AN INVESTIGATION OF UNDERGRADUATE CHOICE BEHAVIOUR OF A PREFERRED PROGRAM, DISCIPLINE AND UNIVERSITY: A CONCEPTUAL MODEL

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CERTIFICATION

I certify that except where due acknowledgment has been made, the work is that of the candidate alone; and the work has not been submitted previously, in whole or part, to qualify for any other academic award; and the content of the thesis is the result of work which had been carried out since the official commencement date of the approved research program.

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ABSTRACT

This thesis investigates the choice behaviour of first year undergraduate students through proposing and testing a conceptual model. The psychological constructs of personal values, motivation, selection criteria, demographic and socioeconomic factors introduced as underlying drivers provide invaluable insight into the pathways of influence and relationships between student types and their preference towards a particular degree program at a particular university. Questionnaires from 304 first year undergraduate students from the three academic portfolios of Business, Science, Engineering and Technology and Design and Social Context were analysed.

A series of hypothesis were proposed within a causal methodology to facilitate the prediction of student types in terms of their significant drivers. The conceptual model was tested by a structural equation model (SEM) for the significance of the relationships between particular pairs of variables. Significant pathways amongst psychological constructs were initially proposed in a hierarchy model. To generalise the findings of analysis from the SEM analysis, multinomial linear regression (MLR) was used to conduct analysis on statistically significant effects amongst drivers of choice behaviour. A discrete student choice model determined the strength and significance of the hypothesised drivers facilitating the prediction of student types. The causal analysis supported the proposition that the significance of the psychological constructs to students across the three portfolios accounts for the variability driving choice behaviour.

The empirical findings of this thesis contribute to an *in-depth* understanding of *how* fundamental constructs drive preferences and explain significant levels of variability in tertiary students' choice behaviour. By developing a causal methodology for investigating the drivers of choice behaviour within a proposed conceptual framework, important and timely contributions resulted at both an academic and marketing level. At an academic level, this

thesis demonstrated a hierarchical relationship amongst the proposed psychological constructs and identified significant predictor variables in helping to explain group membership. At a marketing implication level, the development of a discrete student choice model provides marketers with an invaluable insight into student profiles.

Clearly, there is no long term gain for universities in attracting students better suited to other degree programs. Accordingly, in terms of designing marketing strategies, the contribution of this thesis facilitates an *in-depth* understanding of significant drivers influencing choice behaviour, which becomes of considerable relevance in appealing to and retaining the students most suited to particular academic programs and universities.

Key Words

Choice behaviour, personal values, motivation, selection criteria, structural equation modeling and multinomial logistic regression.

Chapter 1

INTRODUCTION

1.1 Introduction

Each year a large number of school leavers make the decision to enter higher education. Prospective students express their field of study aspirations by choosing particular degree programs at particular institutions. Applicants will in determining preferences consider what attributes are important to them and consciously or unconsciously, trade off between these (Soutar and Turner 2002). Accordingly, each student cohort will consider different selection attributes when making their choice of program and university (Veloutsou, Lewis and Paton 2004). Relevant to the trade-off process is the individual applicant (international or local, full time or part time study), their level of study, degree selection and in particular their field of interest. A student's preferred course set represents the courses that best match each individual's personal interests, career objectives and judgment of attainability. For those students who enrol in a particular bachelor degree course in Australia, between four and five out of every ten students will not obtain a degree (Long, Ferrier and Heaney 2006). In a changing tertiary landscape, the relevancy of student attrition rates is how it relates to and impacts on universities through the broader theme of course retention.

The higher education sector operates in a fluid competitive environment. In such a climate for universities to remain globally competitive and to ensure sustainability, they must continually adapt and evolve in terms of policy development and strategic direction.

Strategically, one of the most important objectives of any university is attracting and retaining students suited to the courses offered (Veloutsou et al. 2004). Critical therefore to recruiting and retaining a financial interest in the share of the undergraduate market is an understanding as to *how* and *why* prospective students choose among available institutions for a field of study that interests them (Drewes and Michael 2006; Maringe 2006; James, Baldwin and McInnis 1999). It is then the university, parties other than universities, and the students themselves that have a role to play in improving the match between the ability, disposition and aspiration of students and the courses in which they enrol (Long et al. 2006).

1.2 Objectives of the Research

The focus of this thesis is to develop a conceptual model that investigates the psychological constructs that drive preferences of degree program and universities in undergraduate students' choice behaviour. Choice behaviour is explained by identifying *how* and *why* these relevant determinants drive student preferences. The thesis proposes a pathway of influence and a discrete student choice model of personal values, motivation, selection criteria, demographic and socioeconomic variables derived from the literature on tertiary student's selection behaviour. Establishing a plausible model will further facilitate understanding the variability of choice behaviour within an educational context.

The general aim of this thesis is guided by a selection of research questions centred on two themes:

(1) <u>Conceptual Model and Pathways:</u>

(a) What is a plausible model for understanding the importance of psychological constructs within an educational context?

(b) What is the pathway of influence amongst the hypothesised drivers of preference?

(2) <u>Influential Drivers in Choice Behaviour</u>

(a) What role and influence do personal values have on preference behaviours as reflected in a respondent's selection criteria for specific programs and universities?

(b) What is the role of academic motivation as a direct and mediating factor on selection behaviour?

(c) What set of attributes do first year undergraduate students consider important when determining preferences?

(d) What profiles do student group characteristics reflect on the basis of their preferences across three choices of; program, discipline and university?

(e) What socioeconomic and demographic variables impact student preferences?

(f) How significant are the constructs of personal values, motivation, selection criteria and socio economic factors in differentiating between student's choices?

Translated into two specific objectives, they are as follows:

1. To empirically test causal processes underlying the observed relationship among variables to estimate the relative importance of alternative paths of influence between personal values, motivation and selection criteria of first year undergraduate students.

2. To test whether the effects of personal values, motivation, selection criteria and socio economic factors are significant in differentiating between student's choice of a degree program, discipline and university.

In Australia, the higher education sector has rapidly evolved towards an overtly market-based system in which universities and other providers strenuously compete for students. As a cohort, the undergraduate market is a large and profitable segment. An overview of the tertiary market, its composition and growth opportunities are discussed in the next section.

1.3 Background to the Study

In Australia, the higher education market is comprised of establishments mainly engaged in providing university undergraduate or post-graduate teaching and/or research. There are 37 public and three private universities and four other self-crediting higher education providers. Australia has also over 100 higher education providers approved by State/Territory authorities to offer a particular higher education courses (DEST Annual Report 2004/5). Industry revenues amounted to $23.86 billion in 2005-06 and grew to $24.9 billion by the end of 2006-07. According to the OECD, the total expenditure (public and private) on tertiary education in Australia was equivalent to 5.97% of Gross Domestic Product in 2002. This was lower than in the United States, Sweden and Canada, but higher than in the United Kingdom and some other European countries (IBISa 2007).

1.3.1 Sources of Revenue

The main sources of revenue for universities are Australian Government grants Higher Education Contribution Scheme (HECS) payments, domestic and overseas fee paying students, and other fees and charges, research contracts and grants, and investment income (refer to Table 1.1). The vast majority of domestic undergraduate students at public universities undertaking an award course are Commonwealth supported (around 97%) by means of HECS.

HECS was introduced in January 1989 in order to reduce the level of Commonwealth Government funding of higher education from general revenue. Tertiary institutions have been able to charge domestic students fees for undergraduate courses, provided that the number of domestic students being charged tuition fees for a particular course did not exceed 25% of the total number of places available for domestic students in that course. The HECS fee provided approximately 25% of the cost of a higher education place. From 2005, financial assistance to students was replaced by the Higher Education Loan Programme (HELP). This includes HECS-HELP for Commonwealth supported domestic students, FEE-HELP for fee-paying domestic students, and OS-HELP for Commonwealth supported students studying overseas (IBISa 2007).

Table 1.1: Sources of Funding for Higher Education Institutions 2004

Sources of Funding	Percentage of Total
Commonwealth Government Grants	41
HECS	15
State Government	2.4
Fees and charges	24
Other income	17.6
Total	**100**

Source: AVCC

1.3.2 Changing Tertiary Landscape

Progressive policy amendments as an outcome of introduced government initiatives have established the conditions for greater competition between universities for undergraduate students. As a result, 'university marketing activities have intensified and there is greater student choice in courses and subjects, more flexibility in modes of delivery and more pressure on staff to be innovative in teaching and learning' (Krause, Hartley, James and McInnis 2005, p.4).

Government funding is a major consideration confronting universities. Some changes to government funding have included:

- The Commonwealth Government has provided funding of $347 million over three years from 2005 to support around 25,000 new fully funded places to replace marginally-funded HECS places. The expected outcome is diminishing growth in HECS places.

- The advent of the Federal Government's plans for structural changes of the institutions within the industry, through developing teaching and research only universities. The impact of modifying the structure of government funding would greatly disadvantage the teaching-only institutions, as currently all universities receive substantial amounts of funding for research.
- The 2005 Commonwealth Government reform package allowed universities to charge up to 25% more HECS than the government-set level for all courses except nursing and teaching. Therefore, universities that do not increase fee income will be

relatively more reliant on Commonwealth funding and more vulnerable to a shortfall from inadequate indexation of this funding. Consequently it is expected that fee increases will continue over the five years to June 2012, especially if government policy allows for increased HECS fees again.

- This reform package also places demands upon higher education institutions to seek to reduce the call on government funding; to increase competition within the industry; and, where there is a lack of scale economies, to increase collaboration between universities. Australian universities are disadvantaged by relatively low levels of revenues from donations and from corporate-sponsored research, compared with universities in some other countries such as in the United States.

- An increasing expectation for universities to increase the flexibility of their courses so as to attract enrolments of those students with full or part time employment.

- Another strategy that is expected to be implemented over the five years to June 2012 is the expansion of postgraduate courses. The University of Melbourne decision to offer more generalised undergraduate degrees, with specialisation to come through postgraduate study is an illustration of such a strategy whereby a more American style education structure is incorporated. A further implication will be a change in the composition of the University of Melbourne's student body, increasing postgraduate students while decreasing the number of undergraduate students. Through this new student mix, the University of Melbourne will be able to decrease their total student numbers while not reducing their potential revenue as all postgraduate courses are full fee paying.

1.3.3 Trends in the Undergraduate Market

In 2005, there were 421,505 HECS liable places at Australian higher education institutions. Domestic undergraduate HECS-liable students accounted for an estimated 58% of all students in 2005. In March 2006, 63% of students at higher education were studying on a full time basis and 69% of students were studying at the undergraduate level. In March 2007, it is estimated that there were 982,221 students enrolled at 50 higher education institutions. An estimated 55% of students at higher education institutes were female, 63% were studying on a fulltime basis and 69% of students were studying at the undergraduate

level (IBISb 2007). Collectively, undergraduate students as a cohort, not only continue to increase the universities' revenue base, but also are influencing the direction of tertiary programs. For example, universities are expected to 'expand their online education capabilities, increasing external courses, and the flexibility of their internal courses' (IBISb 2007, p.11). Further there has been a substantial increase in the total number of commencing students (131% increases) over a nine year period (refer to Table 1.2) accompanied by a remarkable increase in the number of undergraduate courses offered (132% increase).

