the *logistic coefficients* and the *odds ratio* along with higher levels of education. From the statistical analyses both from the *chi-square* test and the *logistic regression*, it was therefore concluded that the null hypothesis ($H10c_0$) could not be rejected and the alternative hypothesis ($H10c_1$) was not supported in the current study. In conclusion, the 'education' had an insignificant effect on the likelihood of a consumer purchasing an HSP.

7.5 Justification of the Proposed Conceptual Model

Figure 7.15 shows the relationships of the variables as they appeared in the proposed conceptual model. This diagram was adapted from the models (Lindley and Walker 1999, Baron and Kenny 1986) which illustrate distinctions between moderator and mediator functions.

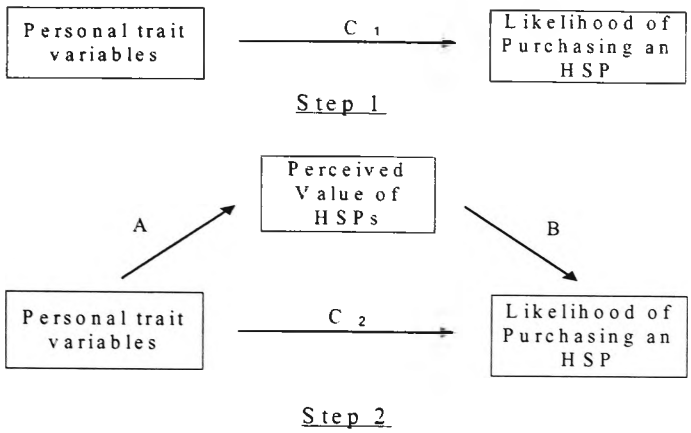


Figure 7.15 Mediating Effects of the Perceived Value of HSPs

Source: Baron, R. M. & Kenny, D. A. (1986). "The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations." Journal of Personality and Social Psychology **51** (6): 1173-1182.

Several kinds of statistical analyses were used to test the relationships of the variables illustrated in Figure 7.15. For example, Path A in Step 2 (i.e. explaining the relationships between the personality traits and 'perceived value of HSPs') was tested using *multiple regression* analyses. Path B in Step 2 (i.e. explaining the relationship between 'perceived value of HSPs' and the likelihood of purchasing an HSP) was tested using *logistic regression* analysis. Path C_1 in Step 1 and Path C_2 in Step 2, which all explain the relationships between the personality traits and the likelihood of purchasing an HSP, were tested using *chi-square* tests and *logistic regression* respectively.

The *multiple regression* analyses showed that there were statistically significant relationships (Path A in Step2) between the personality traits and the perceived value of HSPs (refer Table 7.3 in Section 7.2.5). Also the *logistic regression* analyses showed that there was a statistically significant relationship (Path B in Step2) between the perceived value of HSPs and the likelihood of a consumer purchasing an HSP (refer Table 7.7 in Section 7.3.3). The results of the *chi-square* tests (Path C_1 in Step1) indicated that there were statistically significant associations between the likelihood of a

consumer purchasing an HSP and the personality traits (refer Tables 6.16, 6.18, and 6.21 in Section 6.3.3) with the exception of 'scientific health orientation' and 'health value'. However, when the relationships between the personality trait variables and the likelihood of purchasing an HSP were tested in the conceptual model (Path C_2 in Step 2) using *logistic regression*, it was found that the relationships were not statistically significant (refer Table 7.15 in Section 7.3.5).

On the basis of these statistical results, it was concluded that the previously significant associations between the personality traits and the likelihood of purchasing an HSP (i.e. Path C_1 in Step 1) were not direct ones, but were mediated through 'perceived value of HSPs'. In addition, the findings from both *multiple regression* and *logistic regression* demonstrated that 'gender' and 'age' increased, to a minor degree, the predictability of the proposed conceptual model.

These findings supported the proposed conceptual model which illustrates the relationships between variables in that: (1) the personality traits are the antecedents of 'perceived value of HSPs'; (2) the effects of the personality traits on the likelihood of a consumer purchasing an HSP are not direct ones, but are mediated through the 'perceived value of HSPs' variable (i.e. are 'indirect'); (3) these indirect effects disappear when the perceived value of HSPs (i.e. as a mediator) is controlled; and (4) the socio-demographics are the predictor variables which affect the 'likelihood of a consumer purchasing an HSP'.

7.6 Summary

This chapter first discussed the results of the multivariate analyses of the survey data. Next the results of the hypotheses tests were reviewed. Finally, the proposed conceptual model was justified by looking at the relationships among the variables in the model.

The findings from the *multiple regression* analyses demonstrated that 'holistic orientation', 'internal health locus of control', and 'openness to experience' had positive associations with the 'perceived value of HSPs'. However, 'scientific health orientation' and 'health value' did not show any statistically significant associations with the 'perceived value of HSPs'. The 'health value' did not show any moderating effect on the relationship between 'internal health locus of control' and the perceived value of HSPs.

The findings from the *logistic regression* analyses principally showed that the strongest determinants of the likelihood of a consumer purchasing an HSP were 'perceived value of HSPs', and 'external cues to action'. Although there was a statistically significant association between the likelihood of a consumer purchasing an HSP and 'perceived general health threats', it was rather weak and a positive quadratic relationship between the variables was found. 'Age' and 'gender' showed statistically significant associations with the likelihood of a consumer purchasing an HSP, but 'education' did not. The women in the age group of '35-44' years had a much higher HSP purchasing propensity.

Finally, the proposed conceptual model was justified by looking at the relationships among the variables in the model.

Chapter Eight

DISCUSSION AND CONCLUSIONS

8.1 Introduction

The findings from the *multiple regression* and the *logistic regression* analyses were presented in the previous chapter. This final chapter of this thesis commences with a summary of the research hypotheses and its test results, and the changes made between the proposed conceptual model and the revised conceptual model in explaining and predicting the likelihood of a consumer purchasing Health Supplement Products (HSPs). The chapter continues to discuss the contributions of the current study in relation to the literature. Subsequently, academic and managerial contributions are discussed. Finally, the limitations of this study and proposals for future research are considered.

8.2 Summary of the Main Findings

As shown in Table 8.1, a summary of the research hypotheses and the test results are provided under the heading of each research question. While seven research hypotheses (H1, H2, H5, H7, H8, H10a, and H10b) have been supported from the empirical test, five research hypotheses have not (H3, H4, H6, H9 and H10c).

Table 8.1 Research Questions, Research Hypotheses, and Results of Hypotheses Tests

Research Question 1: Are certain personality traits associated with consumers' perceptions of the value of Health Supplement Products (HSPs)?		
Research hypotheses		Supported?
H1	Consumers with a higher level of 'holistic orientation' tend to have a higher 'perceived value of HSPs'.	Yes
H2	Consumers with a higher level of 'internal health locus of control' tend to have a higher 'perceived value of HSPs'.	Yes
H3	Consumers with a higher level of 'health value' tend to have a higher 'perceived value of HSPs'.	No
H4	Consumers with a higher level of 'internal health locus of control' tend to have a higher 'perceived value of HSPs' when they have a higher level of 'health value'.	No
H5	Consumers with a higher level of 'openness to experience' tend to have a higher 'perceived value of HSPs'.	Yes
H6	Consumers with a higher level of 'scientific health orientation' tend to have a lower 'perceived value of HSPs'.	No
Research Question 2: To what extent do the elements of the Health Belief Model explain and predict the likelihood of a consumer purchasing a Health Supplement Product (HSP)?		
Research hypotheses		Supported?
H7	Consumers with a higher level of 'perceived value of HSPs' tend to have a higher likelihood of purchasing an HSP.	Yes
H8	Consumers with a higher level of 'external cues to action' tend to have a higher likelihood of purchasing an HSP.	Yes
H9	There is a negative quadratic relationship between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP.	No
Research Question 3: Do age, gender, and education affect the likelihood of a consumer purchasing a Health Supplement Product?		
Research hypotheses		Supported?
$H10_a$	Consumers in the age group of 35 to 44 years tend to have a higher likelihood of purchasing an HSP.	Yes
$H10_b$	Compared to men, women tend to have a higher likelihood of purchasing an HSP.	Yes
$H10_c$	Consumers with a higher level of education tend to have a higher likelihood of purchasing an HSP.	No

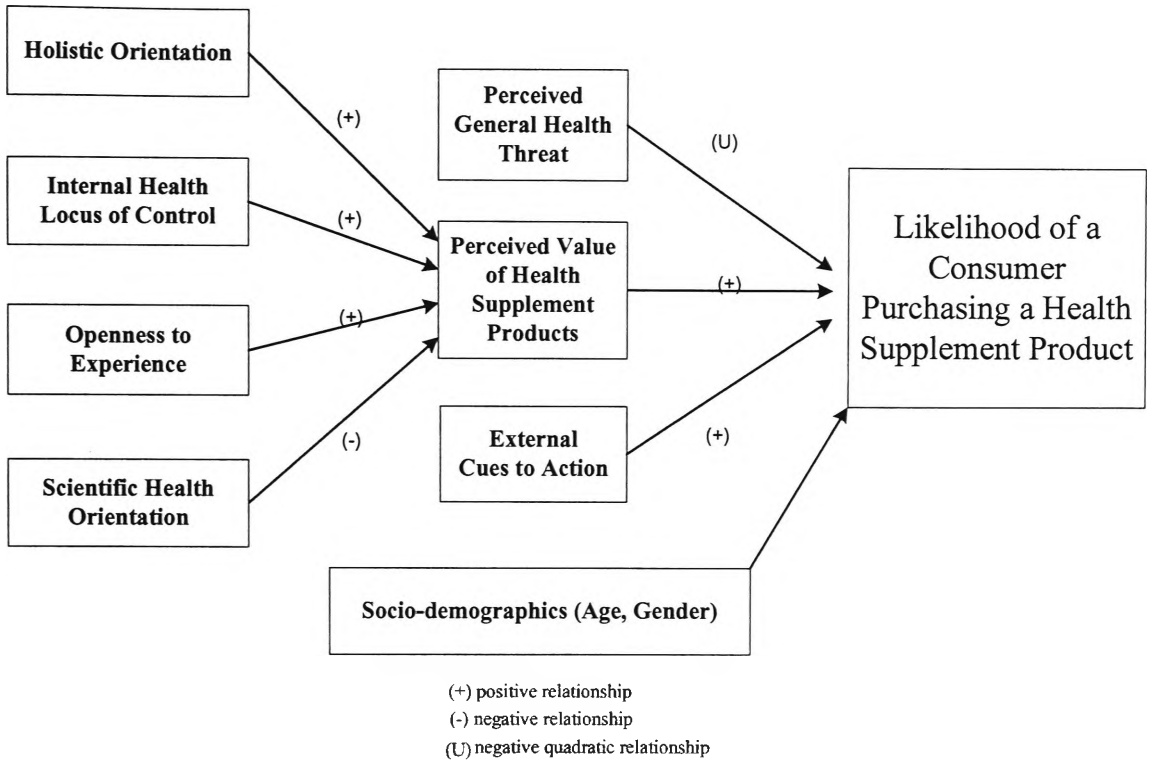


Figure 8.1 Revised Conceptual Model of the Likelihood of a Consumer Purchasing an HSP

Based on the results of the hypotheses testing, three main changes have been made to the proposed conceptual model. The revised conceptual model is shown in Figure 8.1. The first change was that the 'health value' variable was omitted (refer to Figure 4.1 in Section 4.3), since its corresponding hypotheses (H3 and H4) were not supported from the empirical test.

Secondly, the negative quadratic relationship ($\cap$) between 'perceived general health threat' and the likelihood of a consumer purchasing an HSP in the initial hypothesis (H9) was not supported, but instead the relationship turned out to be as positive quadratic one ($\cup$) as shown by the results of the *logistic regression* analysis (refer Table 7.10 in Section 7.3.3). A possible explanation for this unexpected result will be

discussed in Section 8.3.2. Also, education has been omitted, since $H10_c$ was not supported from the empirical test.

However, contrary to the result of the statistical analysis on Hypothesis 6 (i.e. not supported), the 'scientific health orientation' variable has been retained in the revised conceptual model. Notwithstanding that efforts have been made to improve the internal consistency of the 'scientific health orientation' instrument after the pretesting (the *alpha* = 0.45 at the pretesting), unfortunately the *alpha* score (i.e. *alpha* = 0.26) of the 'scientific health orientation' in the survey data deteriorated rather than improved. It has therefore been concluded that further studies with a more reliable 'scientific health orientation' construct should be undertaken.

8.3 Discussion of the Survey Findings

In this section, the findings of the survey are presented in accordance with underlying each research question. The results of the hypotheses tests are discussed under the headings of the related variables and compared with the previous findings in the literature.

8.3.1 Research Question 1: Are certain personality traits associated with consumers' perceptions of the value of Health Supplement Products?

Research Question 1 was specifically addressed by six research hypotheses (from H1 through H6). From the preliminary qualitative study and literature review, five personality traits were identified as having associations with the 'perceived value of Health Supplement Products (HSPs)'. These were 'holistic orientation', 'internal health

locus of control', 'health value', 'openness to experience', and 'scientific health orientation'. The 'perceived value of HSPs' was defined as consumers' perceptions and attitudes toward Health Supplement Products and operationalised as a subtraction of the summated score of 'perceived barriers or costs of HSPs' from that of 'perceived benefits of HSPs'. Under the heading of each personality trait, the finding on each hypothesis test is discussed vis-à-vis those described in the previous Complementary and Alternative Medicine (CAM) studies.

Holistic Orientation

'Holistic orientation' was defined as the degree of a consumer's congruence with holistic views or principles, which emphasise the importance of the connection of body, mind, and spirit, and recognise the body's own power of natural healing (Apostolides 1996, Otto and Knight 1979).

In this study, the *multiple regression* analysis supported the hypothesis that consumers with a higher level of 'holistic orientation' tend to have a higher 'perceived value of HSPs' (Research Hypothesis 1). It was also found from the *chi-square* test in the current study that there was a statistically significant positive association between 'holistic orientation' and the likelihood of a consumer purchasing an HSP. However, on the basis of the finding of the *logistic regression* analysis in the current study, it was concluded that this association was not a direct one, but was mediated through the 'perceived value of HSPs' (i.e. was 'indirect').

This result is consistent with the findings from the previous CAM studies described in the literature. In a questionnaire survey among the patients of a cancer centre and pain

management centre, and community samples, Owens et al. (1999) found a 'holistic health philosophy' was predictive of CAM use. In a semi-structured interview study with 300 patients from family medicine and four kinds of alternative health-care in Canada (Kelner and Wellman 1997), many patients of alternative health-care reported that they had chosen an alternative therapy because they believed in it and in its principles. Holistic beliefs were frequently mentioned among the users of CAM in qualitative studies (Murray and Shepherd 1993, Sharma 1992). These studies showed that the users of CAM believed in the body's natural ability to heal itself by re-establishing 'balance', and favoured the CAM practitioners' holistic views.

Similarly, Vincent and Furnham (1996) demonstrated that a 'holistic view' was the main reason for CAM use among patients visiting CAM practices. From factor analysis of the twenty reasons for using CAM, Vincent and Furnham conclude the perceived value of a holistic approach was one of the most strongly supported reasons. In an explorative survey among 289 patients from eight different alternative therapy practices in Australia, Lloyd et al. (1993) conclude that the respondents valued the holistic approach of the alternative therapist.