Table 1.2: Comparative First year Undergraduate Commencing Student statistics 1994-2003 a

	1994	**2003**
Commencing students - total enrolment	159,076	216,559
Equivalent full-time student load	130,422[b]	171,317[b]
New to higher education	Not available	100,982
Age 19 and under	85,158 (54%)	108,998 (50%)
20-24 years	34,202 (21%)	57,695 (27%)
25 years and older	39,716 (25%)	49,866 (23%)
International students	13,691 (9%)	50,060 (23%)[c]
ATSI – undergraduate courses	1,985	2,627
ATSI – enabling and non-award courses	952	974

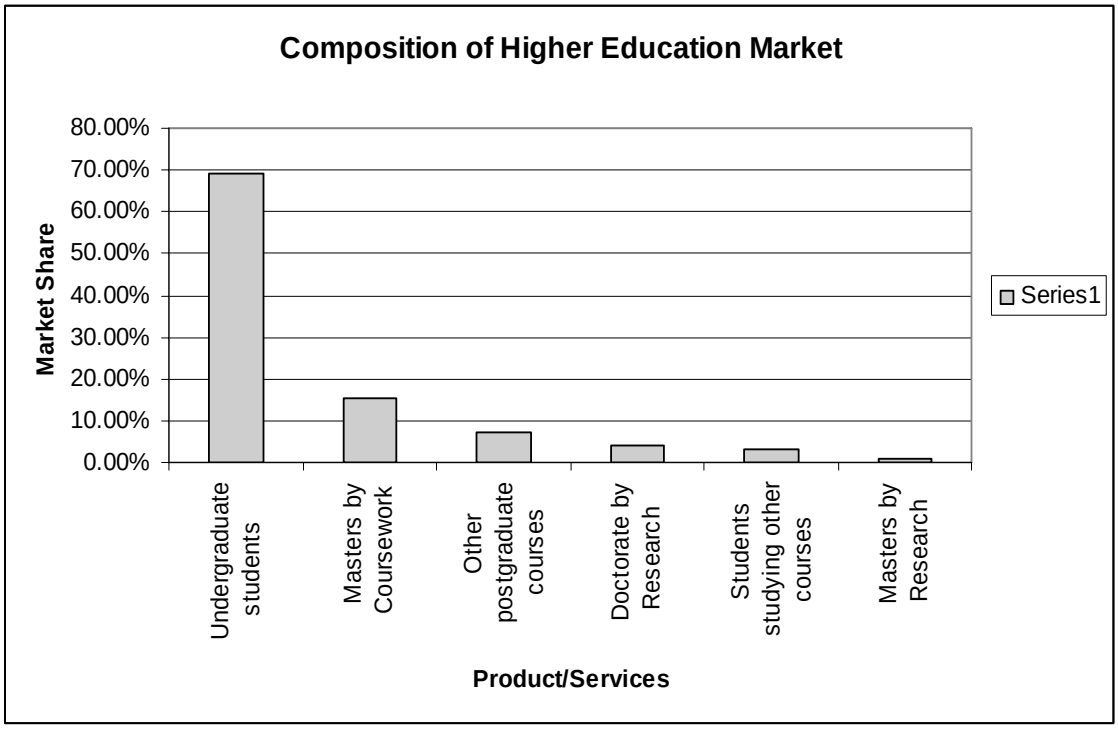
[a] 2003 data only were available at the time of writing but they are considered sufficiently indicative to be used here. [b] Excludes enabling, non-award courses and cross-institution programs. [c] Proportional data in parentheses are based on raw figures reported in DEST data; these may differ from other reported statistics depending on whether calculation is made based on EFTSU and accounting for combined degree status.

1.3.4 Domestic Demand for the Undergraduate Market

:Overall enrolments are forecast to increase by an average annualised rate of 1.7% over the five years to June 2012, as universities employ different strategies to maintain current enrolment levels" (IBISa 2007 p.45).

The major services offered by higher education institutions are the provision of accredited undergraduate and postgraduate courses. Australian universities have three broad student population segments (high-school leavers for undergraduate programs) international students (offshore and onshore for both undergraduate and postgraduate programs) and mature-age students for primarily postgraduate programs. The composition of the Higher Education market is depicted in Figure 1.1.

Figure 1.1: Composition of Higher Education Market (IBISa 2007)



In 2007, Victorian universities offered 39 271 government funded (or HECS) places, up 1364 on 2006, and a jump of about 4000 for undergraduate places to 58,839; however the rise has been outstripped by the surge in prospective students applying for courses (Morton 2007). Perhaps one of the most significant changes that have occurred is the drop in unmet demand for undergraduate university places (Harvey-Beavis and Elsworth 1998). At its most generic level, a demand can be seen as the expression of a want by individuals. Within the education market, a demand is a set of requests asserted by the applicant for a course in tertiary education. First preferences can be interpreted as the most vigorous demand, and are by definition new applicants to the field. The last choice made by an applicant can be viewed as the least vigorously asserted of the demands. Thus an applicant

does not make a demand, but a series of demands which may not just be for 'this or that course, but a type of course' (Harvey-Beavis and Elsworth 1998, p. 9). Demand for undergraduate higher education places comes from two main sources; aspiring students can apply for a place through admission centres or can apply directly to universities (Li, Karmel and Maclachlan 2000).

Unmet demand is used as a 'means of describing the difference between the availability of Commonwealth supported places and the number of qualified people applying for them' (MCEETYA 2003, p.15). The Australian Vice Chancellors' Committee releases unmet demand estimates annually, which are discounted to take account of multiple applications, unqualified applicants and students not accepting offers. Australian Vice Chancellors' Committee (DEST Annual Report 2004/2005) estimated unmet demand is to have decreased by more than 60 percent between 2005 and 2006.

However, although unmet demand estimates are publicly received as compelling evidence of a short-fall in the availability of supported places, the validity of this measure has yet to be verified. Moreover, the question of whether new places should be allocated to regions with high unmet demand remains unanswered. A more valid indicator of unmet demand should only include 'those applicants, who have a genuine and well-informed desire to enter and complete university studies, but fail to do so because there are not enough places' (MCEETYA 2003, p13-16).

A study by Harvey-Beavis and Elsworth (1998) which initially set out to investigate the concept of unmet demand for tertiary education concluded as a concept it has become obsolete due to the rapidly changing policy environment at a federal, state and university level. This conclusion led to recasting their study to investigate patterns of demand for tertiary education and the implications for policy formation. Therefore, understanding student influence over the distribution of tertiary places would allow students 'greater access to their preferred course and institution, and enable preferred providers to grow to meet demand' (p.9).

As the number of university places increased significantly in 2005 and 2006, the number of eligible applicants for undergraduate university places declined, particularly in Western Australia and Victoria where decreases were recorded. One of the attributing factors some

universities have reported is difficulty in attracting students to particular courses. An outcome to address this concern entailed DEST working closely with those universities as to how to manage consequences and more effectively develop strategies to better align supply with demand of places (DEST Annual Report 2004/2005).

1.4 Significance of the Research

This thesis extends the literature on choice behaviour in two fundamental ways. First, to date, a critical review of literature pertaining to choice behaviour has revealed research identifying a set of the most important selection attributes has predominated past literature. As a result, marketing and behavioural researchers have become consistent in terms of ranking important and relevant attributes. Accordingly, the challenge for educational marketers is to move beyond descriptive profiling in order to acquire an *in-depth* understanding of key drivers influencing a student's behaviour in deciding their preference. Armed with this knowledge, educational marketers are better able to tailor marketing strategies for different markets by attracting and retaining a sustainable share of prospective students. The interest in the topic of choice behaviour is not new. In 1988, Stage and Hossler (p.2) stated, 'Institutional policymakers are concerned with what they can do to attract desirable high school graduates to their campuses'. A decade on, James et al. (1998) identified an important gap in research while investigating the factors influencing selection behaviour. That of 'why and how' prospective students exhibit particular selection behaviour towards preferred universities. However to date, in comparison to the abundance of studies directed towards selection criteria, very few studies have concerned themselves directly with *how* these underlying factors drive a student's preferences. Therefore, this thesis extends the literature on choice behaviour by addressing this gap in current literature by introducing how known drivers influence preferences.

Research of this nature has important implications for Australian universities in a competitive and growing market place. Understanding the importance undergraduate students allocate to the selection criteria of choosing particular programs, disciplines and universities can effectively provide an insight to what students deem important and relevant in term of their motivation and choice behaviour. While knowledge of selection criteria are appropriate in providing an information base as to which and what type of universities are appealing, attributes per se do not provide an insight into which personal values underlie

the motivation which drives preferences for a specific university, discipline, and program. Furthermore, the analysis of the behaviour behind preference selection is a pathway to explore potential market opportunities and then to construct a relevant marketing-mix for effective and timely marketing strategies.

Understanding the underlying forces influencing choices and decision making behaviour in an educational market can empower marketers in designing relevant and effective integrated marketing strategies directed towards appealing to particular student cohorts. Marketing strategies demand promotion and positioning the product in a way that the target audience must perceive as credible (Allan 2001) dispelling the belief that a student's choice of higher educational institute can be affected by merely modifying an institution's description (Chapman 1981). It is imperative for marketers to get closer to their potential customer and there is an explicit need to understand the decision making state of the student in a competitive market place (Moogan and Baron 2003). Therefore gaining knowledge and understanding of what attributes are deemed important and are perceived as compatible to different market segments then becomes paramount. Thus, if student segments can be profiled and understood in terms of significant drivers, then 'efforts to attract, appeal to, communicate with and influence them can be designed around a concept that is very close to basic motives' (Muller 1991, p57; Rokeach 1973).

Consequently, while a set of identified criterion found in existing literature may provide a foundation for marketing strategy formation, the outcome of this research aims to contribute to current research through addressing such questions as: *Why* do some students consider some attributes more important than others? *How* are such levels of variability in choices across courses and universities explained? *What* drives student preference in selecting different program and universities? *How* do psychological constructs influence behavioural outcome? *Why* do students differ in prioritising selection criteria and preferences? *Do* demographics and socioeconomic variables influence selection behaviour?

Second, a conceptual model of psychological constructs hypothesised to drive choice behaviour will be tested by two distinct but mutually supporting stages in research. A causal methodology will facilitate the development of an initial hierarchy model to investigate significant pathways amongst psychological constructs. Through this approach of assessing the contribution made by predictor variables and paths of influence, a clearer

and more precise theory can be hypothesised about relations among predictor variables (Kahle and Kennedy 1989). In addition, in contrast to other applications of a hierarchy model applied to investigate significant relationships amongst psychological contrasts (Homer and Kahle 1980), the constructs of *personal values, motivation and selection criteria* introduced for this thesis have not been previously assessed in a hierarchy model, nor has a hierarchy model been applied in an educational context. Following on, a sequential application emanating from a causal approach will be that of a multinomial logit model of student preferences. The discrete student choice model will attribute choice behaviour to psychological variables that may be perceived different by cohorts of students when considering choice of a preferred program, discipline and university.

Accordingly, the significance and contribution of this thesis can be considered from two perspectives; the contribution on an academic level towards the field of consumer behaviour and marketing literature and on a practical marketing level though proposing a framework for developing marketing strategies. More specifically the contributions of this thesis to the marketing, education and psychology literature are:

- Developing a two step causal methodology for investigating the drivers of choice behaviour.
- Proposing a hierarchical model of psychological influences of undergraduate students.
- Examining the causal relationships among personal values, motivation and selection criteria.
- Adapting and extending an established behavioural paradigm –'value-attitude–behaviour' hierarchy model (Homer and Kahle 1988) for application in an educational context
- Translating of List of Values (LOV) into parenthetical statements relevant for application in an educational context.
- Developing a discrete student choice model to account for the variability in choice behaviour.

- Providing empirically determined insights for tertiary institutions to:

    - Understand the choice behaviour of prospective undergraduate students through the profiling of student types.

    - Utilise a conceptual model to pursue customised marketing strategies while taking into consideration what cohorts of students deem relevant and important.

    - How to translate key drivers students associate with when undertaking a particular program in a particular discipline at a particular university into attributes when creating customised marketing strategies.

    - Better understand the issues concerning first year student attrition and therefore course retention rates.

1.5. Rational for the Thesis

:Better matching of students, universities and courses would contribute perhaps substantially to reducing discontinuation among younger students, as well as opening up places that are currently taken, but unwanted, to other potential entrants and thus also reducing inefficiency in the use of public resources for higher education (Long et al. 2006 p.182).

In a highly competitive HE environment, understanding the choice and decision processes of intending applicants is a proactive approach in addressing student attrition rates and the broader theme of course completion. As part of their survey, Long et al. (2006, p.7) asked respondents whether the current course they were enrolled in was their preferred course. The results showed attrition rates increased progressively for students who had reported that they had not wanted to enrol in their current course. Furthermore, their report indicated the first year attrition rate for domestic students from the 14 universities that participated in the study who began pass degree courses in 2004 was 20.6%. Although it appears the attrition rates for domestic students on the whole have remained relatively stable over the periods from 1994 to 2006 (Lukic, Broadbent and Maclachlan 2004), the majority of students who do not complete their degree course discontinue in the first year of their

course. By definition attrition rates provide a measure of the proportion of students who 'drop out' of an award course at an institution each year.

Furthermore, Pitkethly and Prosser (2001) argued there is general agreement in the literature that a high proportion of students either withdraw or fail because of adjustment or environmental factors, rather than because of intellectual difficulties. Among other things, factors included lack of clearly defined goals on the part of the student, feelings of isolation and a mismatch between the student and the course or university culture. Some of the underlying concerns confronted by universities in dealing with enrolments of those students who don't go on to complete their course primarily involve waste of 'effort, resources and opportunities'. Other major outcomes identified (Long et al. 2006, p.1-3) include:

- Students who spend a year or perhaps longer studying without obtaining a qualification may gain little economic advantage from their study yet face the prospect of HECS re-payments or have already met the costs of university fees. Furthermore, there may also an associated cost of personal disappointment of students who do not complete their courses.

- Opportunities foregone while studying may be at least as important as all the other costs a student bears. Students who don't complete their degree could instead have been enrolled in another course they could have completed, been working full-time or participating in some other productive activity.

- Governments usually bear part of the costs of incomplete study. About two-thirds of the study costs of the vast majority of undergraduate students are met by the Australian Government through direct grants to universities. These monies could instead have been used to reduce taxes or to increase spending in other areas. In other words, such government-funded expenditure does not produce any productive outcomes.

- Other less tangible costs can also be identified. Students who do not finish their degree are arguably a cost for applicants who missed out on a university place.

- In an economic environment where higher levels of education and skill are required, lower course completion rates may reduce demand for higher education

by increasing the risk for commencing students. Lower completion rates may lower the morale of teaching staff, but the overall financial effects on universities are unclear.

- There are differences in both characteristics and drivers for students who drop out of university study altogether and those who change courses or universities.

- Some of the movement between courses appears to be students constructing their own pathways to preferred university studies.

- A substantial element of movement between universities is associated with students moving to a university they perceive as more prestigious, offering better career prospects, or to the course and career they now want.

Clearly, course completion is a concern for universities as each university must understand the needs and experiences of its own students (McInnis, James and Hartley 2000). Each university's situation is different, and will require action appropriate to its own situation (Pitkethly and Prosser 2001). Relevant to policy and program development is to know if particular groups or categories of students are more inclined to drop out of higher education than others (Lukic et al. 2004). Knowledge therefore, of how and why student choice is made towards particular academic programs becomes valuable information for educational marketers.

1.6 Methodology

In terms of selecting a relevant research design, this thesis will adopt a causal approach facilitating quantitative data analysis. However, the two phase approach to scale development for the measurement instrument will initially involve exploratory research for item generation. Early validation of the measurement instrument through pre-testing will constitute the second phase. Three sets of proposed hypotheses will be tested empirically using both descriptive and inferential statistics.

Using data collected by survey from first year undergraduate students, a preliminary data analysis will involve undertaking descriptive analysis to provide an understanding of the

sample and their behaviour, sample distributions of the various behavioural and demographic variables. Another aim of the descriptive statistics by means of measures of central tendency and dispersion is to assess how representative the sample is, with respect to preferences of particular programs, disciplines and university. Descriptive analysis will also facilitate hypothesis testing through the use of non parametric techniques as chi square test for relatedness and the Mann-Whitney U test (Wilcox ranks sum W test) for the second set of hypotheses proposed. In addition to the descriptive statistics, the properties of the three measurement scales; Personal Values Influence Scale (PVIS), Motivation Influence Scale (MIS) and Selection Criteria Influence Scale (SCIS) will be tested through exploratory factor analysis (EFA).

The main study addresses the hypotheses proposed through a causal approach tested by two distinct but mutually supporting stages in research analysis. In the first stage of the research, the conceptual model is tested by a structural equation model for the significance of the relationships between particular pairs of variables. To generalise the findings of analysis from structural equation model analysis, a discrete choice model is developed. This choice model is used to conduct further analysis on statistically significant effects amongst drivers of choice behaviour and how the hypothesised independent drivers account for the variability that exists amongst a student's preferred choice of a particular discipline.

The field of investigation and methodologies adopted in this thesis reflect a multidisciplinary approach. These disciplines include consumer marketing, marketing research, buyer behaviour, education and psychology. To ensure clarity of the use of certain words and terms, definitions of all key words are provided in the next section.

1.7 Definition of Terms

Decision making process: the five stage decision making model comprising of: problem recognition; information search; evaluation and selection; purchase and postpurchase behaviour.

Choice behaviour: is the act of making a preferential selection among two or more alternatives, usually made after a period of deliberation on the basis of evaluative criteria.

Choice set: A students' preferred course set represents the academic programs, discipline and university that best match each individual's personal interests, career objectives and judgment of attainability.

Behaviour: includes individual choices and observable behavioural patterns.

Personal values: are understood as psychological constructs that may be classified as internal; external or interpersonal. According to the List of Values (LOV) typology individual *internal values* comprise of (self fulfilment; excitement; sense of accomplishment; and self respect) (2) *inter-personal internal values* (fun and enjoyment in life and warm relationship with others) and (3) *external values* (sense of belonging; being well respected; and security).

Motivation: as a psychological construct is considered a driver of behaviour and is frequently classified as either intrinsic; extrinsic or amotivation.

Selection criteria: is identified as factors and or attributes influencing the selection behaviour of students when considering entry to a degree program and/or a tertiary institution.

Structural equation model: a statistical methodology that takes a confirmatory (i.e. hypothesis testing) approach to the analysis of relationships among variables.

Multinomial logistic regression: an extension for the binary logistic regression when the categorical dependent variable has more than two outcomes.

PVIS: Personal Values Important Scale based on List of Values (Homer and Kahle 1988).
MIS: Motivation Importance Scale based on Academic Motivation Scale (Vallerand et al. 1999).

SCIS: Selection Criteria Influence Scale (Veloutsou et al. 2004, Soutar and Turner 2002).

Portfolios: RMIT University's academic faculties.

1.8 Outline of the Thesis

The structure of the thesis is outlined below.

Chapter one introduced the background to the thesis including the current state of the Australian tertiary market and its future direction. Also stated were the major objectives, relevant research questions, the rationale and potential contribution of this thesis. The remainder of the thesis will be structured as follows.

Chapter two discusses the literature related to choice behaviour in general and the constructs influencing the preferences of undergraduate students when choosing to enrol in a particular degree program and university. Emanating from past literature, a conceptual model is developed and introduced. The conceptual model provides a theoretical framework for assessing the influence of drivers of choice behaviour. In this thesis, the drivers of choice behaviour are identified as personal values, motivation, selection criteria and demographic and socioeconomic factors. Each driver is discussed in detail. Three sets of hypotheses are proposed. The chapter concludes by identifying a pertinent gap in choice behaviour research which is *how* known drivers emanating from past literature influence preferences.

Chapter three introduces and discusses an appropriate methodology with which to investigate the drivers of choice behaviour. The theoretical foundations of exploratory factor analysis; structural equation modeling and multinomial logistic regression are discussed to provide a basis of understanding the approach. This chapter also incorporates descriptions of the data collecting instruments and includes the exploratory research undertaken in the process of scale development and early validation of the measurement instrument. Chapter three concludes by demonstrating the suitability of the measurement instruments and the analyses to research questions postulating causal relationships and links between constructs. The proposed hypotheses developed from the conceptual model are tested empirically using both descriptive and inferential statistics. The results of research are presented in chapters four, five, and six through the proposal of three sets of hypotheses.

Chapter four presents the results of the descriptive analysis to provide an understanding of the sample and their behaviour, sample distributions of the various behavioural and demographic variables. This section will assess how representative the sample is with respect to preferences of particular programs, disciplines and university. Descriptive analysis also facilitated hypothesis testing through the use of non-parametric techniques as chi square test for relatedness and the Mann- Whitney U test (Wilcox ranks sum W test) for the second set of hypotheses proposed. The section profiles each of the three student cohorts representing the three portfolios or faculty groupings at RMIT University; they are Business; Design and Social Context (DSC) and Science, Engineering and Technology (SET). The psychometric properties of the three scales; Personal Values Influence Scale (PVIS); Motivation Influence Scale (MIS) and Selection Criteria Influence Scale (SCIS) and their indicators will also be tested through exploratory factor analysis (EFA).

Chapter five presents and discusses the results and findings from testing six hypotheses by the development of a structural equation model. The section also identifies the measurement properties (reliabilities and validities) of the observed and latent variables. The section concludes by examining the significant pathways and association amongst important psychological constructs.

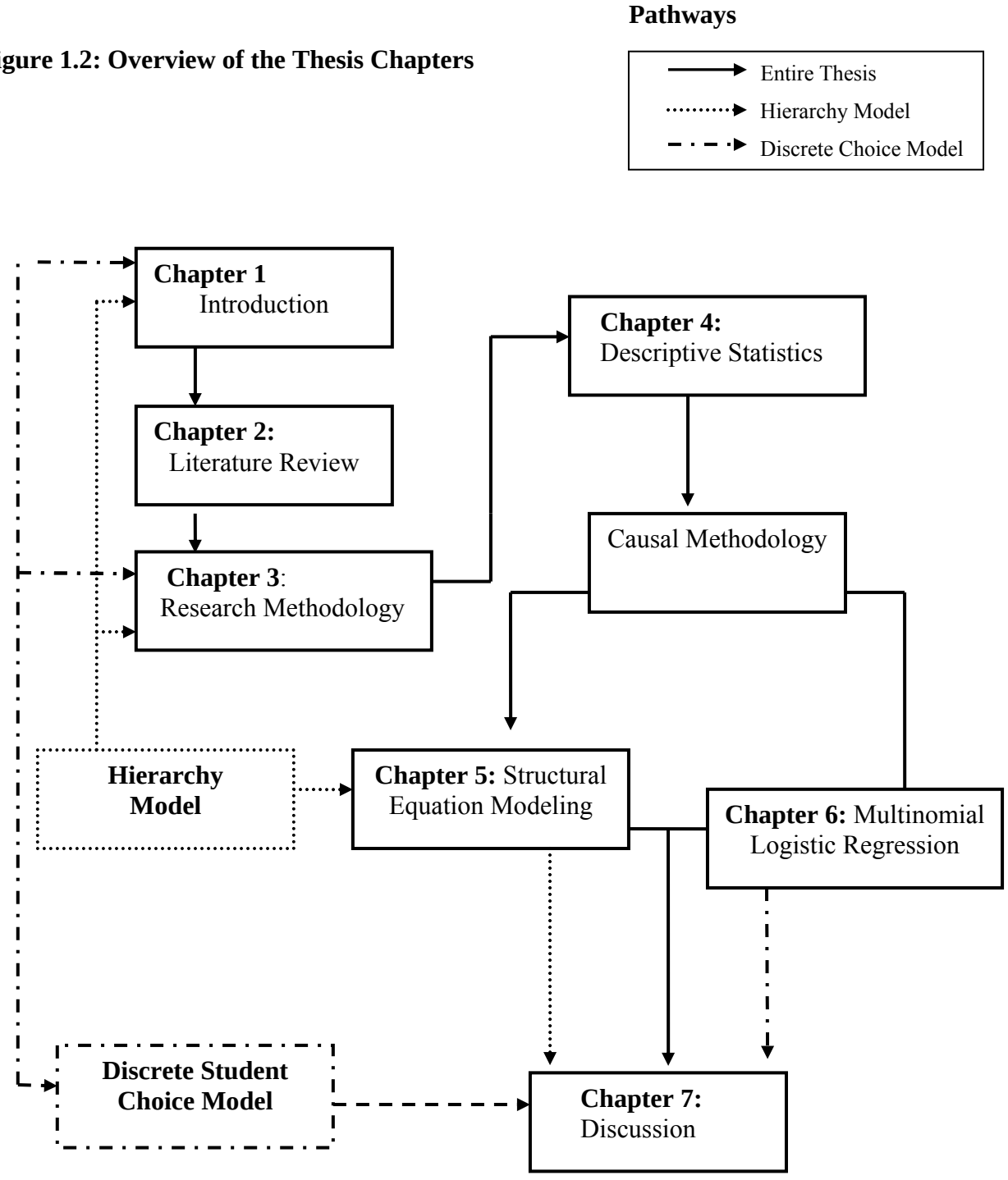
Chapter six presents and discusses the results and findings from testing the third set of hypotheses by the development of a logit multinomial model to apply to students' choice behaviour. The section also includes simulation analysis conducted to assess the impact of change in terms of the strength of the mean item score on importance rating of significant predictor variables. The underlying patterns of responses are also discussed.

Chapter seven presents an overview regarding the interpretation of the models and results of the analysis presented in the thesis. The purpose of this chapter is threefold. First, the chapter presents an overview of the results of hypothesis testing. Second, it reflects upon the contributions this thesis makes to the literature, both at a conceptual level and at practical level in terms of the marketing implications. Third and final aim is to identify and suggest recommendations on opportunities for future research in this field of research.

1.9 Approach to the Thesis

Figure 1.2 depicts an overview of the relevant thesis chapters in detailed progression. However, certain sections of the thesis may be considered and read independently influenced by the interest of the reader. For example, if the focus is examining research relating to discrete choice models, of relevance would be following the pathways as depicted by - · → in Figure 1.2 that is Chapter 1, 3, and 7.