The congruency with holistic views among patients of CAM practices also appears in a study involving the product form of CAM. Wagner et al. (1999), in a telephone survey on 22 users of Saint John's Wort, contended that Saint John's Wort use could be predicted from a philosophical acceptance of holistic natural health.

The findings from the current study provide support for the findings of the previous CAM studies in the literature showing a strong association between holistic orientation

and CAM use. However, there is still scope for studies of the direction of causation, i.e. whether those with higher 'holistic orientation' were attracted to CAM by the acknowledgment and the emphasis of the interrelationship of mind, body, and spirit in alternative health-care; or whether the experience with a range of CAM led them to form views congruent with the holistic views of the CAM paradigm.

Internal Health Locus of Control

The 'health locus of control' concept posits that individuals with "internal" rather than "external" expectancies are more likely to take action to improve their health habits (Lau and Ware 1981, Wallston et al. 1978). A high score on the 'internal health locus of control' indicates a person feels in control of his or her own health (e.g. "I am directly responsible for my health"), whereas a low score indicates a person feels health is due to circumstances of chance and beyond his or her own control.

In this study, the *multiple regression* analysis supported the hypothesis that consumers with a higher level of 'internal health locus of control' tend to have a higher 'perceived value of HSPs' (Research Hypothesis 2). It was also found from the *chi-square* test in the current study that there was a statistically significant positive association between 'internal health locus of control' and the likelihood of a consumer purchasing an HSP. However, on the basis of the finding of the *logistic regression* analysis in the current study, it was concluded that this association was not a direct one, but was mediated through the 'perceived value of HSPs' (i.e. was 'indirect').

Compared to the other personality traits tested in the present study, the 'internal health locus of control' has been one of the most frequently tested variables in the previous

CAM studies in the literature. However, the effect of 'internal health locus of control' on CAM use has been inconsistent in the literature. Some studies (Berg and Arnetz 1998, Furnham et al. 1995, Furnham and Smith 1988) have found that there was no evidence that CAM use differed considerably across the 'internal health locus of control'.

However, there are other studies showing the association between 'internal health locus of control' and CAM use. For example, the users of CAM tend to favour active participation (Vincent et al. 1997), to value personal control (Wagner et al. 1999), and to take a proactive role in maintaining their own health and preventing illness by taking vitamins and monitoring diets (Pawluch et al. 1994). Lewith (2000) assumes that patients may use CAM largely to empower themselves to lessen the intensity of, and to manage, their chronic illness. Kelner and Wellman's (1997) study shows that the users of CAM emphasised taking responsibility for their own health, whereas the nonusers of CAM were more likely to subscribe to the belief that, for most illnesses, it is the physician who can help them most. Cassileth et al. (1984) indicated that almost all patients who received alternative treatment believed that they should take an active role in their health-care, but fewer patients receiving conventional therapy shared this view.

Consistent with the findings of the previous CAM studies showing the association between 'internal health locus of control' and CAM use, the present study provides further evidence of the significance of 'internal health locus of control' in the prediction of the likelihood of a consumer purchasing an HSP.

Health Value

'Health value' was defined as the perceived importance or value attached to health by consumers (Lau et al. 1986). The importance of measuring health value in predicting health-related behaviours has been stressed with the combined measurement of other variables such as health beliefs (Becker et al. 1972, Maiman and Becker 1974).

In this study, the *multiple regression* analysis did not support the hypothesis that consumers with a higher level of 'health value' tend to have a higher 'perceived value of HSPs' (Research Hypothesis 3). It was also evident from the *chi-square* test in the current study that there was no statistically significant positive association between 'health value' and the likelihood of a consumer purchasing an HSP. Nor was the moderating effect of 'health value' on the relationship between 'internal health locus of control' and the perceived value of HSPs (formulated in Research Hypothesis 4) was supported from the regression analysis of the current survey. Due to these results, the 'health value' variable was removed in the revised conceptual model (refer to Figure 8.1).

It is speculated that the rejection of Hypotheses 3 and 4 might have resulted from the use of rating methods rather than ranking methods in the measurement of 'health value'. Although there has been discussion about the pros and cons of both methods (Alwin and Krosnick 1985), recent values studies show a trend of using some type of rating method (Shrum and McCarty 1997). Main reasons for using a rating method for the measurement of 'health value' in the current study were: (1) the measurement of relative importance on health against other values (i.e. by ranking methods) require a

long list of question items[34]; (2) the ranking methods, which produce ordinal rather than interval data, do not allow the use of more sophisticated statistical analysis such as multiple regression analyses, all of which are important in explaining relationships among a variety of variables; and (3) an existing scale of 'health value' in the literature produced good internal consistency reliability with 4-items (Lau et al. 1986, alphas were 0.72 and 0.63). For these reasons, the current study used the rating method and borrowed Lau's scale without modifications. Indeed, the internal reliability scores of the 'health value' (*alpha* = 0.54 at the pretesting, and *alpha* = 0.50 after the survey) were shown to be reasonable[35] to be used in the analysis of the current empirical study.

However, Shrum and McCarty (1997) have emphasised that standard rating methods tend to produce data that show little differentiation among the values since the values rated are intrinsically positive entities, few people considering the values to be unimportant. Kristiansen (1987) also argued that considering the value placed on health in relation to other values, it may be more profitable to use a relative measure rather than the absolute measure of 'health value', which was used in the present study.

Since the current study was the first to date which has included and tested 'health value' as a predictor of HSP purchase propensity, further studies using alternative rating techniques[36] would be of value to confirm the validity of the current findings.

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[34] There are 18 terminal values (Rokeach 1973)

[35] Helmstadter (1973) regarded an alpha score of .5 as the satisfactory standard reliability coefficient.

[36] Examples of the alternative rating techniques include "rank-then-rate" and "least-most" procedures (Shrum and McCarty 1997, Munson 1984). In "rank-then-rate" procedure, respondents are asked to first rank the set of values in order of importance, and then asked to go back and rate values on some sort of interval scale. On the other hand, in "least-most" procedure, respondents are asked to scan the list of values and choose the most important value, then to scan the list again and choose the least important value.

Openness to Experience

McCrae and Costa (1983) define 'openness to experience' as the common core of attitudes such as willingness to try new activities, intellectual curiosity, a flexible approach to social and moral values, awareness and appreciation of emotional responses and artistic sensitivity.

In this study, the *multiple regression* analysis supported the hypothesis that consumers with a higher level of 'openness to experience' tend to have a higher 'perceived value of HSPs' (Research Hypothesis 5). It was also found from the *chi-square* test in the current study that there was a statistically significant positive association with the 'openness to experience' and the likelihood of a consumer purchasing an HSP. However, on the basis of the finding of the *logistic regression* analysis in the current study, it was concluded that this association was not a direct one, but was mediated through the 'perceived value of HSPs' (i.e. was 'indirect').

In a telephone survey among Saint John's Wort users in the U.S.A. (Wagner et al. 1999), those who had used Saint John's Wort expressed a willingness to experiment and try new things. Wagner et al. add that 'openness' will increase the likelihood of choosing non-traditional treatment when combined with other variables such as a distrust of conventional medicine and placing a high value on personal control.

There has been additional support in the literature for the prediction that the 'openness to experience' would have an effect on CAM use, even though 'openness to experience' was not explicitly tested. The traits inherent to the 'openness to experience' can be

found in some of the CAM studies. Such traits included: (1) 'absorption'; (2) 'curiosity'; (3) 'willingness to try new things'; and (4) 'unconventionality'.

First, Roche and McConkey (1990) maintain that 'absorption' is a characteristic of individuals who are open to experience, emotional and cognitive alterations across a variety of situations. Owens et al. (1999), in an individual differences study on CAM, found a strong 'absorption' was a strong predictor of high CAM use. Second, Mitzdorf et al. (1999) included patients' curiosity about CAM therapies as possible factors favouring an alternative medicine hospital. Third, Berg and Arnetz's (1998) study with dermatological patients who were using CAM showed that one of the most common reasons for CAM use was that they 'wanted to try everything'. Finally, 'unconventionality' was found to be one of most distinguishable variables in the user group of Touch for Health (McGregor and Peay 1996), even though the conceptual definition of this term was not clearly described.

On the other hand, a study on cancer patients' CAM use (Begbie et al. 1996) indicated that it was not clear whether a willingness to 'try something different' resulted from the personal sense of despair in the face of the failure of conventional medicine treatment; or whether it was the consequence of the patients' existing attitude of 'openness to experience'. Similarly, Astin (1998) found that, contrary to his hypothesis, being a 'cultural creative' was not a significant predictor of primary reliance on CAM. The 'cultural creatives' are individuals who are open to new experience, who think holistically, and who place high values on art and aesthetic experience (Owens et al. 1999, Ray 1998).

The findings from the current study provide support for the results of previous CAM studies in the literature showing a strong association between 'openness to experience' (or similar concepts) and CAM use.

Scientific Health Orientation

In this study, 'scientific health orientation' was defined as a perception that science was important and that its impact on health-care was important to improvements in health-care (Gould and Plank 1987). Thus, people with a high 'scientific health orientation' would use scientific reports to make health-related decisions, believing that science is important to helping them make those decisions (Plank and Gould 1990).

In this study, the first stage of *multiple regression* analysis, which incorporated only the personality traits as the predictors, supported the hypothesis that consumers with a higher level of 'scientific health orientation' tend to have a lower level of 'perceived value of HSPs' (Research Hypothesis 6). However, given the finding that this negative correlation became a statistically insignificant after the inclusion of the socio-demographics into the *multiple regression* analysis in the current study, it was concluded that the observed association in the first stage of the regression analysis was due to the confounding effect from the socio-demographics. Therefore the null hypothesis of no correlation could not be rejected. It has also been noted that the *logistic regression* analysis in the current study did not show any statistically significant correlation between 'scientific health orientation' and the likelihood of a consumer purchasing an HSP.

Unlike the other personality traits used in the current study, the 'scientific health orientation' was not frequently tested as a concept in the previous CAM studies in the literature. A review of the literature has shown that to date there appear to be only two CAM studies incorporating scientific beliefs. Furnham et al. (1995), and Vincent et al. (1995) tested scientific health beliefs among patients of a general practice and three different types of CAM practices (osteopathy, homoeopathy, and acupuncture). These two studies have shown that there were different scientific beliefs between patients of the acupuncture group and the general practice group. For example, the acupuncture group attached significantly less importance to science than the general practice group (Vincent et al. 1995), whereas the general practice group had most faith in medical science and showed most support for the use of scientific methodology (Furnham et al. 1995). However, these studies did not show any difference in scientific beliefs between patients of the other two types of CAM (i.e. osteopathy and homoeopathy) and the general practice patients.

Unfortunately, the *alpha* score of the 'scientific health orientation' significantly decreased from .45 at the pretesting to .26 in the survey. Although it was not clear why this happened, the low *alpha* score of the 'scientific health orientation' scale suggests that further studies with a more reliable instrument of the 'scientific health orientation' are warranted.

8.3.2 Research Question 2: To what extent do the elements of the Health Belief Model explain and predict the likelihood of a consumer purchasing a Health Supplement Product?

Research Question 2 was specifically addressed by three research hypotheses (H7, H8, and H9). The health beliefs elements of the proposed conceptual model were the 'perceived general health threats' and the 'perceived value of Health Supplement Products (HSPs)'. The 'external cues to action' was also included as a separate element of the model. Three research hypotheses were developed from these elements in the proposed conceptual model. The findings from the survey are discussed in relation to each hypothesis and compared to the findings described in the previous Complementary and Alternative Medicine (CAM) studies.

Perceived General Health Threats

The 'perceived general health threats' was defined as a composite of the 'perceived severity' of and the 'perceived susceptibility' to certain illnesses, together with the 'perceived general health status'.

In this study, the analysis of *logistic regression* did not support the view (formulated in Research Hypothesis 9) that there is a negative quadratic relationship (i.e. $\cap$) between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP. Instead the analysis has shown that there was a positive quadratic relationship (i.e. $\cup$) between those two variables. The positive quadratic relationship implies that those who have extreme levels (i.e. mild or severe) of the 'perceived general health threats' are more likely to purchase an HSP.

This result is not consistent with the findings from previous HBM and CAM studies. For example, Becker and Maiman (1975) maintain that both high and low extremes in the levels of 'perceived severity' extremes are associated with a low likelihood of taking preventive health action (i.e. ∩). Wagner et al. (1999) also showed that the users of Saint John's Wort (i.e. a herb used for depression) perceived their depressive mood as mild; and indicated that if they had been suffering more severe depression, they would have sought medical help instead of choosing SJW as a form of self-treatment.

In this study, the result of a positive quadratic relationship between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP might be interpreted as being that consumers self-treat with HSPs when they perceive the level of health threat is being minor (i.e. low extreme), but this trend of self-treatment decreases when the level of threats continues to grow (i.e. moderate). However, if the threat is perceived as severe (i.e. high extreme), consumers also may adopt any possible health-care options including self-treatment as well as seeking help from conventional or alternative health-care professionals.

Haug et al. (1989) asserted that people experiencing a symptom perceived as serious would tend to seek a physician's advice rather than relying on self-treatment. Brown and Segal (1996), in a study of home remedy use and compliance with prescribed medicines among hypertension patients, found that those who did not strongly believe that hypertension was a serious disease were 2.8 times more likely to use home remedies compared to those who did strongly believe hypertension was serious. However, these findings only imply two different levels of perceived severity (i.e. either high or low) rather than three levels (i.e. mild, moderate, and severe). Thus defining the

nature of curvilinear relationships is made difficult, since this negative linear relationship can be applied between 'mild' and 'moderate' or between 'moderate' and 'severe'.

On the other hand, Astin (1998) showed that the perception of poor health status and current health problems were the strong predictors of CAM use. Brown and Segal (1996) found that when the 'perceived severity of hypertension' (i.e. "fear" component in the perceptions on severity) increase, the probability of using home remedies was increased. These two studies imply that a high level of perception on the severity of illnesses (i.e. findings on "fear" in Brown and Segal's study) or the perception of poor health status (i.e. findings from Astin's study) is closely related to the use of CAM.

Similarly, the *logistic regression* analysis of the survey data (refer Section 7.3.3) has shown that those with a higher 'perceived general health threats' are more likely to purchase an HSP (*Coefficient* = .14, $df = 1$, *Odds ratio* = 1.15, $p < .000$). That is, every one-unit increase in the level of 'perceived general health threats' increased the probability of purchasing HSPs by a factor of 1.15.

Perceived Value of Health Supplement Products

The 'perceived value of HSPs' was defined as a subtraction of the summated score of 'perceived barriers or costs of HSPs' from that of 'perceived benefits of HSPs'. The 'perceived benefits of HSPs' was termed as one's belief in the positive consequences of using HSPs to reduce susceptibility to a health problem or to increase general well-being, whereas the 'perceived costs or barriers of HSPs' was defined as one's perception of negative aspects of using HSPs.