Figure 1.2: Overview of the Thesis Chapters



Chapter 2

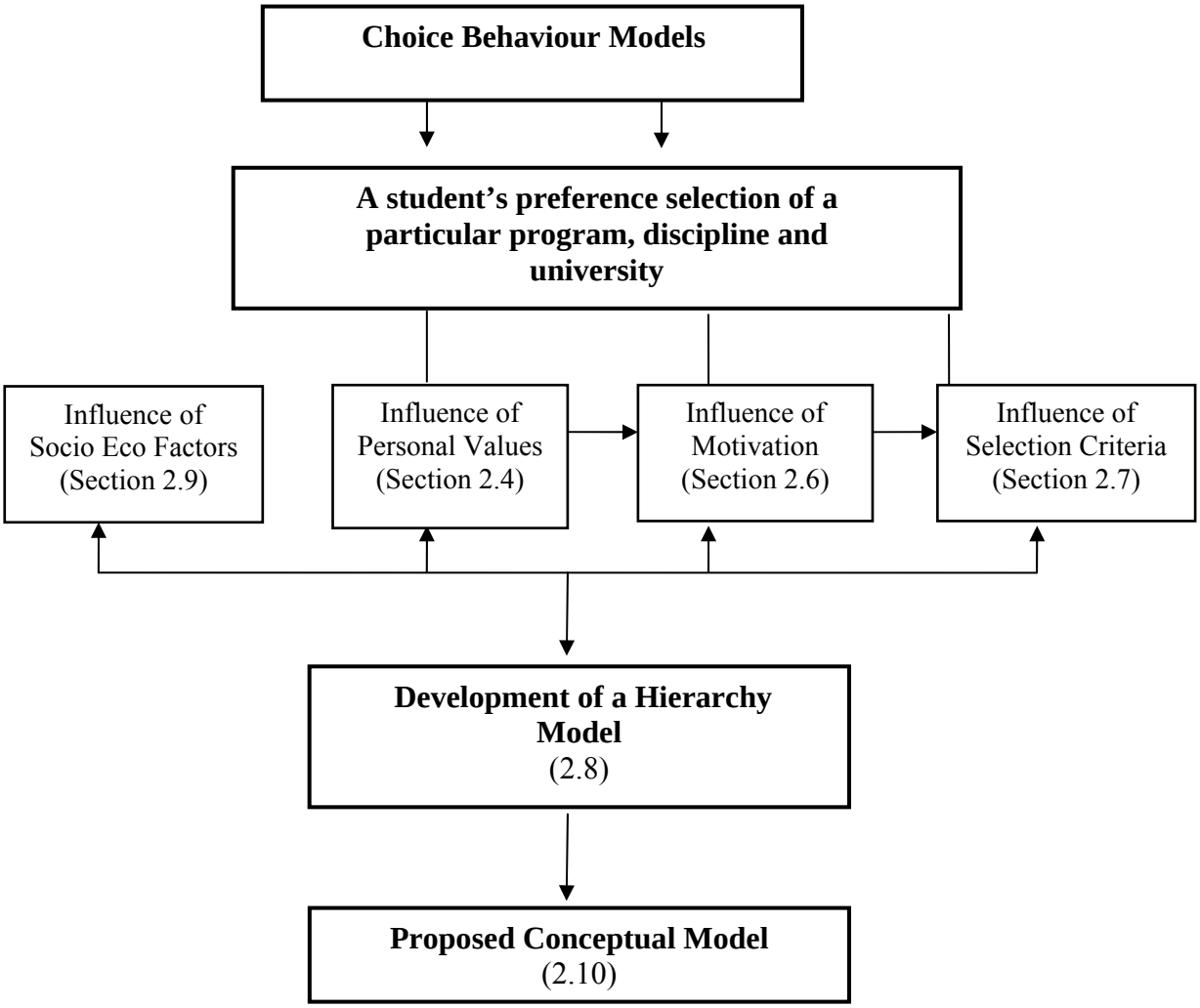
THE REVIEW OF LITERATURE

2.1 Introduction

Chapter one introduced the background to the thesis, including the current state of the Australian tertiary market and its future direction. The chapter also identified a pertinent gap in choice behaviour research which is *how* known drivers emanating from past literature influence preference. This chapter reviews the main body of literature pertaining to the fundamental purpose of the research. The focus of this chapter therefore is to establish a conceptual model to ascertain how psychological constructs explain levels of variability in undergraduate student choices of degree program and universities.

To develop a conceptual model for this thesis, two sequential themes will be introduced and discussed. The first theme will focus on an overview of decision making behaviour and choice models leading to a proposed conceptual model. Theories related to the 'value-attitude hierarchy model' will also be discussed. To model students' choices, the second theme will detail the psychological constructs of personal values, motivation, selection criteria and demographic and socioeconomic predictor variables hypothesised to drive group membership into a particular academic program and discipline. Accordingly, the direction of the review depicted in Figure 2.1 is will be influenced by two main sequential themes; the investigation of influential drivers in choice behaviour and the development of a conceptual model.

Figure 2.1: An Overview of the Literature Review.

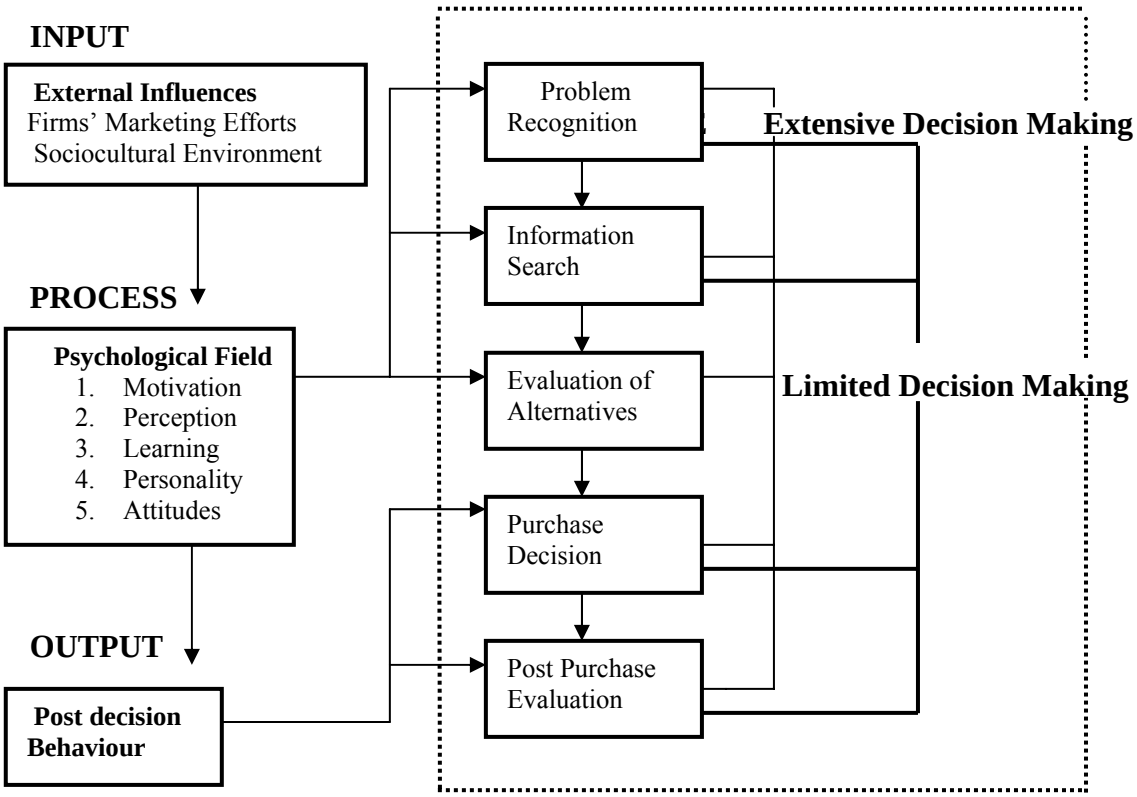


The following section introduces some theories and models of the decision making process, particularly in relation to the influences driving choice behaviour. The pattern prospective students' decision-making behaviour reflects is of consequence in a higher education system in understanding the demand for different degree programs. The theories and models are presented in a general form and are used to provide a theoretical underpinning as guidance to the approach this thesis will take.

2.2 Choice Behaviour

Decision-making involves making a choice between two or more alternatives. The five-stage process recognised as a series of sequential steps forms the basis of consumer buying behaviour (Schiffman, Bednall, Watson and Kanuk 2008; Quester et al. 2008; Bruner II and Pomzal 1988, Howard and Sheth 1971). This five stage model outlined in Figure 2.2 is relevant for when an individual purchases either goods or services.

Figure 2.2 Model of Decision Making



Extensive Decision Making ———

Limited Decision Making ———

There are internal and external influences affecting a buyer's consciousness which may or may not lead to purchase. The decision making model has three major components.

(1) *Inputs:* draw on external influence on the decision making. Marketing influences includes organisations' marketing mix and effort. Sociocultural influences constitute non marketing influences and comprise of family, social class and culture.

(2) *Process*: pertains to how decisions are made. Relevant to this step is an understanding of psychological constructs (motivation, perception, learning, personality and attitudes) that impact upon the three part decision process perceived risk and level of consumer involvement. An evaluation of alternatives can involve establishing a criterion from which selection can be made to facilitate purchase intention and choice behaviour**.**

(3) *Output:* purchase and post purchase evaluation.

A study by Mooga and Baron (2003) gives further appreciation of the influences impacting the decision making process adopted by candidates hoping to gain entry into higher education. The first three phases of the consumer decision making model, problem recognition, information search, and evaluation of alternatives were applied as a framework to examine the decision making behaviour of 674 prospective applicants. The objective governing the study was to acquire information pertaining to what stimulated students to apply to a university (problem recognition); how and when this decision occurred (information search) and where to attend and why (evaluation of alternatives).

2.2.1 Type of Decision Making

Individuals in recognising an unsatisfied need seek alternatives compatible to satisfying the need. Thus, in making decisions, individuals are involved in different types of decision making. Schiffman et al. (2008) suggest that the buyer's decision-making process varies with the type of decision, and that more complex decisions are likely to involve more buyer deliberation. Therefore, depending on the importance of the decision to the individual, the nature of the decision and context of the decision will influence the time and effort expended. Limited or routine decision making may not demand an individual involves

themselves in undertaking the whole decision making process. In contrast, complex decision making occurs when individuals are highly involved in a purchase decision and are aware of significant differences between brands. Extensive decision making or high involvement will require an application and processing of each phase. Importantly, an individual may choose to enter or leave at any stage of the decision making process.

In terms of preference selection, the vast range of degree courses and universities available to prospective students results in a decision-making process that becomes rather complex (Price, Martzdorf, Smith and Agahi 2003). Moogan and Baron (2003) refer to the process of selection as a complex interactive process. As a result, the process prospective students undertake is characterised by weighing up field of study preferences, the possible courses that fit these preferences and the myriad of institutional characteristics that is attractive to them. Considering this choice availability, the decision making process is also not insular, nor does it necessarily proceed in a linear fashion. James et al. (1999) in their study investigating factors influencing the choices of prospective undergraduates concluded for most students engaging in evaluative choices pertaining to the order of choice, i.e. course–institution or institution–course, the choice is not a linear, two-step decision, but is an iterative process.

2.3 Choice Behaviour Models

A multitude of college choice models developed to understand what influences choice behaviour of prospective students have drawn upon the 'Model of Consumer Decision Making' as a foundation (Mooga and Baron 2003; Harker, Slade and Harker 2001; Moogan, Baron and Harris 1999; Hosler and Gallagher 1989; Stage and Hosler 1987; Chapman 1986). Literature on student college choice and choice behaviour suggests integrated within these multi-attributed models are the interactive effects of internal and external factors influencing a series of interrelated stages shaping students' choices. It appears students progress though these stages in their quest to express their preferences for a desirable degree programs and tertiary institutions.

Prior research suggests choice behaviour occurs through at least three stages (Hossler and Gallagher 1987) (refer to Figure 2.3). This view is supported by Harker et al. (2001, p.2) who assert that it 'appears that potential university students go through a three phase

process when contemplating application to an institution'. However as pointed out by Moogan et al. (1999) and noted by Chapman (1986) the stages of the model do overlap and as to whether student progress in a linear fashion will be also influenced by the students current circumstances. Importantly, a student may also choose to opt out of the college choice process at any stage. Chapman (1986) in examining college choice behaviour, introduces a five stage model of the college selection process (refer to Figure 2.4).

Figure 2.3: A Model of the 'College Choice Process' (Hossler and Gallagher 1987)

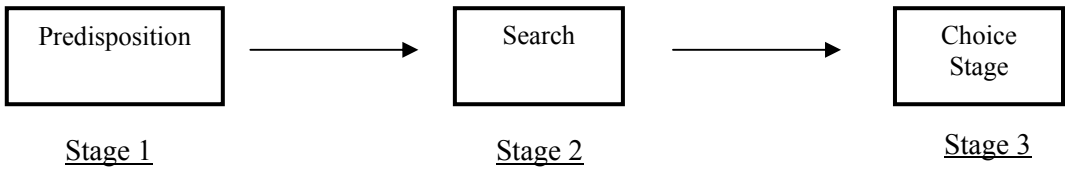
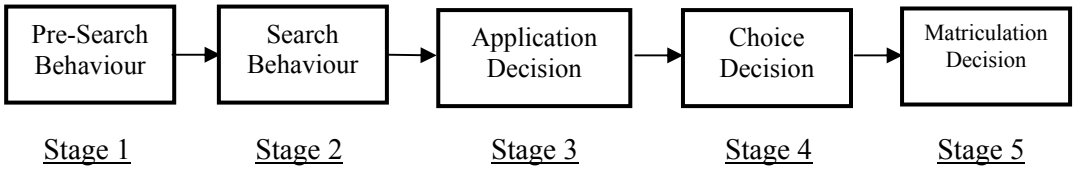


Figure 2.4: A Model of the 'College Selection Process' (Chapman 1986)



The first stage Hossler and Gallagher (1987) refer to in their model of the 'College Choice Process' is predisposition. At this stage, some students develop aspirations for college attendance. The premise underlying this stage is if a student is able to maintain high aspirations for college attendance during the high school years, this will increase the likelihood of high educational attainment. Harker et al. (2001) and Chapman (1981) discuss student characteristics of socioeconomic status of the applicant, aptitude, and the level of educational aspiration as influencing factors upon the student's predisposition to attend university. Also noted of importance is the external influence of 'significant others' such as parents, friends and teachers upon the student's aspirations and thus their predisposition to attend university. Stage and Hosler (1988) also argue background as family income; education and parental expectations are of influence upon a prospective student's choice behaviour.

Chapman (1986) refers to this initial stage as pre-search which primarily focuses on the decision of whether higher education should be pursued. When this process of contemplating tertiary education begins is unclear, however from results of a study conducted by James et al. (1999) it suggests that a feasible 'course-institution' combination is established quite early on, perhaps not with precision but in more general terms. Pervasive influences of this initial stage and subsequent stages of selection behaviour include demographic variables and fundamental determinants which include lifestyle, personal values and culture. In fact, Desiderato, Totten, Ley and Meisenheimer (2002) reported the academic values students hold about college significantly influences students' selection of majors and electives, the amount and kind of effort they invest in academic activities as opposed to employment or other extracurricular activities, and how engaged they are in campus life. This is attributable to the fact that values provide an abstract set of behaviour-guiding principles (Rokeach 1973).

Akin to Harker et al. (2001), Hossler and Gallagher (1987) and Chapman (1986), the second stage is referred to as search. This is where a student gains information that assists in their evaluation of various characteristics of institutions for the purpose of identifying a good personal fit. At this stage, the decision to pursue higher education had been made by the prospective applicant. Therefore a student's underlying motivation to study will impel them to search for information to satisfy their desire to enrol (Bogler and Somech 2002). Motivation to proceed to higher education may be driven by a variety of factors (Byrne and Flood 2005). Implicit also to this search stage, is a need for prospective students to develop evaluative criteria based on identifying the 'right attributes'. Such attributes can include among other things, the reputation of the university, course content, location (Moogan and Barron 2003), cost, job placement after graduation, perceived quality of faculty, degree programs, variety of offerings and classroom instruction (Broekemier 2002). Accordingly, these attributes are not expected to be the same for all students. For a given applicant, a preferred tertiary course represents a complex aggregate personal field of study interests, the perceived characteristics of the relevant course in the intended university, and the wider qualities of that institution (Price et al. 2003).

The notion of complexity impacts not only on the prospective student in terms of choices and gaining admission to their course of first preference, but also on the 'university response to changing government priorities' (Krause et al. 2005, p.16). Conway, Mackay

and Yorke (1994) note that college education calls for an extreme level of involvement from its consumer (the student). This is attributed to purchase being usually an important lifetime decision and the product is intangible with many costs other than money. Moogan et al. (1999, p.222) summarise this point succinctly through stating 'there is a great deal of risk associated with choosing the right course and selecting the right institution'.

The third and last stage of the selection process proposed by Hossler and Gallagher (1987) is labeled the choice stage. This is when elimination of alternatives from a choice set occurs and attention is turned to a particular institution. Chapman (1986) does not consider the choice decision stage that signifies a decision has been made by the prospective applicant until stage four (refer to Figure 2.4). In exercising choices, prospective students not only make decisions with significant implications for their future lives and careers, but also influence planning and directions at a university level (James et al. 1999). Therefore key research questions stemming from this stage include: What is the relative importance of various factors in the choice process? How do these relative importances vary across students?

Stage three in Chapman's model (1986) is the application decision which signifies search behaviour has ended when students decide upon a set of preferences. A key question posed by Chapman (1986) relating to this stage is: What are the determining factors in a student's initial preference for colleges to which applications have been submitted? Harvey-Beavis and Elsworth (1998, p.53) found applicants' 'first preference is a fair guide to an applicant's field of interest' and established an association between measured interests and preferences for particular fields of study. This finding was supported by a follow up study conducted by James et al. (1999) that showed the majority of prospective university students in Australia are motivated principally by field of study interests when they make their initial tertiary applications. Worthington and Higgs (2004) also showed that the level of student interest in a profession is seen as a major factor in the choice of a particular major, in this case economics. Preference as considered in this thesis pertains to whether a student's first preference influenced the selection of a particular portfolio to enrol in.

Chapman's (1986) fifth and last stage is the matriculation decision where there is actual take up of a preferred tertiary institution as expressed in a student's application decision. Prospective student 'take up' rates, sequential university attendance and potential attrition

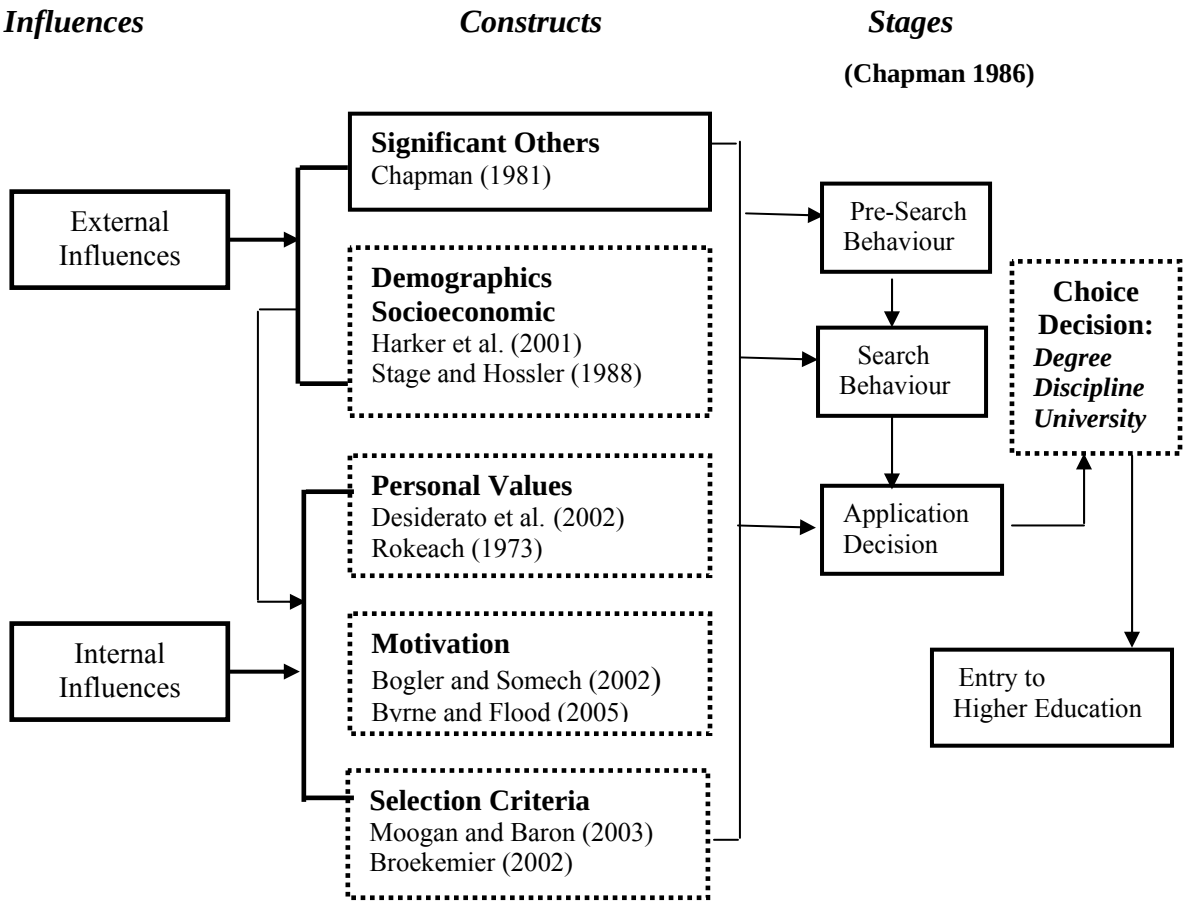
rates are of utmost relevance in terms of funding expenditures of both universities and government. A recent report undertaken by Long et al. (2006) on first year university students' attrition rates suggested movement between courses appeared to be the result of the students constructing their own pathways to preferred university studies. The authors further argue that while some transition is due to students changing their mind about their own interests, and longer-term career aspirations, it appears, a substantial element of movement between universities is associated with students moving to a university they perceive as more prestigious, offering better career prospects, or to the course and career they now want.

2.3.1 Summary of Multi-attribute Models

Figure 2.5 depicts an overview of an expanded conceptual model of choice behaviour emanating from a review of literature (Byrne and Flood 2005; Moogan and Barron 2003; Broekemier 2002; Bogler and Somech 2002; Desiderato et al. 2002; Harker et al. 2001; Stage and Hossler 1988; Chapman 1981; Rokeach 1973). This proposed extended model is adapted from Chapman's 'College Selection Process' (1986) and further developed to incorporate influences from literature. This framework forms the foundation of the proposed conceptual model (refer to Figure 2.7).

Without question, two underlying dimensions appear to emerge, those of *external and internal* constructs as drivers on choice behaviour once a decision to pursue higher education is made. Additionally, such a framework provides insightful information to educational marketers that will direct the formulation of marketing strategies through providing insight into the stages leading to choice behaviour and into what attributes students deem important (Joseph and Joseph 1998).

Figure 2.5: An Overview of an Expanded Conceptual Model of Choice Behaviour



Clearly, the implications of a prospective student's choice behaviour are paramount to educational marketers. Universities must remain globally competitive to ensure sustainability. In a higher education context, strategically, one of the most important objectives of any university is attracting and retaining students suited to the courses offered (Veloutsou et al. 2004), whereby there is a good match between student values and college characteristics (Cain and McClintock 1984). A student's preferred course set represents the courses that best match each individual's personal interests, career objectives and judgment of attainability (Long et al. 2006). Accordingly, in such a competitive marketplace, there is an expectation universities will aim towards developing 'niches' and to seek actively to influence student choice by intensifying their marketing endeavours (James et al. 1999).

The following section discusses in detail the proposed theoretical constructs and the causal inferences of personal values, motivation, and selection criteria towards choice behaviour. An educational setting provides an appropriate context for testing the interrelationships among the three constructs. Consideration is also given to demographic and socioeconomics factors in the context of choice behaviour when making causal inferences in a logit model.

2.4 Personal Values

The underlying foundation of much of the marketing research in the area of marketing and consumer behaviour and value research is based on the seminal work of Milton Rokeach (1968; 1973). Until the research conducted by Rokeach during the 1960s and 1970s, many of the studies that examined values classified them as a sub-category of attitudes (Chryssohoidis and Krystallis 2005). While there is no universally accepted definition of what is a value, there is widespread agreement regarding the major elements a conceptual definition of values should contain. Central to most definitions of values is that it is a belief, enduring and of an abstract nature (Shrum, McCarty and Loeffler 1990; Schwartz 1994).