In this study, the *logistic regression* analysis supported the hypothesis that consumers with a higher level of 'perceived value of HSPs' tend to have a higher likelihood of purchasing an HSP (Research Hypothesis 7). From the results of the *logistic regression* analysis in the current study, it was also found that, of all the variables included in the proposed conceptual model, the 'perceived value of HSPs' was the most powerful predictor of the likelihood of a consumer purchasing an HSP.

This result supports the findings of previous CAM studies. Brown and Segal (1996) conducted a comparative study of the use of home remedies and prescribed medicines amongst hypertension patients. They concluded that the respondents were more likely to use home remedies when their beliefs in the benefits of home remedies outweighed any concern with the associated costs or barriers.

Some researchers only considered whether CAM use was related to a dissatisfaction with conventional medicine (Wagner et al. 1999, Siahpush 1999, Astin 1998, Berg and Arnetz 1998), the safe nature of CAM (Wagner et al. 1999, Breuner et al. 1998), or simply to the effectiveness of CAM (Owens et al. 1999, Vincent and Furnham 1996, Spigelblatt 1995). These studies did not evaluate the combination of the two dimensions: the benefits, on the one hand, and the costs or barriers on the other hand. Since the decision to use a form of CAM is a result of consumers' cost-benefit analysis, both dimensions should therefore be included.

The current study has firstly supported the hypothesis that consumers with a higher level of 'perceived value of HSPs' tend to have a higher likelihood of purchasing an HSP, and secondly the multivariate analysis has demonstrated that the 'perceived value

of HSPs' was the strongest predictor of the likelihood of a consumer purchasing an HSP among all the predictors in the conceptual model. This strong predictive power may be, as explained in expectancy-value theory (Peak 1955) and subjective expected utility theory (SEU) (Edwards 1954), due to an important underlying assumption of the 'perceived value of HSPs' which see that consumers are rational decision makers who, either before or after the use of HSPs, assess the benefits of HSPs against the associated costs or barriers to maximise utility and so prefer behaviours which are associated with the highest expected utility.

External Cues to Action

In this study, 'external cues to action' was defined as an external event such as a mass media message, word-of-mouth, or advertising campaign that prompts health-related action.

The *logistic regression* analysis in the current study supported the view (formulated in Research Hypothesis 8) that consumers perceiving a higher level of 'external cues to action' tend to have a higher likelihood of purchasing an HSP. Indeed, based on the results from the *logistic regression*, the 'external cues to action' is the second most potent predictor of the likelihood of a consumer purchasing an HSP. These findings support the findings concerning the 'external cues to action' in the previous studies described in the literature.

The evidence showing the influence of the 'external cues to action' has been reported in previous CAM studies, even though most of those studies did not test the relative predictive power of this variable compared to the other variables. In a study of the

prevalence of CAM use among 325 patients attending a general hospital in Australia (Kristoffersen et al. 1997), one third of interview respondents reported that their decisions to use CAM had been based on recommendation by friends and family members. In this study, the word-of-mouth from friends and family members was the information source that users of CAM relied upon the most. Similarly, Breuner et al. (1998) in a survey on CAM use by homeless youth in the U.S.A. indicate that one of the main reason for using them was 'friends use CAM and recommend it'. On the other hand, although Astin (1998) in the national sample study in the U.S.A. did not test the concept of the 'external cues to action', he assumed that a large amount of unexplained variance in the reason for CAM use might have been attributed to the existence of the influence of 'important others'. Similarly, Sharma (1992) points out that referrals by family, friends and acquaintances have been shown to be particularly powerful factors which encourage people to seek out CAM practitioners. As Sharma demonstrated, it is personal recommendations that initially creates interest; and it is personal assurances from others that later encourage use.

Given the strong predictive power of the 'external cues to action' in the likelihood of a consumer purchasing an HSP in the current study, the understanding of relative importance of each influencer or information source given by those who had purchased any HSPs will have managerial implications. For example, these findings on the external cues to action can be of great importance to advertising managers in both developing effective communication channels and devising advertising strategies.

8.3.3 Research Question 3: Do age, gender, and education affect the likelihood of a consumer purchasing a Health Supplement Product?

Research Question 3 was specifically addressed by three research hypotheses ($H10_a$, $H10_b$, and $H10_c$). Socio-demographic variables are believed to relate to health actions primarily through their influences on individual perceptions (Becker 1974a). The findings regarding the effects of age, gender and education on the likelihood of a consumer purchasing a Health Supplement Product (HSP) are compared with those described in the previous Complementary and Alternative Medicine (CAM) studies.

Age

In this study, the *logistic regression* analysis supported the hypothesis that consumers in the age group of 35 to 44 years tend to have a higher likelihood of purchasing a Health Supplement Product (Research Hypothesis 10a).

The results regarding the age of patients most likely to use CAM have been conflicting in previous CAM studies. Some studies have shown that age did not differ between users and non-users of CAM (Astin 1998, Siahpush 1998, Berg and Arnetz 1998, Kristoffersen et al. 1997, McGregor and Peay 1996, Donnelly et al. 1985, Parker and Tupling 1977). Other studies have reported that consumers of CAM tended to be young (Begbie et al. 1996), 15-34 (MacLennan et al. 1996), 30-39 (Eisenberg et al. 1998, 1993), 30-49 (Lloyd et al. 1993), 35-54 (Easthope et al. 1999) and 41-60 years (Yates et al. 1993).

In previous studies, the results on age differences in relation to the use of CAM have been inconsistent, but more over many studies have included different age groupings or

categories in their studies, and it is therefore hard to generalise that certain age groups are more frequent users of CAM than other age groups. In addition, the interpretation of age differences identified in some studies requires caution. For example, Easthope et al. (1999), in the secondary data analysis of the characteristics of patients claiming acupuncture, indicated that the peak age for acupuncture claims were the age groups of '45-54' and '35-44' years. The issue is not addressed however as to whether the frequent use of acupuncture in these age groups is due to an age difference itself or whether the incidence of the illnesses sought for help using acupuncture is age-related.

A population-based study in South Australia (MacLennan et al. 1996), which included three categories of age (i.e. '15-34', '35-54', and '55+' years) in the study, has shown that the use of CAM was most common amongst the younger age group of 15-34. However, the current survey has shown that HSPs purchase was more common among people 35-54 years of age (in the propensity to purchase an HSP in the future) and 25-44 years of age (in the past experience with HSPs) than among those who are in other age groups. The peak age group was '35-44' years in both cases. These results support a nation-wide population-based study in the U.S.A. (Eisenberg et al. 1998), which showed that the use of CAM was significantly more common among people 35 to 49 years of age than among those who were younger or older.

Gender

In this study, the *logistic regression* analysis supported the hypothesis that women compared to men tend to have a higher likelihood of purchasing an HSP (Research Hypothesis 10b).

While gender difference with regard to CAM use has been the focus of many previous studies, there have also been inconsistent results. Some studies in Australia (Easthope et al. 1999, Kristoffersen et al. 1997, MacLennan et al. 1996, Lloyd et al. 1993), Canada (Kelner and Wellman 1997), Germany (Furnham and Kirkcaldy 1996), and the U.S.A. (Lerner and Kennedy 1992) have shown that more women than men are receptive to CAM. For example, a population-based study by MacLennan et al. (1996), which was very similar to the current study in terms of place (i.e. South Australia), target population (i.e. general population) and the type of CAM (i.e. health supplement products category), has shown that females used significantly more vitamins, herbal medicines, mineral supplements, homoeopathic remedies, and aromatherapy oils than males did.

The findings from the current study support the South Australian study (MacLennan et al. 1996). The current study has shown that more women than men reported that they had purchased HSPs in the past twelve months and that they were more likely to purchase an HSP in the next twelve months.

Contrary to the current research finding, other CAM studies in Australia (McGregor and Peay 1996, Begbie et al. 1996, Parker and Tupling 1977), the U.K. (Furnham et al. 1995, Vincent et al. 1995, Murray and Shepherd 1993), the U.S.A. (Astin 1998, Elder et al. 1997), and Sweden (Berg and Arnetz 1998) have shown that there was no significant difference between women and men with regard to CAM use.

The inconsistent results on gender difference may be explained by the differences in the types of CAM involved in the studies, or the variation in the geographical location in

the studies, or the different research methods used. For example, Kristoffersen et al. (1997), in an interview with 325 people visiting the emergency department of a general hospital, showed that there were statistically significant gender differences in consulting alternative therapists (i.e. women favoured naturopathy, aromatherapy, relaxation, iridology and reflexology, but there were no differences in homoeopathy, hypnotherapy, and chiropractic between women and men). Sharma (1992), using data from a series of European studies, showed that herbalism and homoeopathy were especially favoured by women, while massages and osteopathy were used relatively more by men. From these findings, gender differences might depend on the types of CAM.

Education

In this study, the *logistic regression* analysis did not support the hypothesis that consumers with a higher level of education tend to have a higher likelihood of purchasing a Health Supplement Product (Research Hypothesis 10c).

Several CAM studies on cancer patients reported that users of CAM therapies tended to be more highly educated (Downer et al. 1994, Lerner and Kennedy 1992, Cassileth et al. 1984), whereas Begbie et al. (1996) showed no significant difference in the level of education in relation to CAM use among their cancer patients. An absence of an interconnection between the level of education and CAM use has also been reported in some other studies (Siahpush 1998, Kristoffersen et al. 1997, Elder et al. 1997, McGregor and Peay 1996, Furnham and Kirkcaldy 1996, Furnham et al. 1995, Furnham and Forey 1994, Lloyd et al. 1993, Furnham and Bhagrath 1993, Donnelly et al. 1985).

Although it is very difficult to explain whether these inconsistent results on the education variable are due to different types of CAM, different locations of the study, or different research methods, some population-based studies reported that the users of CAM tended to have a higher level of education compared to the non-users. For example, Eisenberg et al. (1998, 1993) report that users of CAM tend to have more than some college education. Other population-based studies, which also targeted the general population but used different research methods (Oldendick et al. 2000, telephone interview, Astin 1998, mail survey, MacLennan et al. 1996, personal interview), have also found that a higher level of education was an indicator of the frequent use of CAM.

Contrary to these population-based CAM studies, the current study has demonstrated that there appeared to be no significant association between educational level and the likelihood of a consumer purchasing an HSP.

This result might be explained by two reasons. First, it is speculated that the purchase of HSPs (products) does not require a high level of education and thorough information search which might be needed to understand complex procedures and principles of the service form of CAMs. Second, in many cases the decision to purchase an HSP is influenced by external cues. Indeed, the *logistic regression* analysis of the survey has shown that the 'external cues to action' was the second strongest predictor in relation to the likelihood of a consumer purchasing an HSP. People may not need to actively study or search for information, since the information is easily available everywhere.

In summary, this section has discussed the results of the survey in comparison with research findings from other CAM studies described in the literature for each of the research questions. The next sections will discuss the academic and managerial

contributions of the current study as well as its limitations, together with possible directions for future study.

8.4 Academic Contributions

This study makes a significant contribution to knowledge in the areas of health-care marketing and health behaviour. These contributions relate to: (1) the development of a conceptual model in explaining and predicting the likelihood of a consumer purchasing a Health Supplement Product (HSP); (2) the empirical support for the proposed conceptual model; (3) the development of two new instruments; (4) the research focus on Health Supplement Products (i.e. the product type of Complementary and Alternative Medicine) rather than the service type; (5) the nation-wide general population study; and (6) the more rigorous two-stage research methodology compared to most previous CAM studies which have various methodological limitations due to the use of either qualitative or quantitative analysis alone.

The first academic contribution of this study stems from the development of a conceptual model in explaining and predicting the likelihood of a consumer purchasing an HSP. Despite the current increased popularity of and extensive research on CAM, few studies have proposed and empirically tested conceptual models. The existence of inconsistent results in CAM studies may be attributed to the fact that few studies attempted to use or develop theories to explain consumer behaviour in relation to CAM.

A review of the extant literature on CAM and the HBM studies has shown that although some of the personality traits and health beliefs variables were investigated, to date they have not been examined systematically and theoretically with regard to Health

Supplement Products. In addition, although a few researchers (Aspinwall et al. 1991, Hingson et al. 1990) have attempted to incorporate the possible influence of external cues into the HBM studies, the extent and the degree of investigation of the external cues were limited. A review of the literature in the areas of CAM studies has shown that only a single study (Brown and Segal 1996), which focused on the use of prescribed conventional medicines and home remedies among hypertension patients, used the HBM as a theoretical framework. However, Brown and Segal's (1996) study focused on the psychosocial elements of the HBM and did not look at the other variables such as the personality traits and the external cues to action. In the current study, a clear and coherent conceptual model of the likelihood of a consumer purchasing an HSP was proposed after conducting conceptual analyses of the preliminary qualitative research and literature review. The development of the proposed conceptual model was based on the HBM, but the conceptual model extended the HBM with the inclusion of the personality traits. Thus, this study makes a contribution by developing a conceptual model to explain and predict consumer purchase behaviour in relation to Health Supplement Products.

The second contribution of this study is the empirical support of the proposed conceptual model in explaining and predicting the likelihood of a consumer purchasing an HSP. While the proposed conceptual model correctly classified 62.7% of the survey respondents who had not showed any intention to purchase an HSP, the model correctly classified 88% of the respondents who showed an intention to purchase an HSP. The overall accuracy of classification (i.e. the weighted average of two values) in the proposed conceptual model was 79.9%. Although a single study cannot provide a sound basis for the conceptual model in explaining and predicting the likelihood of a consumer

purchasing an HSP, this study suggests that further studies incorporating the revised version of the conceptual model would be beneficial.

The third academic contribution stems from the development of two new instruments. One of the major reasons for inconsistent results in many previous CAM studies is attributed to the absence of universally accepted measurement instruments. A major aspect of this research was the development of two new measurement instruments with high internal reliabilities. The new instruments included 'perceived value of HSPs' and 'external cues to action'. They were developed from the findings from the preliminary qualitative study and an extensive and thorough literature review on CAM and the HBM studies. The *alpha* test at the pretesting and the resulting survey indicated that these two instruments were reliable and valid for the study. These instruments with a high internal consistency score could be used by marketing managers within the HSP industry who need to establish an effective marketing strategy, or by researchers who wish to carry out similar research to that described in this thesis. At a broader level, interested parties could use these instruments to develop measurements in other social sciences.

The fourth contribution emerges from the research focus on the product type of CAM (i.e. Health Supplement Products) rather than the service type. Although the intrinsic differences between products and services have been recognised and stressed in marketing research, the majority of population-based CAM studies have not attempted to separate the product forms of CAM from the service forms of CAM.

The fifth contribution stems from the nation-wide general population at which the current study was aimed. A study by MacLennan et al. (1996) has shown that there is a high usage of CAM among healthy people. However, the samples in the majority of CAM studies, except for a few national surveys (Eisenberg et al. 1998, 1993, MacLennan et al. 1996), were recruited from physicians' offices or CAM practitioners' clinics. Such research did not include healthy people, rather, it included patients with specific diseases: e.g. cancer (Begbie et al. 1996), hypertension (Brown and Segal 1996). Therefore, the application of the study results based on those with specific diseases to the general population was considered to be limited. On the other hand, population-based studies regarding CAM use did not use theories to test underlying research hypotheses, but rather focused on the descriptive analysis on the types of CAM used, the frequencies of CAM use, the socio-demographic variables, the cost of CAM and the reasons for using CAM. The current study makes a contribution by aiming at general adult Australians as its target population and by adopting a theoretical approach. Thus, the findings of the current study can be considered generalisable to Australian consumers of Health Supplement Products.

Finally, the academic contributions are derived from the methodology employed in the current study. This study involved a rigorous two-stage methodology: the first stage being the preliminary qualitative study and the second stage, the quantitative study. Given the design of this sequential methodological triangulation, the current study is the most comprehensive study of the determinants of one particular type of CAM (i.e. Health Supplement Products) purchase conducted to date.

8.5 Managerial Contributions

There are many parties which have an interest in understanding the determinants of consumer decision-making on the purchase of Health Supplement Products (HSPs). These include (1) marketers of HSPs; (2) health-care practitioners in both alternative and conventional medicine; and (3) health-care educators and policy makers.

First, because this research focused on HSPs, the findings are of particular value to marketers of HSPs. The marketers include both manufacturers and retailers such as pharmacies, health food stores, and supermarket management. The managerial contributions emerge from gaining a deeper understanding of potential customers by identifying the individual differences (e.g. personality traits, socio-demographic variables) and by understanding social cognitions of the individual buyer (e.g. consumers' perceptions of the value of HSPs, and consumers' perceptions of general health threats), which affect the likelihood of a consumer purchasing an HSP. This understanding can be of importance to marketing managers in building effective segmentation and targeting strategies. It is also relevant to advertising managers for the development of promotional themes and messages which appeal to potential consumers. The findings on the external cues to action can also be of value in devising advertising strategies. More generally, the results of this research may be of value to the services providers of Complementary and Alternative Medicine (CAM).

Second, the information regarding the factors affecting the likelihood of a consumer purchasing an HSP will provide value to both conventional and alternative health-care practitioners. In relation to conventional health-care practitioners, even though recent studies have shown that many conventional medical practitioners are interested in

integrating some type of CAM into their practices (Easthope et al. 1998, Easthope 1993), a high proportion of conventional medicine patients had not consulted with their medical doctors about their concurrent use of HSPs and prescription medicines (Kristoffersen et al. 1997, Sawyer et al. 1994). For example, Kristoffersen et al., in a study on the use of CAM products among patients presenting to an emergency department in a hospital, found that only 21% of patients had discussed CAM products which they had been using with their primary medical providers. It was also found that one major reason given for not telling medical practitioners about the use of CAM therapies was the perception that doctors would probably reject the therapies. Sawyer et al., in a study of HSPs use by children with cancer, also found that 57% of parents had not discussed the use of HSPs for their children with their doctors. Eliason et al. (1997) suggest that conventional health-care practitioners might not be adequately addressing preventive and wellness issues in discussions with their patients. By gaining an understanding of consumers' perceptions, attitudes toward HSPs and their unique characteristics, health-care practitioners may better understand patients' needs and wants and improve the communication with their patients.

Finally, health-care educators and health-care policy-makers could also benefit from the findings of this study. The findings of this study could be of use in the planning of educational programs or health policies. Although there have been many reports that natural Health Supplement Products are not always safe (Levy 1999b, Palmer 1998, Drew and Myers 1997, Thornton 1996, Pillans 1995), the evidence from this research reveals that consumers in general have a tendency to perceive HSPs as safe. This perception difference could enable healthcare educators and policy-makers to reconsider health-care education programs and policies.

The incidence of adverse effects of CAM products requires that more effective education programs for consumers are needed to help them make more informed and safe decisions. The education programs and new health-care policies should also encourage medical practitioners and pharmacists to routinely ask for information about CAM use among their patients whenever they obtain a history. It is also important to encourage CAM practitioners and consumers to report any adverse effects to CAM products, as a large proportion of these products are sold through health food outlets, supermarkets, pharmacies and by direct marketing (including via the Internet). The findings of this study could therefore enable healthcare educators and policy-makers to reconsider health-care education programs and policies.

8.6 Limitations of the Study

There were five main limitations arising from the research methods used. These are: (1) the cross-sectional research design; (2) the source of the sampling frame; (3) the measurement instruments; (4) the measurement of the expressed intention; and (5) the geographical coverage.

The first limitation was imposed by the cross-sectional design of the mail survey. This cross sectional study represented one point in time and did not reflect possible changes in perceptions, beliefs or behaviour over time. For example, if an individual were to experience a severe side effect from the use of a herbal remedy, this experience would have marked influences on her or his future attitudes towards the value of Health Supplement Products (HSPs). Further study employing a longitudinal design would ascertain whether the beliefs and perceptions found in the current study change over time.

The second limitation was derived from the fact that an electronic telephone directory database was used as the source of the sampling frame. This list is incomplete due to silent telephone numbers, households without a phone service, or those who rely on a mobile phone and it will also contain errors due to recent changes in address. Nevertheless, the use of the electronic telephone directory database was regarded as a legitimate option since the telephone directory is the only information source available to the researcher and the electronic telephone directory database provides more accurate information than the printed telephone directories.

The third limitation was that although the majority of the measurement instruments that were developed or modified were shown to have good psychometric properties, further refinement of the construct 'scientific health orientation' (e.g. by focusing more on medical science rather than science generally) and the 'health value' measures are needed due to relatively low internal consistencies. The need for reliable and valid measurement instruments is critical since the success of any future research agendas in Complementary and Alternative Medicine (CAM) studies or the health-care marketing is dependent on such reliable instruments being available.

The fourth limitation was that the purchase of Health Supplement Products was measured by an expressed purchase intention rather than by observing actual purchase behaviour. Since it was impossible to observe or measure actual purchase behaviours from national samples in the mail survey, the expressed behavioural intention was used as an alternative measurement to the actual behaviour. However the measurement of behavioural intention is frequently used in marketing and consumer research and the usefulness of information on intentions largely depends on how accurately the

intentions are measured (Shiffman and Kanuk 2000, Mullet and Karson 1985). The current study used only a single question item to measure an expressed general intention (i.e. likely to purchase/unlikely to purchase an HSP). More specific measurements employing several scale items would strengthen the relationship between intentions and actual behaviour.

Finally, the limitation was derived from the geographical location of the current study (i.e. Australia). Although the proposed conceptual model was found to be reliable and valid in explaining and predicting the likelihood of a consumer purchasing an HSP, further study in different countries could strengthen and validate the model's explanatory and predictive power.

The limitations of this study have led to numerous suggestions for future research. Further studies seeking to overcome these above-mentioned limitations would be of interest to academics and practitioners in this area.

8.7 Areas for Future Research

This section suggests six related areas of research where additional investigation could be fruitful.

First, as mentioned earlier in Section 5.2, since the current study used the cross-sectional design, it would be valuable to conduct a longitudinal study to see whether or not the variables and their relationships are consistent over time. Second, future research could refine the measurement instruments newly developed in the current study.

Thirdly, the current study was conducted only in Australia, and cross-cultural research would be valuable. It is assumed that there will be, to some degree, a difference in the factors affecting the use of Complementary and Alternative Medicine (CAM) between countries, since some type of CAM (e.g. acupuncture and Traditional Chinese Medicine) are not regarded as alternatives in a country such as China, where they originate. Such an orientation would allow for an examination of the generalisability of the results found in the current study. Furthermore, as Astin (1998) indicates, the use of CAM is closely related to cultural beliefs; therefore further research could be directed toward empirically examining the beliefs of people from different ethnic backgrounds in Australia. Australia is a multi-cultural society and immigrants from a diverse range of countries might have certain cultural beliefs about various types of CAM which may be traditional and mainstream medicine in their home countries. Murray and Rubel (1992) argue that some immigrants and culturally isolated groups in rural and inner-city areas continue to use the long-established practices of folk medicine with which they have become comfortable.

Fourth, the current research covered only Health Supplement Products. By using the same research design, future research could extend to examine the service type of CAM in order to determine if the variables and their relationships established in the current research are accurate for explaining and predicting consumer behaviour in relation to the use of the service types of CAM. If there are different variables or relationships involved in explaining and predicting consumer's use of CAM between the service types and the product types, then the stakeholder groups of the service types of CAM might wish to use different strategies for their purposes. As an alternative to the independent research design of either the product or the service forms of CAM, further

research could develop a comparative study design incorporating both the service and the product types CAM into one study. A conceptual model being developed from such a comparative research design would increase the generalisability of the application of the model across the product and the service forms of CAM.

Fifth, although this study looked at the personality traits which had emerged as important determinants from the analysis of the preliminary in-depth interviews and from the literature, there still is room to examine other personality trait inventories to see if there are other distinct personality traits which may affect consumers' purchasing behaviour regarding HSPs or CAM.

Finally, a more detailed study of consumer responses to each of the different types of HSP (i.e. vitamins, minerals, herbal remedies, naturopathic medicines, homoeopathic preparations, aromatherapy products, and nutritional supplements) is an area for future research.

8.8 Conclusion

This final chapter of the thesis has reviewed the findings of the study and concluded that: (1) the personality traits of 'holistic orientation', 'internal health locus of control' and 'openness to experience' were positively related to the consumers' perceptions of the value of Health Supplement Products (HSPs) and 'scientific health orientation' was negatively related to the consumers' perceptions of the value of HSPs; (2) the determinants of the likelihood of a consumer purchasing a Health Supplement Product were consumers' perceptions of the value of HSPs and the influence of external cues; (3) women in the age group of '35-44' years showed a higher likelihood of purchasing an HSP, but the level of education did not show any influence on the likelihood of a consumer purchasing an HSP; (4) there was a positive quadratic (∪) relationship between 'perceived general health threats' and the likelihood of a consumer purchasing an HSP. This means that if consumers perceive the general health threat as either minor or severe, they are more likely to purchase an HSP, but this trend declines if levels of the 'perceived general health threats' are moderate; and (5) the effects of the personality traits on the likelihood of a consumer purchasing an HSP were considered to be mediated through consumers' perceptions of the value of HSPs as shown in the conceptual framework.

This study makes useful academic contributions to the areas of health-care marketing and health behaviour. These contributions relate to the development of a conceptual model capable of explaining and predicting consumers' HSP purchase behaviour, the empirical support for the proposed conceptual model, and the development of two new measurement instruments with high reliabilities.

The findings and conclusions of this research also have implications for manufacturers and retailers of HSPs, marketing managers of HSPs, health-care practitioners in both alternative and conventional medicine, health-care educators, and policy-makers. These relate to obtaining a better understanding of what factors affect consumers' HSPs purchase behaviour.

As with any study in an applied and under-researched area such as consumer purchase behaviour on CAM, there are, inevitably, a number of limitations. Most of these shortcomings emanate from the limitations imposed on the scope of the study as part of the empirical research design. This provides opportunities for future studies in this fertile field.

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Appendix I: Definitions of Key Terms

Health Supplement Products

The new term, 'Health Supplement Products', was coined by the researcher to use in this thesis. A Health Supplement Product (HSP), the main focus of this thesis, is defined as the product type of Complementary and Alternative Medicine (CAM) used as self-treatment for the purpose of maintaining and promoting health. From a marketing perspective, CAM can be divided into either tangible *products* (or *goods*) or intangible *service*. For example, herbal, aromatic and homoeopathy remedies are tangible (*products*), and chiropractic, massages, acupuncture and osteopathy are intangible (*services*). Health Supplement Products (HSPs) include vitamins, minerals, herbal remedies, homoeopathic preparations, and other health related products which may be sold in pharmacies, health product shops, or by homoeopaths, naturopaths, herbalists etc. Thus, it differs from CAM in that it excludes services.

HSPs are very close to the Over The Counter (OTC) medicines, in the sense that OTC medicines also take *goods* form, and that HSPs do not require prescriptions to acquire, but can be purchased from pharmacies, supermarkets and health food shops shelves, like OTC medicines. However, there are also dissimilarities between OTC medicines and HSPs. A distinct difference is that the OTC medicines can make a claim about their efficacy on the package label or through advertising, but HSPs cannot. For example, under the Australian Therapeutic Goods Administration (TGA), medicines are divided into either Registered Medicines or Listed Medicines (Medicines Definitions 2000). While Registered Medicines include prescription and non-prescription conventional medicines, HSPs are classified into Listed Medicines.

Dietary Supplement

'Dietary Supplement' is a commonly used term, but it has a broader meaning. According to the definition of the Dietary Supplement Health and Education Act 1994 (DSHEA, in the U.S.A.) (Mason 1998), dietary supplements are defined as "any product which contains one or more dietary ingredients such as vitamins, minerals, herbs or other botanicals, amino acids, or other ingredients used to supplement the diet." For example, dietary supplements encompass a broad range of products, including herbal remedies, botanicals, mega-dose vitamins, minerals, metalloids, hormones, proteins, amino acids, oils, microorganisms, and traditional cultural remedies. However, homoeopathic remedies are not included in the category of dietary supplements. The word of "dietary" in dietary supplement has a flavour of emphasising nutritional values rather than treatment of symptoms or health promotion. The DSHEA allows dietary supplements to carry "statements of nutrition support" on labels, but a supplement cannot make a direct drug claim (Mason 1998).

Nutraceuticals

'Nutraceuticals', a term which was coined by DeFelice (1997), is referred to "foods, dietary supplements, botanical extracts and medical foods that have a health-medical benefit including the prevention or treatment of disease." Nutraceuticals include a broad array of products ranging from isolated nutrients, dietary supplements, and diets to genetically engineered designer foods, herbal products, medical foods, and processed foods such as cereals, soups, and beverages. Although some categories of Nutraceuticals are very similar to those of HSPs, such categories of medical and processed food are not included in the categories of HSPs.

Complementary and Alternative Medicine (CAM)

Some researchers have attempted to define CAM in a broad sense, meaning the whole system of CAM.

Eisenberg et al. (1993) defined CAM as

"therapies that are not generally taught in American medical schools or provided in hospitals, that lack evidence of effectiveness, and that are not reimbursed by third party payers."

Similarly, Sampson and McKee (1995) defined

"CAMs are philosophies or approaches that fall out of the mainstream of Western medical practice, often those not backed by the scientific method of scrutiny".

However, these definitions are not necessarily still relevant. First, many medical schools have recently started incorporating CAM subjects or courses into their school curricula (Carlston 1998, Wetzel et al. 1998, Das 1997, Rampes 1997). Second, some health insurance companies are now reimbursing the insurer's claim on some type of CAM (Pelletier et al. 1999, Greenwald 1999, Hamilton 1996). Third, chiropractic and acupuncture, once considered as alternative, are now becoming perceived as mainstream medicine. Easthope et al. (1998) showed that about 15% of general practitioners in Australia presented Medicare claims for acupuncture in 1996 and the amount of Medicare reimbursements to doctors for acupuncture reached at A$17.7 million.

More recently, Zollman and Vickers (1999) defined CAM as:

" ... a broad domain of healing resources that encompasses all health systems, modalities and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health systems of a particular society or culture in a given historical period."

In some countries, some type of CAM such as acupuncture and herbal remedies are not alternative but regarded as mainstream and traditional medicine. In addition, from a historical point of view, before the emergence of scientific based conventional medicine, many types of CAM were also the mainstream medicine in almost any society. From this point of view, although Zollman and Vickers' definition seems to have somewhat abstract and broader meanings, it seems to be more preferable than the previous definitions on CAM.

There appear many other similar terms implying CAM in the literature. Table A-1 shows these similar terms of CAM with their citations.