Arguably, values provide potentially powerful explanations of human behaviour because they serve to guide actions, attitudes, judgments as standards of conduct and comparisons across specific objects and situations and tend to be limited in number (Daghfous, Petrof and Pons 1999; Long and Schiffman 2000; Kropp, Lavack and Silvera 2005). Indeed, personal values are often considered to be the underlying determinant of consumer attitudes and consumption behaviour often serving as standards for conflict resolution and decision making across different contexts (White 2005; Kim, Forsythe, Gu and Moon 2002; Kamauka and Novak 1992). According to Homer and Kahle (1988), the reason values can fulfil such a purpose is that as a type of social cognition, values functions to facilitate adaptation to one's environment whereby individuals are guided about which situation to enter and about and what they do in those situations. Furthermore, Rokeach (1973) contends values exist in a hierarchical interconnected system and therefore provide an abstract set of behaviour-guiding principles.

2.4.1 Measuring Values

Defined as among the most abstract of social cognitions values are considered highly elusive to concretely measure (Kahle 1983). Once a value is learned it becomes part of a value system in which each value is ordered in priority relative to other values (Rokeach 1975, pp.5-11). Throughout their lifetime, individuals will learn to form a system of value priorities reflecting the importance of each value relative to the other (Schwartz 1994). That is, while all values are important and linked together, some values are more important than others**.** Such a hierarchically organised system facilitates the selection and maintenance of the ends or goals and at the same time regulates the manner in which this striving takes place (Guttnam and Vinson 1979). Thus different experiences confronted in different situations will tend to activate more than one value and often involve a conflict between such values. For example, such as a conflict between striving for salvation and hedonistic pleasure, the individual relies on his or her value system to resolve the conflict so that self-esteem can be maintained or enhanced (Kamakura and Mazzon 1991). Within a given context, typically several values within a person's value system rather than single values will be activated.

In measuring values, it is a combination or a list of values that is considered more effective rather than a single value (Kamakura and Mazzon 1991; Kahle and Kennedy 1989) in providing a comprehensive overview of the motivational forces driving an individual's belief, attitude and behaviour. Schwartz and Bilsky (1987) concur, arguing the influence of a person's whole value system was more effective in explaining attitudes and behaviour as opposed to information attained from a single value.

2.4.2 Measurement Instruments

The most widely known and applied method of measurement may be attributed to Rokeach (1973). The Rokeach value system (RVS) (Rokeach 1973) measures both instrumental beliefs about desired modes of action, such as being independent or ambitious and terminal values (beliefs about desired end states such as freedom and a comfortable life). Rokeach describes the two sets of values as representing two separate yet functionally interconnected systems, wherein all the values concerning modes of behaviour are instrumental to the attainment of all the values concerning end states. That is, one mode of

behaviour may be instrumental to the attainment of one terminal value. Therefore, personal values generally correspond to terminal values, while values of desirable activities are comparable to instrumental values. However, criticism of the RVS such as limitation of rank orderings, difficulty of the lengthy ranking task, and questionable relevance of all the values to daily life (Homer and Kahle 1988), have led to the development of a number of other general inventories emanating from RVS.

Another measurement system is the values and lifestyle which originated from a theoretical base of Maslow's (1954) needs hierarchy. VALS facilitates the classification of people into one of nine lifestyle groups (Mitchell 1983). As a tool of segmentation widely used in a commercial setting, its investigation in an academic application has been limited (Novak and MacEnvoy 1990). Kahle, Beatty and Homer (1986, p. 375) in evaluating the predictive ability of VALS in terms of consumer behaviour trends suggested an alternative inventory of List of Values (LOV) as a 'preferable means to examine values structures'.

The List of Values (LOV) was developed by researchers at the University of Michigan Survey Research Centre (Kahle 1983). LOV has a theoretical basis from Maslow's (1954) and Rokeach's (1973) theories and has been widely used to study the influence of social values on consumption behaviour (Shoham, Florenthal, Rose and Kropp 1998). It is an abbreviated inventory and a reduced list of nine terminal values is used which considerably simplifies the ranking task of 18 RVS values. The list of values include: a sense of belonging, excitement, fun and enjoyment in life, warm relationships with others, self-fulfilment, being well respected, sense of accomplishment, security, and self-respect. Two of the items in the LOV (sense of accomplishment and self-respect) are identical to RVS items; the remaining LOV items either combine several RVS items or generalize a specific RVS item (Schwartz and Bilsky 1987). Kahle and Kennedy (1989) stated LOV could serve as a key value measurement instrument in the study of consumer similarities and differences. Another advantage of LOV is its ability to separate the influence of demographics and values on consumer behaviour.

A further application of the nine LOV values emerged from Schwartz (1992) inventory. The inventory proposed a psychological structure of values in terms of seven motivational domains. Embedded within this framework are the nine LOV item and RVS terminal values of wisdom, mature love, true friendship, and a world of beauty. The motivational domains characterised by their own motivational goals include:

- hedonism (i.e. a comfortable life, a pleasurable life);
- stimulation (i.e. an exciting, varied and daring life);
- achievement (i.e. a sense of accomplishment, ambitious, capable);
- self-direction (i.e. independent, imaginative, intellectual);
- social power (i.e. social power, recognition);
- tradition (i.e. honouring elders and respecting tradition);
- conformity (i.e. obedient, politeness);
- security (i.e. family security, national security);
- benevolence (i.e. forgiving, helpful, loving, honest, friendship, love);
- universalism (i.e. equality, a world of peace, social justice, inner harmony, wisdom, self-respect, a world of beauty, broadminded) (Allen 2001).

2.4.3 Application of Values

Values have been shown to correlate with numerous behaviours prompting extensive literature and research studies evident across a range of disciplines and theories. Previous research (Williams 1979; Carman 1977) held that values function as grounds for behavioural decisions in general and consumption behaviours in particular. Hence to explain the relationship between values and behaviour, a number of investigations across the disciplines of psychology, sociology, organisational behaviour have led to a variety of behavioural phenomena such as automobile purchase (Henry 1976), product choices (Homer and Kahle 1988; Pitts and Woodside, 1984), influence on travel decisions (Pitts and Woodside 1986), gift giving (Beatty, Kahle and Homer 1991), media usage (Kau, Keng and Liu 1997; McCarty and Shrum 1993), bank selection (Karjaluoto 2002; Almossawi 2001; Ta and Har 2000), store selection (Kim et al. 2002; Shim and Eastlick 1998), organic food purchase (Baker, Thompson and Engelken 2004) and education (Desiderato et al. 2002).

Clearly, the fundamental theoretical premise underlying research into values and behaviour is the view that values *do* play an important role in human behaviour and drive an individual's behaviour (Luna and Gupta 2001; Pitts and Woodside 1984; Munson 1984). This theoretical notion was reinforced by Desiderato et al. (2002, p.144) who assert 'since it is widely acknowledged that attitudes greatly influence behaviour, it follows that the values and expectations that students hold regarding higher education will greatly impact how they approach their educational experience'.

However, as to whether values have a *direct or indirect* causal influence on subsequent behaviour has led to a number of investigations (Jayawardhena 2004) and prompted the development of causal models to test such relationships. Although some research has implied correlations between values and consumer behaviour (Vinson, Scott and Lamont 1977; Henry 1976), the empirical relation between personal values and behaviour is generally low (Shrum et al. 1990; Munson 1984). A study conducted by Pitts and Woodside (1983) to investigate evidence of a hierarchical relationship found a strong relationship between values and attitude, however a very weak relationship between values and behaviour variables.

2.5 Development of Hierarchy Model

Where it is argued values have only an indirect effect on behavioural decisions, other constructs 'mediators' or 'moderators' are introduced in order to explain this relationship, or to 'bridge the gap' with different mediating constructs (Honkanen and Verplanken 2004, Brunso, Scholderer and Grunert 2004). The psychological field representing the internal constructs (motivation, perception, learning, personality and attitudes) has been widely used to verify the hierarchical flow of values, a mediator and behaviour. In fact, Brunso et al. (2004) in their study on whether lifestyle is a strict mediator of the value-to-behaviour relation outlined a theory predicting the absence of a direct value-to-behaviour link and that lifestyle is a strict mediator of the relationship between values and behaviour. Baron and Kenny (1986, p. 1178) provide further insight into mediating variables. They argue such variables are typically introduced when 'there is a weak or inconsistent relationship between a predictor and a criterion variable'. Indeed a study by Homer and Kahle (1988) in the context of a shopping mall reaffirmed the argument that personal values had only an indirect effect on (shopping mall) behaviour via (mall) attitudes.

According to Homer and Kahle (1988, p. 638), the value-attitude-behaviour hierarchy model implies that 'the influence should theoretically flow from abstract values to mid-range attitudes to specific behaviours'.

This sequence can be called the 'value – attitude – behaviour' hierarchy.

Value ⟹ *Attitude* ⟹ *Behaviour* Hierarchy

In testing the causal model of' 'value-attitude-behaviour' hierarchy, the authors verified the causal relationship underlying the 'value-attitude-behaviour' hierarchy in the very specific context of natural food shopping. Reflective of Rokeach's hierarchical organisation of values, it was found that values varied in terms of importance of others in value fulfilment. Of the three value dimensions measured by the LOV, two were positively related to favourable attitudes toward natural food shopping. A series of multivariate and structural equations supported the causal hypotheses that values have *internal* and *external* dimensions that influence attitudes and attitudes influence behaviour through mediating the value- behaviour relationship. Homer and Kahle (1988) emphasised the most notable contribution of their analyses was the findings concerning the interrelationships among values, attitude and behaviour.

External and internal values clearly differentiate in the direction and purpose of their outcome. According to Kropp et al. (2005) internal values do not require the judgments or opinions of others. Individuals who rate internal values highly are predominantly internally motivated, believing that they can influence or control outcomes. In contrast, external values generally require the presence, judgments, or opinions of others. Furthermore an externally oriented individual tends to rely more on fate and luck for success, relying on external forces to determine solutions to problems (Madrigal and Kahle 1994). Interpersonal values combine some aspects of both internal and external values, however, by definition; they focus upon interactions between people.

2.5.1 Applications of the Value Attitude Behaviour Model

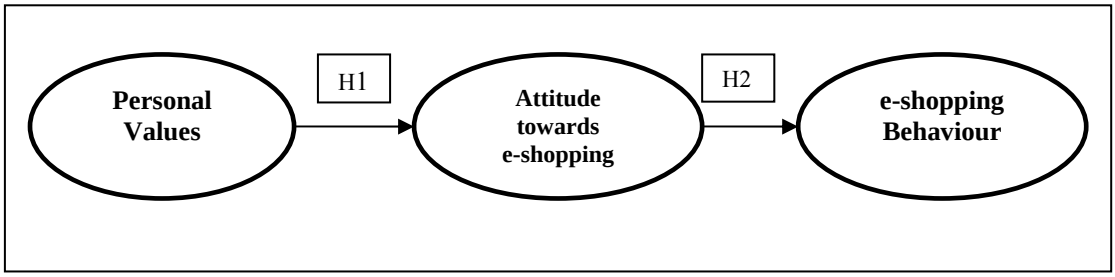
Homer and Kahle (1988) cautioned researchers presenting correlational evidence as a support for the 'values–behaviour' relationship. They further qualify the lack of causal analysis of values is probably more a function of the research design and statistical limitations than the theoretical beliefs underpinning the research. Typically analysis on values has occurred at a univariate level. Homer and Kahle (1988) also suggested that this

'value-attitude-behaviour' hierarchical model should be tested in different situations. Two subsequent studies, Shim and Eastlick (1998) and Jayawardhena (2004), which both applied the 'values-attitude–behaviour' model, also adopted a causal methodology of structural equation modeling.

Shim and Eastlick (1998) investigated the possible causal relationship underlying value, attitude and behaviour in the context of a shopping mall. The primary objective of this study was to employ a 'value-attitude-behaviour' model in order to investigate the role personal values play in the patronage of regional shopping malls. The outcome of the study found two dimensions of personal values (social affiliation and self-actualising values) had significant positive association with shopping behaviour at regional malls for Anglo and Hispanic shoppers. In other words, a favourable attitude had a direct influence on mall shopping behaviour whereas personal values had only an indirect effect on mall shopping behaviour via attitude.

Jayawardhena (2004) applied the 'value-attitude-behaviour' model through a hypothesised model (see Figure 2.6) to investigate the role of personal values as an influence on e-shopping behaviour. Two pathways of influence were proposed that of (H1): personal values to attitude and: (H2) attitudes to behaviour.