Table A-1 Other Similar Terms of CAM Used in the Literature

Terms	Literature
Alternative Medicine(s)*	Kranz (1998), Verhoef (1995)
Complementary Medicine(s)*	Bensoussan (1999)
(W)holistic Medicine*	Deliman et al. (1982), Williams (1998)
Mind-Body Medicine*	Benjamin et al. (1997), Hagland (1993)
Unorthodox	Kronenfeld et al. (1982)
Non-conventional	Bernstein (1997), Amoils (1993)
Non-traditional	Caldwell (1999), Newell et al. (2000)
Marginal Medicine	Wallis and Morley (1976)
Fringe Medicine	Inglis (1964)
Folk Medicine	Bakx (1991)
Tender/Soft Medicine	Joyce (1994)
Natural	Crone (2000), Schneider (2000)

* Most widely used terms in the literature

The denotation of 'Alternative Medicine' describes and suggests a medicine used *instead of* conventional medicine. For example, consumers may use a herbal remedy such as Saint John's Wort for mental depression instead of Prozac™, a conventional prescription antidepressant. In another case, consumers may decide to see an acupuncturist for his/her pain relief rather than visit a general practitioner and take prescribed analgesics. In these two cases, there seems to be no opposition in the use of

term 'alternative medicine' for St' John's Wort and acupuncture as they were used as 'alternative' to the other conventional treatments.

On the other hand, the denotation of 'Complementary Medicine' refers to a medicine or therapy used *in conjunction with* conventional medicine. Gordon (1996) stresses that the term 'alternative' has a mild oppositional flavour in that it calls attention to what is not being offered by conventional physicians and the conventional medical system.

(W)holistic Medicine

'(W)holistic Medicine' gets its name from the Greek word *holos,* meaning "whole" (Goode 1996). The word holism was coined in the early nineteenth century to denote an approach that addressed the uniqueness of each individual and that sought to understand whole people in their total environments. It employs a wide range of conventional and alternative therapies (Gordon 1996), and does not solely mean alternative therapies nor exclude conventional medicine.

Mind-Body Medicine

'Mind-Body Medicine' stresses the inseparability of mind and body, and this approach emphasises techniques such as such biofeedback, meditation and visual imagery, which mobilise the mind to affect both itself and the body (Gordon 1996). The term Mind-Body Medicine appeared in the articles of Benjamin et al. (1997) and Hagland (1993).

Traditional Medicine

The term 'Traditional Medicine' is ambiguous, since it is sometimes used to mean Western or modern scientific medicine but sometimes describes primitive, empirical, prescientific practices, often having mystical and ideological bases in some countries

(Sampson and McKee 1995). The word 'traditional' can be found in the sentence defining Complementary Medicines in the Therapeutic Goods Administration (Medicines Definitions 2000).

> *"Complementary medicines (also known as 'traditional' or 'alternative' medicines) include ....."*

Other Similar Terms

In some countries, a certain term has widespread usage over the other terms. For example, *Nicht-Schulmedizen* (i.e. that which is not taught in medical school) is a preferred term in Germany, whereas 'Tender Medicine' known as *médicines douces* is very popular in France (Stambolovic 1996, Joyce 1994). 'Marginal Medicine' (Wallis and Morley 1976), 'Fringe Medicine' (Inglis 1964), 'Folk Medicine' (Bakx 1991), and 'Natural Medicine' (Crone 2000, Schneider 2000) have been interchangeably used with CAM. In contrast to the above-mentioned terms suggesting CAM, such terms as 'Orthodox Medicine', 'Biomedicine', 'Cosmopolitan Medicine', 'Western Medicine' and 'Allopathic Medicine' have been sometimes interchangeably used to mean conventional scientific medicine (Sharma 1992).

Classification of CAM

CAM takes many different forms of therapies. It encompasses Acupuncture, Aromatherapy, Chiropractic, Herbal Botanical Medicine (Phytomedicine), Homoeopathy, Iridology, Naturopathy, Osteopathy, Reflexology, and Shiatsu. However, sometimes the boundaries are not clear, making the classification of CAM difficult. To assist people's understanding of various procedures and techniques of CAM, the Office of Alternative Medicine (OAM) of National Institute of Health (NIH) in the U.S.A. has grouped CAM into several categories (refer Table A-2).

Table A-2 Classification of Complementary and Alternative Medicine

1. Mind-body Interventions
refer to the interest in the mind's role in the cause and course of illness. Mind-body interventions often help patients experience and express illness in new, clearer ways. The placebo response is one of the most widely known examples of mind-body interaction. Psychotherapy, support groups, meditation and imagery, hypnosis and hypnotic suggestions, biofeedback, yoga, dance/movement therapy, music therapy, art therapy, prayer, and mental healing are examples of these therapies.
2. Bioelectromagnetic applications in medicine (BEM)
is an emerging science that studies how living organisms interact with electromagnetic fields. The most important BEM modalities in alternative medicine are nonthermal applications of nonionizing radiation. Major new applications of nonthermal, nonionizing BEM fields are bone repair, nerve stimulation, wound healing, treatment of osteoarthritis, electroacupuncture, tissue regeneration, and immune system.
3. Traditional and folk medicine
is a category that includes traditional oriental medicine (acupuncture, herbal medicine, acupressure, gigong, and oriental massage), Ayurveda which includes lifestyle interventions (meditation and yoga), natural therapies, and herbal preparations, Homoeopathic medicine, Naturopathic medicine, and Environmental medicine.
4. Manual healing methods
are based on the concept that dysfunction of a part of the body affects secondarily the function of other discrete, not necessarily directly connected body parts. They include chiropractic therapy, Massage therapy, and Biofield therapeutics (healing touch, therapeutic touch and shen therapy).
5. Pharmacological and biological treatments
refers to the use of an assortment of drugs and vaccines not yet accepted by mainstream medicine, including antineoplastons, cartilage products, ethylene diamine tetracetic acid (EDTA), immunoagumentive therapy, coleys toxins, neural therapy, apitherapy, iscador, and biologically guided chemotherapy.
6. Herbal medicine
includes the use of plants and plants products found in the folk medicine traditions found in all cultures.
7. Diet and nutrition in the prevention and treatment of chronic disease
includes orthomolecular medicine which is the therapeutic use of high-dose vitamins to treat chronic disease. It promotes improving health and treating disease by using the optimum concentration of substances normally present in the body.

Source: Major Domains of Complementary and Alternative Medicine (2001). National Institute for Complementary and Alternative Medicine, http:/nccam.nih.gov/nccam/fcp/classify/, Access Date: 15 Jan, 2001

Appendix II: Studies of Using the Health Belief Model

Preventive Health Behaviours	
Preventive health decision	Lai et al. (2000)
Self-care	Haug et al. (1991)
Dieting and exercise	Aho (1979), Becker et al. (1977)
Breast self-examination	Champion (1992), Calnan and Rutter (1986), Mamon et al. (1986)
HIV/AID preventive	Smith and Stasson (2000), Manu and Sriram (1999), Steers et al. (1996)
Weight management	Parham (1993)
Immunisation	Bodenheimer et al. (1986), Cummings et al. (1979), Oliver and Berger (1979)
Contraceptive use	Keith et al. (1991), Herold (1983)
Screening for hypertension	Wieck (1997), King (1982)
Screening of cancer	Clasen et al. (1994)
Screening breast cancer	Fulton et al. (1991), Rutledge et al. (1988)
Food safety behaviour	Schafer et al. (1993)
Sick Role Behaviours	
Compliance with medical regimens	Feigelman et al. (1993), Alogna (1980), Bloom-Cerkoney et al. (1980), Ludvigsson et al. (1980)
Others	
Drinking driving	Gotthoffer (1999), Beck (1981)
Smoking behaviour	Lindsay and Rainey (1997), Knight and Hay (1989)
Bicycle safety helmets use	Witte et al. (1993)

Appendix III: Covering Letter of the In-Depth Interview

11 Jan, 2000

Dear Sir/Madam,

Re: Post-Graduate Research - Request for Interview

I would like to take a few moments of your time to introduce myself and the purpose of this letter.
My name is Seong Sam Yang and I am enrolled as a Ph.D. student at the University of Wollongong, from which I graduated in 1998 with an MBA in International Business Management. As a Ph.D. student, I am conducting a research project entitled ***"A Study of Consumer Decision-Making on Alternative Medicines"***. This research is being conducted in the Department of Marketing within the Faculty of Commerce at the University of Wollongong.

I am approaching you to request your participation in an interview, which I am conducting as part of my research. The purpose of interviewing you and others is to understand as to how people make sense of, and obtain information about on Alternative Medicines. The variables identified from the interviews will be used to formulate hypotheses, which will be incorporated into a questionnaire for a subsequent quantitative study.

The proposed interview would be along the following lines. I will interview you on one-to-one basis at a location suitable for you. The interview will take about forty-five minutes. With your permission, the interview would be recorded to enable me to analyse the data at a later stage. The interview would be kept strictly confidential, in order to protect your privacy. Excerpts of interviews may be referred to or cited in the final research report, but under no circumstances would your name or any other identifying characteristics be disclosed. Your participation in this research would, of course, be entirely voluntary.

If you would like any further information regarding my research project, please feel free to contact me (Tel. 4227-5818), my academic supervisors, Associate Professor Paul Couchman (Tel. 4221- 4681) and Dr. Lesley White (Tel. 4221-4052), or the Secretary of the University of Wollongong Human Research Ethics Committee (Tel. 4221-4457).

If you were to kindly agree to be interviewed, you would be making an extremely valuable an important input into my research. I look forward to your response and to the opportunity of meeting you in person. Should you be unable to assist me with my research, I would like to take this opportunity to thank you for your kind attention to my request and to wish you well.

Yours Sincerely,

Seong Sam Yang (Ph. D. Candidate)
M.B.A., M. Pharm., B. Pharm.

Appendix IV: Interview Consent Form

University of Wollongong Interview Consent Form

A Study of Consumer Decision-Making on Alternative Medicines

By Seong Sam Yang

This preliminary qualitative research (in-depth interviews) is being conducted as part of a PhD degree supervised by Associate Professor Paul Couchman and Dr. Lesley White in the Department of Marketing at the University of Wollongong.

The purpose of interviewing you and others is to understand as to how general public make sense of, and obtain information about, Alternative Medicines. The variables identified from the information collected in the interviews will be used to formulate relevant hypotheses, which will be incorporated into a questionnaire to be used for a subsequent survey.

Your participation in this research is voluntary. You are free to refuse to participate and you are free to withdraw from the research at any time. Your refusal to participate or withdrawal of consent will not affect your relationship with the Department of Marketing or your relationship with the University of Wollongong.

If you would like to discuss this research further please contact Seong Sam Yang (the researcher) on 4227-5818, or Associate Professor Paul Couchman on 4221-4681 and Dr. Lesley White on 4221- 4052. If you have any enquiries regarding the conduct of this research, please contact the Secretary of the University of Wollongong Human Ethics Committee on 4221-4457.

Research Title: A Study of Consumer Decision-Making on Alternative Medicines

I, _____ consent to participate in the research conducted by Seong Sam Yang as it has been described to me in the information sheet. I understand that the data collected will be used to/for formulating research hypotheses and incorporated into a questionnaire for the subsequent quantitative study and I consent for the data to be used in that manner.

Signed *Date*

_____ ____/____/2000

Appendix V: Interview Guide

1. General questions on health

1.1 Do you ever think about your health?
1.2 Do you do anything to maintain or promote your health?
1.3 Where do you get your information about health related issues?
1.4 When you read or hear about health related issues, what comes to your mind first?
1.5 What are the main causes of illness?
1.6 Who are responsible for the illness?
1.7 Who do you think handle your health very well?
1.8 To what degree you can handle your health?

2. Use, Knowledge, Attitudes, Perceptions and Experience

2.1 What do you know about alternative medicine?
2.2 Have you ever used or are you now using any types of alternative medicine?

-- Experience--

a. What types of alternative medicine have you used or are you now using?
b. What has been your experience with alternative medicine?
Why use it? Why did you use it?
c. How satisfied are you with CAM?
d. What factors do you think contribute to the continued use of CAM?
e. Where do you go for an advice and/or information on alternative medicine?

-- No experience--

a. Are there any particular reasons why you have not used CAM?
b. Have you heard or read about the other people's experience on CAM?" or
c. Why do you think people use CAM?

2.3 How effective, in your opinion, is alternative medicine?
2.4 Do you have any discrimination by the types of CAM?
2.5 What ways do you think CAM differs from CM?
2.6 What is (dis)advantage of CAM vs CM?

3. ETC

3.1 If you develop signs or symptoms, which you are not familiar with, what steps or actions would like to take to reduce symptoms or signs?
3.2 Why do you think CAM has been popular in Australia?

Appendix VI: The HREC Research Approval Letters

University of Wollongong

Office of Research

University of Wollongong
NSW 2522 Australia

Tel (02) 4221 3386
Fax (02) 4221 4338
International 61 2+
Email office_research@uow.edu.au

http://www.uow.edu.au

APPROVED
In reply please quote: CT:JDR HE99/242
Further Information: Julie Dalla-Riva (PH: 42214457)

15 December 1999

Mr Seong Sam Yang
16/4 Fisher Street
West Wollongong NSW 2500

Dear Mr Yang,

I am pleased to advise that the following Human Research Ethics application has been approved. Please note, however, that in response to condition 2, the Committee prefers that, wherever possible, initial contact with prospective participants be by a notice or announcement in order to avoid any pressure to participate that can otherwise occur. Accordingly, a notice that informs university students and staff about the research is the preferred initial contact for participants to respond to the investigator.

Ethics Number:	HE 99/242
Project Title:	"The study of consumer decision-making on alternative medicine (A Market Approach)"
Name of Researchers:	Mr S. Yang
Approval Date:	9 December 1999
Duration of Clearance:	8 December 2000

This certificate relates to the research protocol submitted in your application of 1 December 1999. It will be necessary to inform the Committee of any changes to the research protocol and seek clearance in such an event.

Please note that experiments of long duration must be reviewed annually by the Committee and it will be necessary for you to apply for renewal of this application if experimentation is to continue beyond one year.

Associate Professor Colin Thomson
Chairperson
Human Research Ethics Committee

cc. Head, Department of Marketing

University of Wollongong

RENEWAL
In reply please quote: SD:KM HE99/242
Further Enquiries: Karen McRae (PH: 42214457)

Good Universities Guides
AUSTRALIA'S UNIVERSITY OF THE YEAR
Preparing Graduates for the e-World — Joint Winner **2000-2001**
Outstanding R&D Partnerships — Joint Winner **1999-2000**

17 September 2001

Mr S.S. Yang
16/4 Fisher Street
West Wollongong NSW 2500

Dear Mr Yang,

I am pleased to advise that **renewal** of the following Human Research Ethics application has been **approved**. As a condition of approval, the Human Research Ethics Committee requires that researchers immediately report anything which might warrant review of ethical approval of the protocol, including: serious or unexpected adverse effects on participants, proposed changes to the protocol, unforseen events that might affect continued ethical acceptability of the project and discontinuation of the research project before the expected date of completion.

Ethics Number:	HE99/242
Project Title:	The study of consumer decision-making on alternative medicine (A Market Approach)
Name of Researchers:	Mr S.S. Yang
Approval Date:	13 September 2001
Duration of Clearance:	12 September 2002

Please note that experiments of long duration must be reviewed annually by the Committee and it will be necessary for you to apply for renewal of this application if experimentation is to continue beyond one year.

Karen McRae for

Assoc. Prof. Colin Thomson
Chairperson, Human Research Ethics Committee

* The letter needs to state, how participants were selected, ie randomly from telephone directory and that research project has been "reviewed by the HREC".

Office of Research University of Wollongong NSW 2522 Australia
Telephone: (61 2) 4221 3386 **Facsimile:** (61 2) 4221 4338
office research@uow.edu.au www.uow.edu.au

Appendix VII: Findings of The In-Depth Interviews

Table A7-1. CAM Experience by Socio-demographics of the Interview Respondents

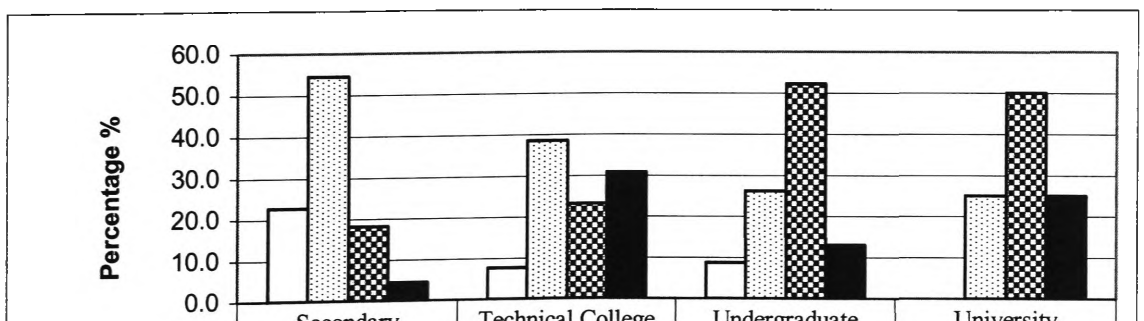
Gender	Never Used	%	1-2 Used	%	3-4 Used	%	> 5 Used	%	Total	%
Female	4	12	10	29	13	38	7	21	34	52
Male	4	13	15	47	10	31	3	9	32	48
Total	8	12	25	38	23	35	10	15	66	

Age	Never Used	%	1-2 Used	%	3-4 Used	%	> 5 Used	%	Total	%
18-24	2	25	3	38	3	38	0	0	8	12
25-34	2	14	5	36	3	21	4	29	14	21
35-44	3	20	9	60	2	13	1	7	15	23
45-54	0	0	4	29	6	43	4	29	14	21
55-64	1	13	2	25	4	50	1	13	8	12
65>	0	0	2	29	5	71	0	0	7	11
Total	8	12	25	38	23	35	10	15	66	

Education	Never Used	%	1-2 Used	%	3-4 Used	%	> 5 Used	%	Total	%
Secondary	5	23	12	55	4	18	1	5	22	33
Technical College	1	8	5	38	3	23	4	31	13	20
Undergraduate	2	9	6	26	12	52	3	13	23	35
University	0	0	2	25	4	50	2	25	8	12
Total	8	12	25	38	23	35	10	15	66	

Note: CAM = Complementary and Alternative Medicine

Table A7-2. CAM Experience by Education



	Secondary	Technical College	Undergraduate	University
Never Used	22.7	7.7	8.7	0.0
1-2 Used	54.5	38.5	26.1	25.0
3-4 Used	18.2	23.1	52.2	50.0
> 5 Used	4.5	30.8	13.0	25.0

Table A7-3. Degree of CAM Experiences by Frequency

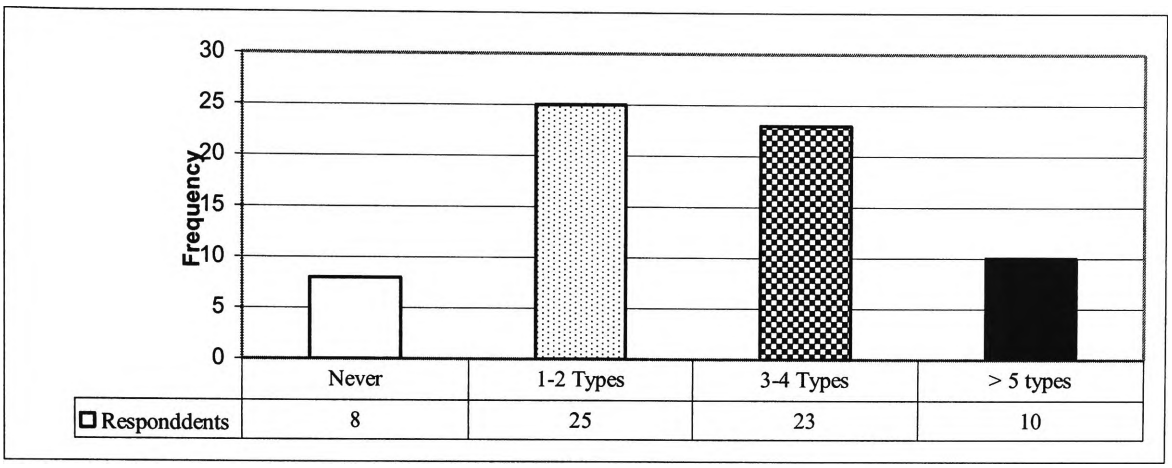


Table A7-4. Degree of CAM Experiences by Percentage

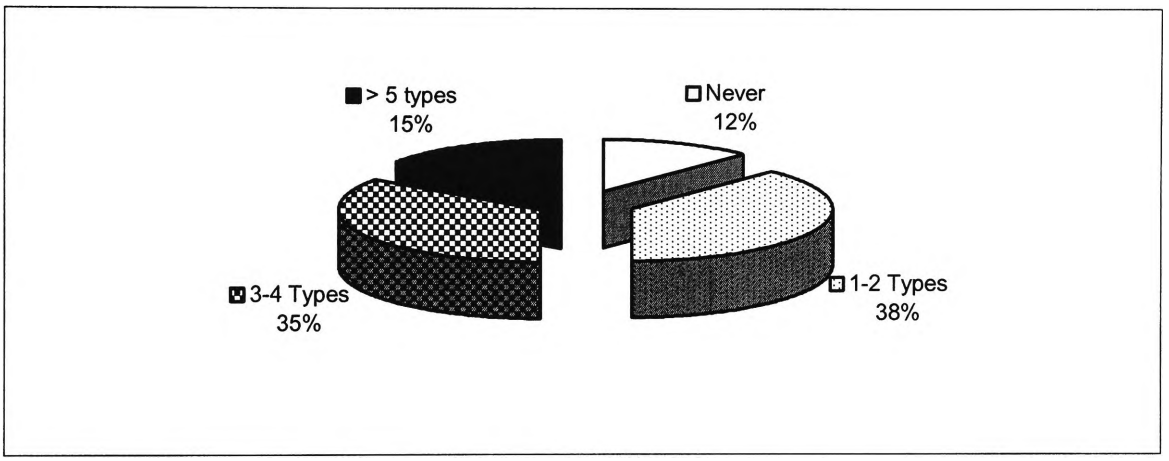
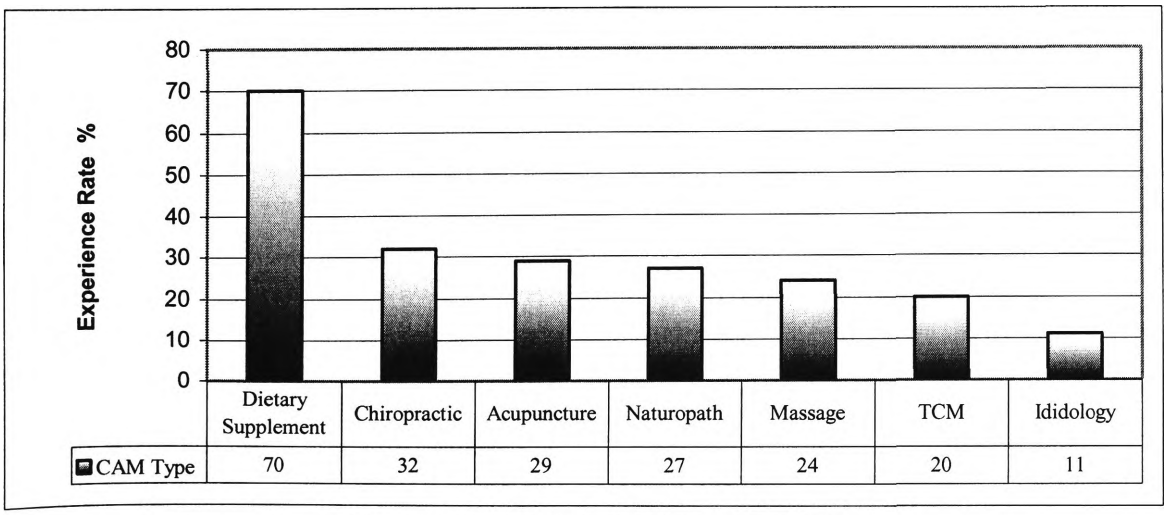
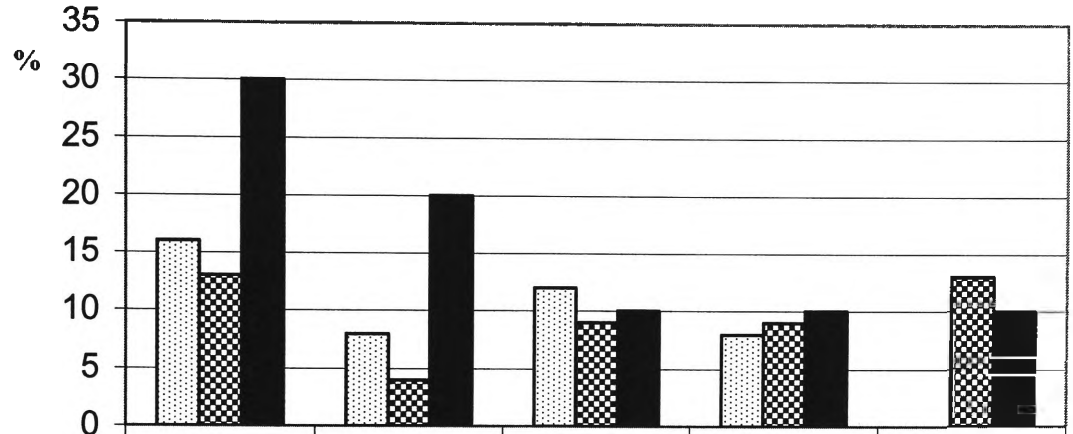


Table A7-5. Degree of CAM Experiences by Types of CAM



Note: TCM = Traditional Chinese Medicine

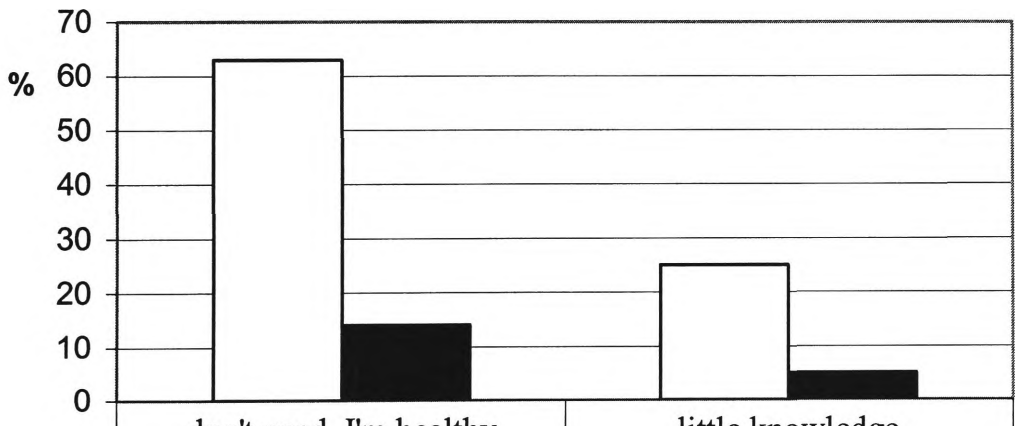
Table A7-6. Reasons for Using Complementary and Alternative Medicine



	negative outcomes of CM	limitations of CM	recommended by others	natural, no side effect	openness
1-2 types	16	8	12	8	0
3-4 types	13	4	9	9	13
>5 types	30	20	10	10	10

Note: CAM= Complementary and Alternative Medicine CM= Conventional Medicine

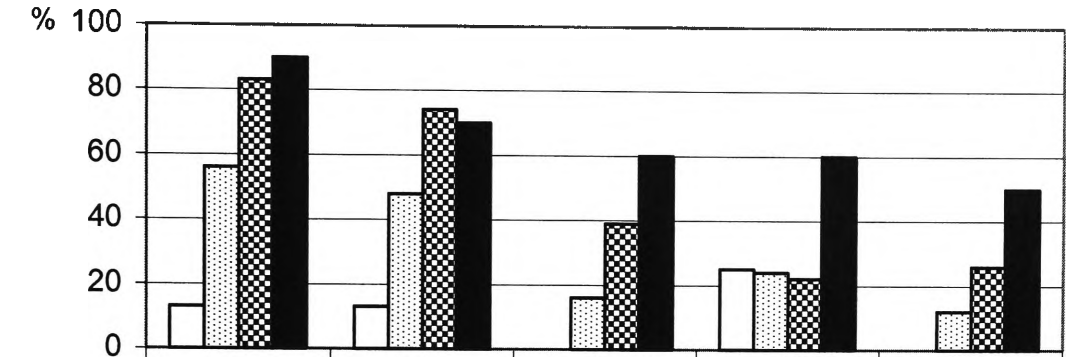
Table A7-7. Reasons for Not Using Complementary and Alternative Medicine



	don't need, I'm healthy	little knowledge
never	63	25
1 > types	14	5

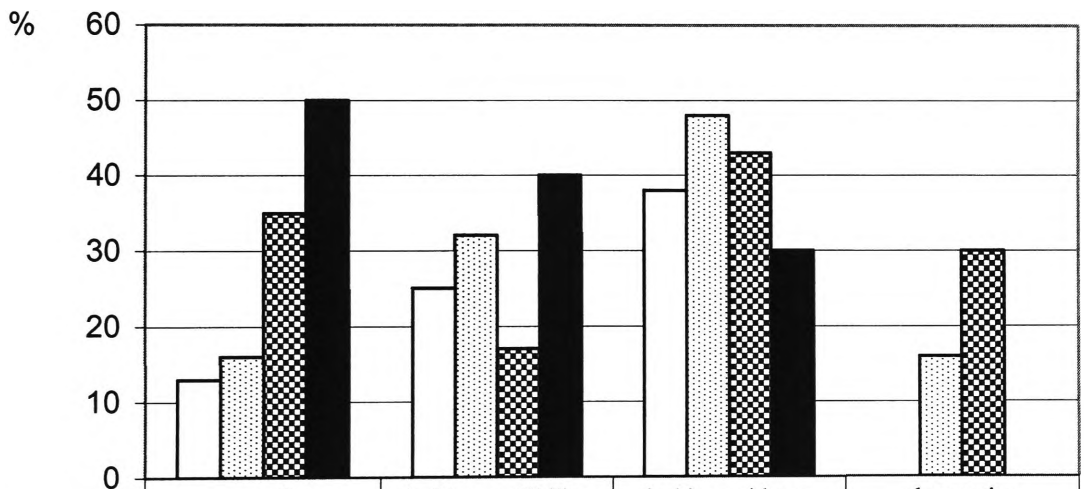
Appendix VII: Findings of The In-Depth Interviews (Continued)