Figure 2.6: Hypothesised model (Jayawardhena 2004)



The research outcomes showed personal values only had an indirect effect on e-shopping behaviour through attitude, concurring with the Homer and Kahle (1988) theoretical premise. The study confirmed three dimensions of personal values namely self direction, enjoyment and self achievement that e-shoppers significantly associated to a favourable attitude towards e-shopping attributes. This attitude in turn had a direct influence on

e-shopping behaviour. Of relevance to influencing consumer behaviour, e-tailers need to consider in the planning of website, merchandising and service attributes, appealing to the three dimensions of personal values of e-shoppers identified in Jayawardhena's (2004) study.

2.5.2 Relevance of Values in Choice Behaviour

The use of values and values systems has found broad application as a market segmentation tool (Pitts and Woodside 1983; Kahle et al. 1986). Howard and Woodside (cited in Pitts and Woodside 1984, p.4) contend that consumers can be grouped according to the degree of similarity of their value systems. That is, that groups and individuals with similar values will provide groups with similar choice criteria and final behaviour. An awareness of the value orientations held by a specific group may help in understanding, explaining, or perhaps predicting subsequent attitudes and behaviour (Munson and McIntyre 1978).

Furthermore, from both a consumers' and a practitioners' perspective, values are extremely relevant, as they are desirable goals that serve as guiding principles in people's lives (Schwartz 1994). The role of values as that of standard or criterion used in the formulation of attitudes and guidance of behaviour is particularly relevant for marketers. Values impact choice criteria and are instrumental in determining benefit segmentation (Pitts and Woodside 1984). The characteristics and/or attributes of a product and/or service which the buyer finds to be important are referred to as choice criteria. According to Pitts and Woodside (1984, p.5), 'the key point is that different consumers form different choice criteria according to their value systems'. Therefore using values to complement the more traditional segmentation variables as demographics can achieve greater precision and effectiveness in market segmentation (Vinson et al. 1977). McCarty and Shrum (1993, p.78) describe lifestyle and value information as 'fleshing out' the consumer of a product or brand category in a way, 'sterile demographic' information cannot.

Muller (1991) applied personal values as a basis for developing profiles for various segments in an international tourist market. The aim of the research was to demonstrate the usefulness of profiling international visitor segments in such a way that the importance of various tourism destinations could be attributed to specific value orientations. Prakash (1984) proposed a conceptual framework based on personal values for segmentation of the

women's market in particular for fashion clothing and automobiles and as a vehicle for identifying and developing advertising strategies.

Beatty et al. (1991, p.150), in investigating the linkage between gift giving behaviour and personal values, present a comparable outcome based on theoretical reasoning. Particular values segments are more likely to engage in gift giving behaviours than are other segments. In view of that, certain values are associated with certain gift giving behaviours. The findings suggested two value segments based on *self respect* and *warm relationships* gave more gifts and exerted more effort in gift giving. In terms of implications for marketers appealing to these two segments in a retail environment may elicit a more favourable consumption outcome in terms of more gift giving. However, given values develop from life experience; it is the articulation of these abstractions which will influence attitudes, which in turn influence behaviours such as gift giving behaviours.

According to Schwartz and Bilsky (1987), personal value systems explain an individual's motivation. For the reason that values are centrally held interconnected cognitive elements, they stimulate motivation for behavioural response (Vinson et al. 1977). In response to this, consumers are impelled to act and to engage in behaviours which will enhance the achievement of certain values; similarly, they are motivated to avoid those behaviours which are perceived to block the attainment, of certain value states (Guttnan and Vinson 1979, p.336).

Generally, irrespective of whether by inference or direct measure, the influence of personal values have shown to theoretically flow from abstract values to need range constructs to specific behaviours (Kahle 1980). Allen and Ng (1999) argue most current models of the influence of values on choice are variations of the 'value-attitude-behaviour hierarchy'. Some models suggest the influence of values occurs via an intervening variable such as attitudes, while others propose there is a direct relationship with the attributes t). Therefore, one can hypothesise that:

H1a: There is a direct and positive relationship between personal values and motivation.

H1b: There is a direct and positive relationship between personal values and selection criteria.

H1c: That motivation will mediate the influence of values on selection criteria.

H3a: Students' choice of personal values as underlying drivers will be positively associated with a student's particular preference selection set.

In summary, this section has investigated the range of personal values which drive a prospective student's choice behaviour. As one construct in a hierarchy relationship, personal values theoretically contribute to understanding the choice behaviour that drives preferences. Jolibert and Baumgartner (1997) argue however, it is a combination of values, motivation and personal goals that is of great interest to marketing and consumer researchers as underlying determinants of choice criteria. Pitts and Woodside (1986) state values have been shown to be relevant in understanding consumer's motives. The following section of this chapter will therefore provide a theoretical explanation of another construct, that of motivation and relate this construct to empirical findings with choice behaviour in an educational setting.

2.6 Motivation

All behaviour is goal orientated; hence as an underlying force that impels an action, motivation can be regarded as the necessary drive towards maintenance of some stated goals (Schiffman et al. 2008; Analoui 2000). As a psychological construct, motivation can be hypothesised to explain both the energised and directive aspects of human behaviour. In other words, motivation can instigate behaviour directing an individual towards engaging in a decision process to satisfy a desired internal need. Furthermore, the intensity of the drive to achieve a given, perceived or assumed goal determines the total effort invested in work (Analoui 2000).

Jin and Kim (2003, p. 398) in their study identifying shopping motives, defined such motives as 'the drivers of behaviour that bring consumers to the marketplace to satisfy their internal needs'. While previous studies empirically tested the relationships among values, attitudes and purchase behaviour, in this thesis, *motivation* instead of attitude will be considered as one of the mediating psychological drivers of choice behaviour. Vallerand et al. (1992, p.1004) assert 'one of the most important psychological concepts in education is

that of motivation, whereby behaviour can be intrinsically motivated, extrinsically motivated or amotivated'.

Similarly, Kim et al. (2002) hypothesised a hierarchy conceptual model substituting *need* instead of attitudes in examining the purchase behaviour in the two Asian consumer markets of China and South Korea. Needs were considered as a part of attitudinal variables measured and considered an antecedent of attitudes and purchase behaviour in establishing a hierarchical linkage of consumer values-needs-behaviours to be satisfied by apparel products. In investigating which values are the strong motivators of needs to be met by apparel in two different country markets, the study suggested self-directed values were the underlying determinant of needs. Importantly, the study suggested 'as consumer values influence product attitudes and purchase behaviour, they may also affect the prioritisation of needs to be met through purchase of particular consumer products' (Kim et al. 2002, p. 482). Thus, gaining insight into the hierarchical relationships of value-needs-purchase behaviour would facilitate effective segmentation on a basis consistent with the types of needs to be met by a particular product class or brand of the target market.

A number of prior studies have set out to examine the motivation behind the major reasons influencing a prospective undergraduate student's decision to proceed to higher education and express preferences for a particular degree course (Long et al. 2006; Byrne and Flood 2005; Krause et al. 2005; Bennett 2004; Bogler and Somech 2002; Fazey and Fazey 2001). A recent Australian study (Krause et al. 2005) concluded underlying motivations for study of Australian undergraduate students have remained largely unchanged over the past decade. In general the literature on student motivation in particular distinguishes broadly between intrinsic (an interest in study for its own sake) and extrinsic (an interest in study because of later outcomes) motivations, with intrinsic motivation generally having a greater effect on longer term outcomes (Long et al. 2006)

2.6.1 Classification of Motivation

According to Vallerand et al. (1992) several conceptual perspectives have been proposed to better understand academic motivation. One theoretical approach of classifying motivation as intrinsic motivation, extrinsic motivation, and amotivation is considered particularly pertinent to education. Subsequently, intrinsic and extrinsic motivation is conceived as

global constructs positioned at opposing ends of an internal-external continuum (Fazey and Fazey 2001).

(1) Intrinsic motivation (IM) refers to engaging in an activity for itself and the pleasure and satisfaction attained from participation. Intrinsic motivation stems from the innate psychological need of confidence and self determination. Thus, activities that allow individuals to experience such feelings will be driven by intrinsic motivation. Furthermore, intrinsically motivated students actively engage in learning out of curiosity, interest or enjoyment, or in order to achieve their own intellectual development and personal goals (Byrne and Flood 2005). Kinman and Kinman (2001) define intrinsically motivated individuals as performing an activity (or pursuit) for no apparent reward except the activist itself and when they perceive their behaviour to be self directed. An intrinsic motive can also derive from a cognitive interest in a particular subject matter (Bennett 2004)

(2) Extrinsic motivation (EM) behaviour pertains to such behaviours which are engaged in as a means to an end, and not for their own sake. Engagement in such behaviours is for the purpose of achieving an external goal. Kinman and Kinman (2001) state extrinsic motivation generally involves a cognitive assessment of some activity as a means to an anticipated outcome.

(3) Amotivation refers to individuals who are neither intrinsically or extrinsically motivated. Such individuals perceive their behaviours are caused by factors beyond their control. A state of becoming 'amotivated' then results when these individuals do not perceive contingencies between outcomes and their own actions.

2.6.2 Measurement Scale

To address the lack of an existing academic scale capable of measuring all three different types of motivation, Vallerand et al. (1989) developed and validated in French the 'Echelle de Motivation on Education' (EME) as a measure of motivation towards education. Translated from the EME scale in English, the Academic Motivation Scale represents a reliable and valid scale in its own right. The scale is made up of seven subscales of four items. Vallerand et al. (1989, p.1016) argued the psychometric properties of AMS 'make it a useful tool in motivation in education settings'.

The AMS consists of three sections; Intrinsic Motivation (IM), Extrinsic Motivation (EM) and Amotivation. The subscales of IM and EM are outlined below.

Subscales of IM include:

1. to know relates to several constructs such as exploration, curiosity, learning goals, intrinsic intellectuality and finally the IM to learn.

2. to accomplish things relates to the fact of engaging in an activity for the pleasure and satisfaction experienced when one attempts to accomplish or create something.

3. to experience stimulation relates to engaging in an activity in order to experience stimulating sensations.

Subscales of EM include:

1. external regulation relates to behaviour regulated through external means as rewards and constraints.

2. introjected regulation relates to when an individual begins to internalise the reasons for his or her actions.

3. identified regulation relates to the extent behaviour becomes valued and judged important for the individual.

2.6.3 Application of the Academic Motivation Scale

Within an educational setting, Fazey and Fazey (2001) investigated motivation as an 'autonomy related psychological characteristic' of first year registration students at the University of Wales in the UK. The *Academic Motivation Scale* (Vallerand et al. 1992) was used to measure students' motivation to study in higher education. The group of students in the sample were clearly motivated for both extrinsic and intrinsic reasons to study and had very low amotivation scores.

Long et al. (2006) applied a modified Vallerand's (1999) Academic Motivation Scale to undertake a study extending on previous research on university attrition and course completion. The primary focus was on the reasons for attrition and tracking the subsequent enrolment and other outcomes of students who discontinue their university studies. Students' top six items when asked the extent to which each of a list of reasons matched their own reasons for enrolling in their course in first semester 2004 indicated the importance of vocational motivation for students. Intrinsic and personal reasons were not as frequently endorsed but also matched the reasons why many students enrolled in their course. Similarly, in a recent investigation of the perceptions of first year students, Byrne and Flood (2005) explored Irish accounting students' motives, preparedness and expectations at the outset of their higher education studies. The study suggested students are primarily motivated to enter higher education predominately driven by twin motives of career aspirations and a desire to develop intellectually.

However there is also evidence of prior research suggesting different classification of motivation impacting on a student's reasons for pursing higher education studies. Bogler and Somech (2002) in exploring students' motives to study and their socialisation tactics at a tertiary institution as predictors of academic achievement and academic satisfaction suggested different typologies. A typology of subcultures was employed to examine the motives of undergraduate students to study at higher education institutions.

The three types of motives were classified as:

1. instrumental which applies to students who attend institutions of higher learning to acquire degrees that pave the way to social and occupational mobility;

2. scholastic, which refers to students driven by intellectual stimulation and purely academic reasons; and

3. social, or collegiate**,** which corresponds to students' aspirations for their social life on campus.

Bennett (2004) investigated 284 first-year undergraduate Business studies students regarding their motives for deciding to participate in higher education. He proposed three motivational orientations suggested by Houle (1961) as 'goal orientation', 'learning

orientation' and 'activity orientated'. Consistent with prior classifications, Bennett (2004) also outlined an alternative taxonomy in classifying motives on the basis of extrinsically (e.g. as earnings prospects, social origin and external pressures) or intrinsically (e.g. as cognitive interest in a particular subject) driven. The taxonomy included:

1. Goal orientation: assumptions about better job prospects, higher pay
2. Learning orientation: concerned the desire to learn for the sheer enjoyment of learning, financial pressures and parental encouragement.
3. Activity orientation: referred to as 'the wish to meet new people' was considered not at all important.