Table A7-8. Perceptions on Positive Aspects of CAM



	effectiveness	safe, do not harm	emotionally good	holistic approach	control, responsibility
never	13	13	0	25	0
1-2 types	56	48	16	24	12
3-4 types	83	74	39	22	26
>5 types	90	70	60	60	50

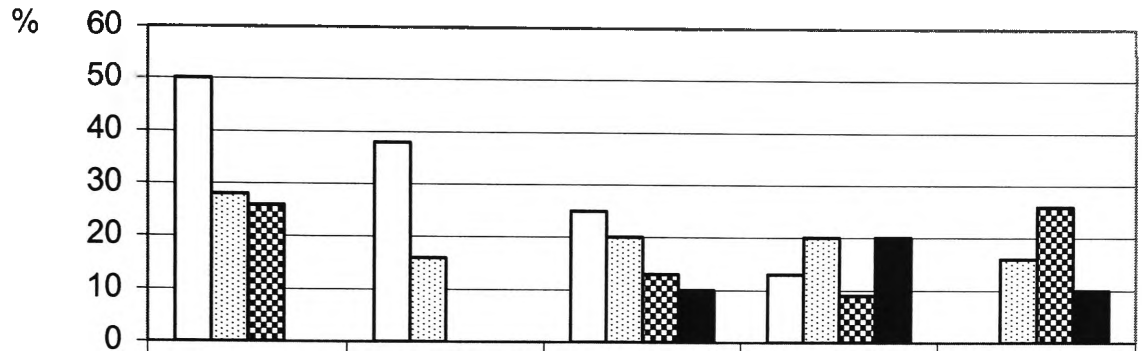
Table A7-9. Perceptions of Negative Aspects of CAM



	expensive	lacking credibility	lacking evidence	slow action
never	13	25	38	0
1-2 types	16	32	48	16
3-4 types	35	17	43	30
>5 types	50	40	30	0

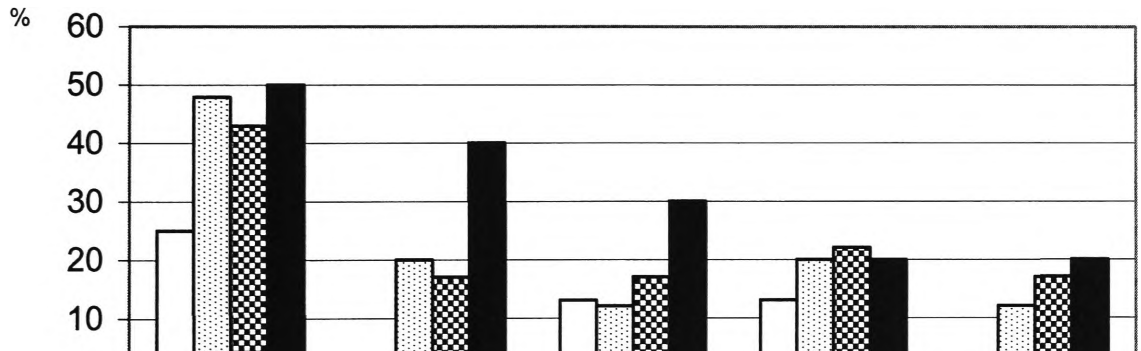
Appendix VII: Findings of The In-Depth Interviews (Continued)

Table A7-10. Perceptions of Positive Aspects of Conventional Medicine



	trustworthy doctors	convenience	scientific evidence	legimate, accepted	effective, good diagnosis
never	50	38	25	13	0
1-2 types	28	16	20	20	16
3-4 types	26	0	13	9	26
>5 types	0	0	10	20	10

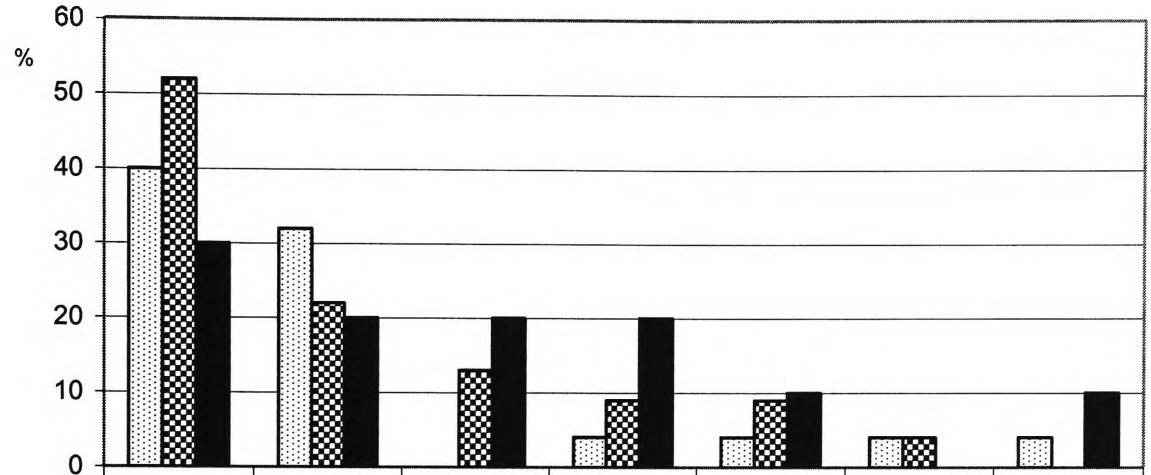
Table A7-11. Perceptions of Negative Aspects of Conventional Medicine



	negative outcomes	untrustworthy CM professionals	lack of communication	narrow mindedness	impersonal, mechanical
never	25	0	13	13	0
1-2 types	48	20	12	20	12
3-4 types	43	17	17	22	17
>5 types	50	40	30	20	20

Note: CM= Conventional Medicine

Table A7-12. Reasons for Continued Use of CAM



	effectiveness	emotionally good	understanding AM principles	took a course	need knowledge	commercial influence	cost
1-2 types	40	32	0	4	4	4	4
3-4 types	52	22	13	9	9	4	0
>5 types	30	20	20	20	10	0	10

Note: AM = Alternative Medicine (i.e. Complementary and Alternative Medicine)

Appendix VIII: Covering Letter of the Mail Survey

5th Nov, 2001

Dear Sir/Madam,

Invitation to Take Part in a Survey

I am a PhD student in the Department of Marketing at the University of Wollongong and I am conducting a study on how consumers make decisions about health supplement products.

I am writing to ask you to take part in this study. The study is designed to gain a better understanding of what influences consumers when they make decisions to buy health supplement products. If you agree to take part, then simply complete the attached questionnaire and return it in the self-addressed envelope I have provided. This should only take you about **10 to 15 minutes**.

The information I collect from the survey will be kept **strictly confidential**, in order to protect your privacy. The information collected from all the returned questionnaires will be presented as statistics, and under no circumstances will individual respondents be identified. The results of the survey will be used for **academic purposes only** (i.e. as part of my PhD thesis and in academic publications).

This research project has been approved by the Human Research Ethics Committee at the University of Wollongong. Only a small sample of the Australian population has been randomly selected from telephone directories for this survey. If you agree to take part it would make a very valuable contribution to my research. The questionnaire is numbered to enable me to follow up recipients who do not reply. No one else but me will have access to that number.

To reward you for your time and trouble, I will send you a $3 "scratchie" (i.e. instant scratchie lottery ticket) when you return your completed questionnaire.

If you would like any further information about my study, please feel free to contact me (by telephone at 02-4221-3377 or by E-mail at ssy03@uow.edu.au), or my supervisors Associate Professor Paul K. Couchman (by telephone at 02-4221- 4052) and Associate Professor Lesley White (by telephone at 02-9850-8230).

Thank you for your time and, if you agree to help me, I look forward to receiving your questionnaire.

Yours Sincerely,

Seong Sam Yang (Ph. D. Candidate)
M.B.A., M. Pharm., B. Pharm.

Appendix IX: Reminder Letter of the Mail Survey

15th Nov, 2001

Dear Sir/Madam,

Invitation to Take Part in a Survey: Reminder Letter

I am a PhD student in the Department of Marketing at the University of Wollongong and am conducting a study on how consumers make decisions about health supplement products.

About one week ago, I sent you a survey form, "Consumer Survey on Health Supplement Products", which is designed for me to gain a better understanding of what influences consumers when they make decisions to buy health supplement products.

If you have already returned the survey form, please accept my sincere **thanks** and discard this mail. **If not, please complete** the attached survey form and return it with the enclosed self-addressed envelope today. This should only take you about **10 to 15 minutes**.

The information I collect from the survey will be kept **strictly confidential**, and under no circumstances will individual respondents be identified. The results of the survey will be used for **academic purposes only** (i.e. as part of my PhD thesis and in academic publications).

This research project has been approved by the Human Research Ethics committee at the University of Wollongong. Only a small sample of the Australian population has been randomly selected from telephone directories for this survey. If you agree to take part it would make a very valuable contribution to my research. The questionnaire is numbered to enable me to follow up recipients who do not reply. No one else but me will have access to that number.

To reward you for your time and trouble, I will send you a $3 "scratchie" (i.e. instant scratchie lottery ticket) when you return your completed questionnaire.

If you would like any further information about my study, please feel free to contact me (by telephone at 02-4221-3377 or by E-mail at ssy03@uow.edu.au), or my supervisors Associate Professor Paul K. Couchman (by telephone at 02-4221- 4052) and Associate Professor Lesley White (by telephone at 02-9850-8230).

Thank you for your time and, if you agree to help me, I look forward to receiving your questionnaire.

Yours Sincerely,

Seong Sam Yang (Ph. D. Candidate)
M.B.A., M. Pharm., B. Pharm.

Appendix X: Questionnaire: Consumer Survey on HSPs

Instructions

1. Please note that this questionnaire should be completed by any one person in this household who is **18 years of age or older.** All questions should be answered by **only one person.** Please reply to **all questions.**

2. For most questions, simply **circle** the number that corresponds to your answer.

   Example A. "Have you ever purchased one or more Health Supplement Products?" Yes ---- **1** No ---- **2**

   Example B. "There is nothing more important than good health." Strongly Agree **1 ——— 2 ——— 3 ——— 4 ——— 5** Strongly Disagree

3. For some other questions, you will be given **instructions** on how to reply.

SECTION A. Your Experience with Health Supplement Products

Health Supplement Products are products designed to improve or protect your general health. They may be sold by pharmacists, health product shops, homoeopaths, naturopaths or other retail outlets.

Health Supplement Products do **not include** medicines for which you require a doctor's prescription, or other non-prescription medicines such as painkillers (e.g. paracetamol, ibuprofen), cough or cold products, and antihistamines.

Examples of Health Supplement Products **include** (but are not limited to) **vitamins, minerals, herbal remedies** (e.g. Echinacea, Ginseng, St. John's Wort, Ginkgo, Evening Primrose Oil, Feverfew, Psyllium, Dong Quai, Guarana, Wild Yam, Valerian, Ginger Extract), **homoeopathic remedies,** and **other** health related products (e.g. Fish Oil, Cod Liver Oil, Shark Cartilage, Glucosamine, Chondroitin).

1. Over the **past** 12 months, have you purchased one or more Health Supplement Products?

   Yes -------- **1** ►►► If **Yes**, please **go to Question 2.**

   No -------- **2** ►►► If **No**, please **go to Question 3.**

2. How many **times**, if any, have you purchased each of the following types of Health Supplement Products in the **past 12** months?

	None	Once	Twice	3 times	4 times	5+ times
Vitamins/Minerals	0	1	2	3	4	5
Herbal remedies	0	1	2	3	4	5
Homoeopathic remedies	0	1	2	3	4	5
Other Health Supplement Products	0	1	2	3	4	5

3.

	extremely likely	very likely	somewhat likely	somewhat unlikely	very unlikely	extremely unlikely
3. How likely is it that you will buy a Health Supplement Product in the **next** 12 months?	1	2	3	4	5	6

PLEASE OPEN THE QUESTIONNARE AND CONTINUE WITH QUESTION 4. ►

		strongly agree	strongly disagree
4.	I have often obtained advice from friends and family about Health Supplement Products.	1 — 2 — 3 — 4 — 5	
5.	My doctor has given me advice about Health Supplement Products.	1 — 2 — 3 — 4 — 5	
6.	Adverts on TV and radio have influenced my opinion about Health Supplement Products.	1 — 2 — 3 — 4 — 5	
7.	Adverts in newspapers and magazines have influenced my opinion about Health Supplement Products.	1 — 2 — 3 — 4 — 5	
8.	Reading books has influenced my opinion about Health Supplement Products.	1 — 2 — 3 — 4 — 5	
9.	Seeing displays of products in a pharmacist or other shops has influenced my opinion about Health Supplement Products.	1 — 2 — 3 — 4 — 5	
10.	Reading manufacturers' leaflets and brochures about their products has influenced my opinion about Health Supplement Products.	1 — 2 — 3 — 4 — 5	
11.	I have often asked the advice of pharmacists or other shop assistants about Health Supplement Products.	1 — 2 — 3 — 4 — 5	

SECTION B. Your Attitudes Towards Health

The following questions ask about your attitudes **toward** health care **and** your health**. Simply read each statement and indicate the extent to which you agree or disagree with it by circling a number. Please do** not **spend** too long **on deciding your answer. It is your** first reaction **to each statement that I am interested in. Please note that there are** no **right or wrong answers.**

	strongly agree	strongly disagree
12. Treatments of illnesses should concentrate on symptoms rather than the whole person.	1 — 2 — 3 — 4 — 5	
13. Good health is of minor importance for a happy life.	1 — 2 — 3 — 4 — 5	
14. I think my body has a natural ability to heal itself.	1 — 2 — 3 — 4 — 5	
15. I keep up with the latest scientific findings about health.	1 — 2 — 3 — 4 — 5	
16. Health is more than just keeping your body fit.	1 — 2 — 3 — 4 — 5	
17. I have faith in science and scientists.	1 — 2 — 3 — 4 — 5	
18. There are many things I care about more than my health.	1 — 2 — 3 — 4 — 5	
19. I do not always believe what I read or hear about scientific findings on health.	1 — 2 — 3 — 4 — 5	
20. There is nothing more important than good health.	1 — 2 — 3 — 4 — 5	
21. Imbalances in a person's life are the main causes of illness.	1 — 2 — 3 — 4 — 5	
22. If you don't have your health, you don't have anything.	1 — 2 — 3 — 4 — 5	
23. The health of my body, mind, and spirit are related, and whoever cares for my health should take that into account.	1 — 2 — 3 — 4 — 5	
24. If I become sick, I have the power to make myself well again.	1 — 2 — 3 — 4 — 5	
25. It seems that my health is greatly influenced by accidental happenings.	1 — 2 — 3 — 4 — 5	
26. Whatever goes wrong with my health is my own fault.	1 — 2 — 3 — 4 — 5	
27. When I become ill, it's a matter of fate.	1 — 2 — 3 — 4 — 5	

PLEASE CONTINUE ▶

	strongly agree	strongly disagree
28. Health professionals keep me healthy.	1 — 2 — 3 — 4 — 5	
29. If I see my doctor regularly, I am less likely to have health problems.	1 — 2 — 3 — 4 — 5	
30. My physical well-being depends on how well I take care of myself.	1 — 2 — 3 — 4 — 5	
31. Even when I take care of myself, it's easy to get sick.	1 — 2 — 3 — 4 — 5	
32. Often I feel that no matter what I do, if I am going to get sick, I will get sick.	1 — 2 — 3 — 4 — 5	
33. The type of care I receive from other people is responsible for how well I recover from an illness.	1 — 2 — 3 — 4 — 5	
34. When I stay healthy, I'm just plain lucky.	1 — 2 — 3 — 4 — 5	
35. Following my doctor's orders exactly is the best way for me to stay healthy.	1 — 2 — 3 — 4 — 5	
36. If I take care of myself, I can avoid illness.	1 — 2 — 3 — 4 — 5	
37. Other people play a big part in whether I stay healthy or not.	1 — 2 — 3 — 4 — 5	
38. I am directly responsible for my health.	1 — 2 — 3 — 4 — 5	

SECTION C. Your Personality and Interests

The following questions ask about some aspects of your personality **and** interests**. Please indicate the extent to which you agree or disagree with each statement as you did for Section B.**

	strongly agree	strongly disagree
39. I find philosophical arguments boring.	1 — 2 — 3 — 4 — 5	
40. I would describe myself as a thoughtful person.	1 — 2 — 3 — 4 — 5	
41. I always like to find out about things.	1 — 2 — 3 — 4 — 5	
42. I have little interest in the world of nature.	1 — 2 — 3 — 4 — 5	
43. I often spend time in meditation and deep thought.	1 — 2 — 3 — 4 — 5	
44. I enjoy reading poetry.	1 — 2 — 3 — 4 — 5	
45. I am not interested in the origins of the universe.	1 — 2 — 3 — 4 — 5	
46. People consider me innovative.	1 — 2 — 3 — 4 — 5	
47. I enjoy visiting art galleries.	1 — 2 — 3 — 4 — 5	

SECTION D. Your Attitudes Towards Health Supplement Products

The following questions ask about your attitudes **towards Health Supplement Products. Please indicate the extent to which you agree or disagree with each statement** regardless of your experience **with these products.**

	strongly agree	strongly disagree
48. Health Supplement Products are too slow and subtle in their action.	1 — 2 — 3 — 4 — 5	
49. Health Supplement Products are often as effective as prescribed medicines.	1 — 2 — 3 — 4 — 5	

PLEASE TURN OVER TO QUESTION 50.

	strongly agree				strongly disagree
50. Health Supplement Products are less harmful than prescribed medicines.	1	2	3	4	5
51. I believe most Health Supplement Products do not work.	1	2	3	4	5
52. There is little or no scientific evidence about the effectiveness of Health Supplement Products.	1	2	3	4	5
53. I would recommend Health Supplement Products to a friend.	1	2	3	4	5
54. Treating myself with Health Supplement Products is more convenient than going to see a doctor.	1	2	3	4	5
55. I know little or nothing about Health Supplement Products.	1	2	3	4	5
56. Using Health Supplement Products makes me feel good because they help me control my health.	1	2	3	4	5

SECTION E. Other Information

The following questions ask for some details about the person who filled in this questionnaire. This is for statistical purposes only. **The information will help me to understand my sample and will be kept** strictly confidential.

	Much more **often**	More **often**	As **often**	Less **often**	Much less **often**
57. Compared to other people your age, would you say that you get sick.....	1	2	3	4	5
	Much more **sick**	More **sick**	As **sick**	Less **sick**	Much less **sick**
58. Compared to other people your age, when you do get sick, would you say you get.....	1	2	3	4	5
	Excellent	**Very Good**	**Good**	**Fair**	**Poor**
59. At the moment, would you say that your health in general is.....	1	2	3	4	5

60. **Are you .....** Male ----- **1** Female ----- **2**

61. **Please write your age: _____Years**

62. **Your highest educational achievement:**

University **postgraduate** qualification (e.g. Ph.D., Masters degree, Post-grad diploma) ---------- **1**

University **undergraduate** qualification (e.g. Bachelors degree, Bachelors honours degree) ------ **2**

Post-school vocational qualification (e.g. Trade certificate TAFE associated diploma) ---------- **3**

Completed highest level of **secondary** school (e.g. HSC, VCE, other Yr 12 certificate) ---------- **4**

Did **not** complete highest level of **secondary** school (i.e. left before Year 12) ---------- **5**

THANK YOU FOR YOUR TIME AND TROUBLE IN COMPLETING THIS QUESTIONNAIRE

If you lost the pre-paid envelope, please use the following reply paid number and address to return your survey.
Reply Paid 71942, Department of Marketing, University of Wollongong, NSW 2522

Appendix XI: Socio-demographic Profile of the Pretesting Samples

No.	Gender	Age	Education	Ethnicity
1	Male	40	University Undergraduate	Fijian
2	Female	44	University Undergraduate	Australian
3	Male	35	Post-school Vocational qualification	Australian
4	Female	39	University Undergraduate	Indonesian
5	Male	37	University Undergraduate	Vietnamese
6	Female	32	University Undergraduate	Chinese
7	Male	27	University Undergraduate	Lebanese
8	Male	38	Completed Secondary School	Australian
9	Female	43	Post-school Vocational qualification	Australian
10	Male	28	Completed Secondary School	Australian
11	Female	34	Completed Secondary School	Australian
12	Male	21	Did not completed secondary school	Australian
13	Female	23	Did not completed secondary school	Australian
14	Female	47	University Undergraduate	N/A
15	Female	49	University Undergraduate	Bosnian
16	Male	29	University Undergraduate	Italian
17	Female	20	University Undergraduate	N/A
18	Female	28	University Undergraduate	Sri Lanka
19	Male	60	Post-school Vocational qualification	Australian
20	Male	41	University Undergraduate	Indonesian
21	Male	38	University Undergraduate	Australian
22	Female	40	University Undergraduate	Bangladeshi
23	Female	53	University Undergraduate	Australian
24	Female	56	University Undergraduate	Australian
25	Male	54	Post-school Vocational qualification	Australian
26	Female	40	University Undergraduate	Australian
27	Female	40	Completed Secondary School	Australian
28	Male	41	Post-school Vocational qualification	Australian
29	Male	40	University Undergraduate	Australian
30	Female	44	University Undergraduate	Australian
31	Male	46	Did not completed secondary school	Australian

Appendix XII: Codebook of the Mail Survey Data

Q. No.	Code Name	Variable Name	Wording (+)	Wording (-)	Reverse*
1	PASTEXP1	Past Experience	N/A	N/A	Yes
2a	VITMIN2A	Vitamins / Minerals	N/A	N/A	
2b	HERBAL2B	Herbal Remedies	N/A	N/A	
2c	HOMEOP2C	Homoeopathic Remedies	N/A	N/A	
2d	OTHER2D	Other HSP	N/A	N/A	
3	INTENTI3	Future Intention	+		Yes
4	FAMILFR4	Cues: Family, Friends	+		Yes
5	DOCTORS5	Cues: Doctors	+		Yes
6	TVRADIO6	Cues: TV, Radio	+		Yes
7	NEWSMAG7	Cues: Newspapers, Magazines	+		Yes
8	BOOKS8	Cues: Books	+		Yes
9	DISPLAY9	Cues: Displays at shops	+		Yes
10	LEAFLE10	Cues: Leaflets, Brochures	+		Yes
11	PHARMA11	Cues: Pharmacy workers	+		Yes
12	HOLIST12	Holistic Orientation		-	No
13	VALUE13	Health Value		-	No
14	HOLIST14	Holistic Orientation	+		Yes
15	SCIENT15	Scientific Health Orientation	+		Yes
16	HOLIST16	Holistic Orientation	+		Yes
17	SCIENT17	Scientific Health Orientation	+		Yes
18	VALUE18	Health Value		-	No
19	SCIENT19	Scientific Health Orientation		-	No
20	VALUE20	Health Value	+		Yes
21	HOLIST21	Holistic Orientation	+		Yes
22	VALUE22	Health Value	+		Yes
23	HOLIST23	Holistic Orientation	+		Yes
24	IHLC24	HLC: Internal	+		Yes
25	CHLC25	HLC: Chance	+		Yes
26	IHLC26	HLC: Internal	+		Yes
27	CHLC27	HLC: Chance	+		Yes
28	PHLC28	HLC: Powerful Others	+		Yes
29	PHLC29	HLC: Powerful Others	+		Yes
30	IHLC30	HLC: Internal	+		Yes
31	CHLC31	HLC: Chance	+		Yes
32	CHLC32	HLC: Chance	+		Yes
33	PHLC33	HLC: Powerful Others	+		Yes
34	CHLC34	HLC: Chance	+		Yes
35	PHLC35	HLC: Powerful Others	+		Yes
36	IHLC36	HLC: Internal	+		Yes

Appendix XII: Codebook of the Mail Survey Data (Continued)

Q. No.	Code Name	Variable Name	Wording (+)	Wording (-)	Reverse*
35	PHLC35	HLC: Powerful Others	+		Yes
36	IHLC36	HLC: Internal	+		Yes
37	PHLC37	HLC: Powerful Others	+		Yes
38	IHLC38	HLC: Internal	+		Yes
39	OPENN39	Openness: Idea		-	No
40	OP3NN40	Openness: Value	+		Yes
41	OPENN41	Openness: Idea	+		Yes
42	OPENN42	Openness: Value		-	No
43	OPENN43	Openness: Fantasy	+		Yes
44	OPENN44	Openness: Aesthetics	+		Yes
45	OPENN45	Openness: Fantasy		-	No
46	OPENN46	Openness: Action	+		Yes
47	OPENN47	Openness: Aesthetics	+		Yes
48	BARRIE48	Perceived Costs or Barriers	+		Yes
49	BENEFI49	Perceived Benefits	+		Yes
50	BENEFI50	Perceived Benefits	+		Yes
51	BARRIE51	Perceived Costs or Barriers	+		Yes
52	BARRIE52	Perceived Costs or Barriers	+		Yes
53	BENEFI53	Perceived Benefits	+		Yes
54	BENEFI54	Perceived Benefits	+		Yes
55	BARRIE55	Perceived Costs or Barriers	+		Yes
56	BENEFI56	Perceived Benefits	+		Yes
57	SUSCEP57	Perceived Susceptibility	+		Yes
58	SEVERI58	Perceived Severity	+		Yes
59	GENERH59	Perceived General Health Status		-	No
60	GENDER60	Gender	N/A	N/A	
61	AGE61	Age	N/A	N/A	
62	EDUCAT62	Education	N/A	N/A	Yes

* If Yes, codes were reversed. For example, code 1-2 was transformed to 2-1, code 1-5 to code 5-1, and code 1-6 to 6-1.

Appendix XIII: Casewise Diagnostics of Residuals

Casewise Diagnostics [a]

Case Number	Std. Residual	Perceived value of HSPs	Predicted Value	Residual
49	2.106	19	5.79	13.21
110	2.467	19	3.53	15.47
116	2.154	19	5.50	13.50
140	-2.423	-13	2.20	-15.20
146	2.363	18	3.18	14.82
156	2.208	19	5.15	13.85
172	2.438	21	5.71	15.29
196	-2.251	-15	-.89	-14.11
213	-2.399	-8	7.04	-15.04
243	-2.939	-14	4.43	-18.43
302	-2.006	-9	3.58	-12.58
313	-2.219	-3	10.92	-13.92
333	-2.519	-11	4.79	-15.79
350	2.482	19	3.44	15.56
351	2.549	18	2.02	15.98
365	-2.067	-11	1.96	-12.96
389	2.320	17	2.45	14.55
394	-2.582	-12	4.19	-16.19
400	-2.357	-7	7.78	-14.78
411	2.285	19	4.67	14.33
428	-2.222	-13	.93	-13.93
466	2.121	13	-.30	13.30
484	-2.068	-10	2.97	-12.97
543	-2.168	-10	3.59	-13.59
554	-2.205	-5	8.83	-13.83
565	-2.075	-10	3.01	-13.01
575	-3.434	-15	6.53	-21.53
596	-2.031	-15	-2.27	-12.73
606	-3.174	-15	4.90	-19.90
637	-2.198	-11	2.78	-13.78
641	2.137	16	2.60	13.40
661	-2.482	-10	5.57	-15.57
678	2.202	13	-.81	13.81
694	-2.203	-11	2.81	-13.81
700	-2.736	-5	12.15	-17.15
707	2.060	20	7.08	12.92
737	-2.030	-7	5.73	-12.73
748	2.023	17	4.32	12.68
765	3.057	17	-2.17	19.17
806	2.012	19	6.39	12.61
818	-2.045	-7	5.82	-12.82
827	-2.269	-9	5.23	-14.23
835	-2.099	-11	2.16	-13.16
844	-2.820	-10	7.68	-17.68
879	-2.015	-9	3.64	-12.64
913	-2.876	-13	5.04	-18.04
923	-2.190	-7	6.73	-13.73
964	2.028	16	3.28	12.72

a. Dependent Variable: Perceived value of HSPs

Appendix XIV: Case Summary of Influential Observations

	Case No.	Cook's Distance	Centered Leverage Value
1	49	0.00569	0.01298
2	110	0.00632	0.01074
3	116	0.00618	0.01289
4	140	0.00515	0.00804
5	146	0.00619	0.01041
6	156	0.00294	0.00585
7	172	0.00469	0.00760
8	196	0.00611	0.01145
9	213	0.00442	0.00726
10	243	0.00792	0.00907
11	302	0.00434	0.01032
12	313	0.00579	0.01118
13	333	0.00751	0.01223
14	350	0.00595	0.00868
15	351	0.00847	0.01232
16	365	0.00417	0.00936
17	389	0.00385	0.00635
18	394	0.00487	0.00658
19	400	0.00658	0.01199
20	411	0.00714	0.01298
21	428	0.00829	0.01605
22	466	0.00274	0.00586
23	484	0.00556	0.01301
24	509	0.00477	0.01152
25	543	0.00508	0.01076
26	554	0.00483	0.01002
27	565	0.00246	0.00520
28	575	0.01770	0.01529
29	596	0.00793	0.01884
30	606	0.00845	0.00793
31	637	0.00497	0.01049
32	641	0.00418	0.00981
33	661	0.00865	0.01315
34	678	0.00889	0.01856
35	694	0.00657	0.01260
36	700	0.00994	0.01402
37	707	0.00432	0.01003
38	737	0.00252	0.00556
39	748	0.00553	0.01283
40	765	0.01200	0.01323
41	806	0.00667	0.01512
42	827	0.00616	0.01234
43	835	0.00490	0.01089
44	844	0.01124	0.01317
45	879	0.00248	0.00554
46	913	0.01222	0.01572
47	923	0.00514	0.01036
48	964	0.00271	0.00610
Total		48	48

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