Whitehead, Raffan and Deaney (2006) found three different types of motivation which may influence reasons of going into Higher Education. The three types of motivation broadly reflected that of Vallerand's (1989) classification of motivation into intrinsic, extrinsic and amotivation. The three motivation types were:

1. Enjoying student life (collegian) and the challenge of academic study
2. Going into HE to train for a particular career
3. Responding to encouragement to go into HE in the absence of any clear alternative

In summary, an individual's behaviour, particularly choice behaviour is driven by the interaction of three motivational domains. The psychological construct of motivation functions as an underlying driver in influencing preference behaviour. Thus for example, an extrinsically motivated student will seek a degree program that ultimately rewards, in either career status and/or in earning capacity and a university perceived to deliver on its reputation. Furthermore, theoretically motivation can function as a *mediating* variable moderating the relationship between personal values and selection attributes. The strength of motivation as a predictor variable was applied and tested in a discrete multinomial model. Therefore, the following hypothesis is proposed;

H3b: Students' choice of types of motivation as underlying drivers will be positively associated with a student's particular preference selection set

2.6.4 Overview of Motivation

The theoretical approach adopted in this thesis is that of Vallerand et al. (1999) who classified motivation as intrinsic motivation, extrinsic motivation, and amotivation to provide insight into choice behaviour. The construct of motivation reflects how and why students expressed their preferences towards a degree program and university. Past research of motivational orientations has reinforced Donald's (1999) concept of student motivation being 'polymorphous' containing attitudes, goals, and strategies. The abovementioned types of motivation are only one driver that may be critical in understanding a student's preference selection behaviour. The influence of a prospective student's values system has already been considered. The third driver of the proposed hierarchy model and a discrete student choice model that will be examined in the next section is selection criteria. A theoretical explanation of selection criteria as related to empirical findings and marketing implications will be discussed in the next section.

2.7 Selection Criteria

Evaluative criteria are the various features or benefits a consumer looks for in response to making a decision. Once an individual is motivated towards satisfying a particular need, he/she will engage in a process by which a choice is made through the evaluation of alternatives. Therefore, the evaluative criteria that are relevant and important vary according to the type of decision (Yamamoto 2006). The issue of tertiary institution choice criteria has been widely investigated and researched. The number of studies conducted and published within Australia and internationally examining institutional/course choice are numerous (e.g. Whitehead et al. 2006; Krause et al. 2005; Veloutsou et al. 2004; Gray, Fam and Llanes 2003; Soutar and Turner 2002; Mazzarol and Soutar 2002; Joseph and Joseph 2000; James et al. 1998; Joseph and Joseph 1998; Mazzarol 1998). No one set of most important attributes, however has been arrived at (Joseph and Joseph 1998). Nevertheless, several studies have addressed the issue of students' choice criteria and have identified several determinants and underlying patterns of choice prospective students require and consider as part of their selection process. Furthermore, researchers have become consistent in terms of constructs examined and measures of these constructs (Stage and Rushin 1993).

A comprehensive summary of the choice criteria that consistently rated as important is outlined by Broekemier (2002) and include: programs of study, cost, financial aid scholarships, job placement after graduation, safety and facility, quality teaching, area of study, academic reputation, teacher availability, and perceived quality of faculty, degree programs, cost (tuition and fees), variety of offerings and classroom instruction.

Moogan and Baron (2003) narrowed the various decision making variables to three key variables which resulted from two previous studies, one qualitative and one quantitative (Moogan et al. 1999, Moogan, Baron and Brainbridge 2001). These studies confirmed the variables; 'course content', 'location' and 'reputation' to be influential within HE decision making. Results from a sample size of 674 students suggested 'course content' to be of prime significance with nearly half of the students rating it in first position. This was followed by 'reputation' which ranked at 30% and followed by 'location' at 25%. Furthermore, their research examining variables affecting student choice of Higher Education provide a comprehensive overview of the decision making attributes most important from research emanating from the USA and the UK. The attributes of 'location', 'academic reputation' 'program of study', and 'employment opportunities' or 'career enhancements' appear as important criteria from the US studies. Similarly in the UK, 'program of study' appears to be the main criteria which pupils seem to use in deciding where to study, and 'location' is deemed equally important.

2.7.1 Relevant Selection Criteria

Importantly, the number of evaluative criteria used depends on the type of product and/or service, the individual undertaking the decision and their level of involvement. For routine purchase of products, the level of involvement is low and the numbers of evaluative criteria used are few. As a decision demands higher involvement, the criteria an individual employs to evaluate alternatives expressed in terms of important product/service attributes increases. Hence, given the array of alternatives available to a prospective student in preference selection, the decision making process can become highly involved and complex. For that reason, fourteen attributes (Table 2.1) deemed the most relevant were considered for this research obtained from prior research undertaken in higher education. The listed fourteen attributes were consistently considered by first year undergraduate students' across a number of studies as important in eliminating alternatives in order to reach a final decision (refer to section 3.8.2). Furthermore, originating from a theoretical and empirical

foundation (Veloutsou et al. 2004; Gray et al. 2003; Soutar and Turner 2002; Joseph and Joseph 2000) four underlying dimensions are proposed to exist among the fourteen attributes as underlying factors. The dimensions are specified below:

Table 2.1: Selection Attributes

Attributes	Four Proposed Dimensions
a. University Reputation (Veloutsou et al. 2005; Moogan and Baron 2003; Gray et al. 2003; Broekemier 2002; Soutar and Turner 2002)	1. Reputation : (a) University Reputation (b) Course Suitability (m) Program Reputation (n) Prestige and Status of the University 2. Academic: (e) Cost of Fees (i) University's resources (j) Recreation and other facilities (l) Teaching staff experience and qualifications 3. Entry: (c) Entry requirements (d) Range of Courses available (f) Type of University (h) Location of University 4. External : (g) Family Opinion (k) Job Opportunities after Graduation
b. Course Suitability (Soutar and Turner 2002: Moogan et al. 1999)	
c. Entry requirements (Joseph and Joseph 2000; James et al. 1999)	
d. Range of Courses available; Moogan and Baron 2003)	
e. Cost of Fees (Drewes and Michael 2006; Long 2004; Broekemier 2002 ; Chapman 1982)	
f. Type of University (Krause et al. 2005; Soutar and Turner 2002	
g. Family Opinion (Yamamoto 2006; Soutar and Turner 2002; Chapman 1982	
h. Location of University (Drewes and Michael 2006; Long 2004; Moogan and Baron 2003; Chapman 1981)	
i. University's resources (library, computer labs, and/or classrooms) (Veloutsou et al.. 2004)	
j. Recreation and other facilities available (Broekemier 2002; James et al. 1999)	
k. Job Opportunities after Graduation (Whitehead et al. 2006; Veloutsou et al.. 2004; Soutar and Turner 2002)	
l. Teaching staff experience and qualifications (Soutar and Turner 2002; Broekemier 2002)	
m. Programme Reputation (Broekemier 2002; Joseph and Joseph 1988)	
n. Prestige and status of the University (Whitehead, Raffan and Deaney 2006, Veloutsou et al. 2004: Soutar and Turner 2002; Mazzarol and Soutar 2002 O'Brien and Deans 1996)	

2.7.2 Selection Criteria and Their Implications

Much has been learned about selection criteria, course and higher education institution destination. A number of reports (Long et al. 2006; Krause et al. 2005; McInnis et al. 2000; James et al. 1999; Harvey-Beavis and Elsworth 1998) commissioned to investigate undergraduate students across a broad spectrum have provided a valuable insight into this competitive market.

A report commissioned in 1998 (Harvey-Beavis and Elsworth) found an association between measured interests and preferences for particular fields of study. It appeared demand for tertiary education courses was be driven by the interests of applicants whereby most applicants tended to persist with the field of their first preference in their lower order preferences. The James et al. (1999) findings indicated the field of study preferences are clearly the dominant factor in prospective students' decision-making. In other words, preferences are strongly related to the factors the prospective student considers important in choosing a course and university. For example, Business/Administration/Economics applicants and Engineering applicants were found to be the most instrumentally vocational, focusing more on graduate employment rates, graduate starting salaries, and institutional image and prestige than other applicants. In contrast, Health, Arts and Education applicants are less vocationally focused and appear less influenced overall by specific institutional characteristics.

In 2000, McInnis et al. found intrinsic reasons in a field of study combined with the desire to improve job prospects were high on the agenda of most first year students; around three quarters understood the reasons why they came to university. A recent study (Krause et al. 2005) offered a 'broad snapshot' of a ten year trend period of higher education students. Krause et al. (2005) reported similar continued trends relating to both interest-related and job-related reasons dominating first year commencing students' reasons as important in their decisions to enrol in university study. It appears, overall, first year students continue to see university study as an important means of preparing them for a career as well as an opportunity to pursue study in areas that interest them. Thus their motivations for study have remained largely unchanged over the past decade.

From these research outcomes, there appears to be clear implication different cohorts of students look for different selection attributes. Research results pertaining to choice

behaviour suggest undergraduate students should not be treated as a homogeneous market. Joseph and Joseph (1998) found academically talented students in seeking to pursue higher education, evaluated an institution based on the quality of their programs, physical appearance of the university and social life. Thus, the relevancy of considering selection attributes in choice behaviour becomes evident from a market segmentation perspective. The recruitment of distinct segments with tailor made marketing-mix strategies (James et al. 1999) becomes a pathway to attract and retain potential applicants in the undergraduate market. However, the outcome of an investigation by Soutar and Turner (2002, p. 45) of the relative importance school leavers attach to a list of attributes when choosing to enter a tertiary institution introduces a somewhat opposing perspective. An application of a cluster analysis undertaken on the utility scores estimated in the conjoint analysis to determine if there were groups (or segments) of prospective students for whom different attributes were more important, suggested that this sample was more homogeneous in the way respondents traded off between the various attributes. In other words, high-school leavers seemed to develop their preferences in very similar ways, suggesting that marketing strategies will need to be generic, rather than targeted.

The strength of selection criteria as a predictor variable was applied and tested in a discrete multinomial model. Therefore, the following hypothesis is proposed,

H3c: Students' choice of selection criteria as underlying drivers will be positively associated with a student's particular preference selection set

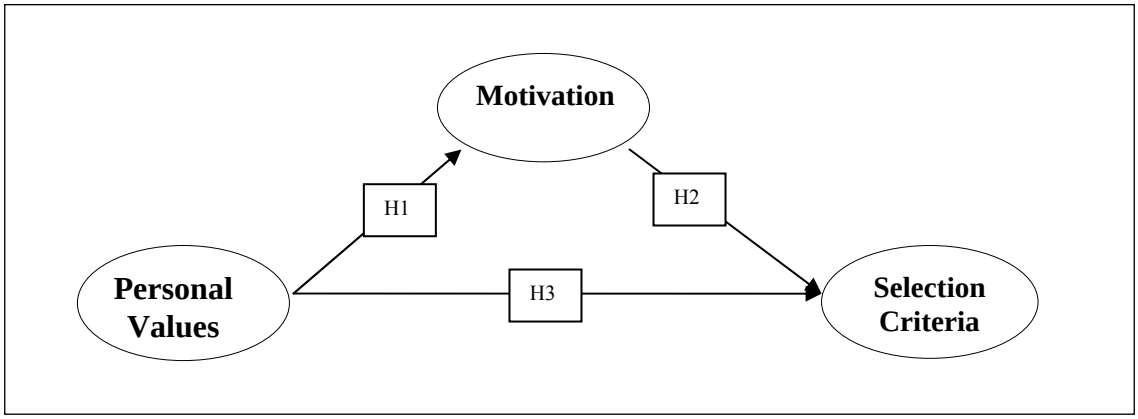
2.8 The Proposed Hierarchy Model

A review of existing literature encompassing the fields of marketing, buyer behaviour, and psychology and education theory has identified a number of constructs influencing the choice behaviour of tertiary applicants. Prior research has investigated interrelationships among values, attitudes, and behaviour and the results indicate that values were shown to have indirect effects on behaviour: values influence attitudes, and attitudes in turn play a mediating role in the values-behaviour relationship (Homer and Kahle 1988, McCarty and Shrum 1993). For this thesis, three explanatory variables were introduced through a causal

research design to establish a proposed hierarchy model. Demographic and socioeconomic factors were considered in the discrete student choice model.

Homer and Kahle's (1988) 'value-attitude-behaviour hierarchy' model was adapted as an anchoring theory. Furthermore, investigating more than two variables also decreases the likelihood of misleading casual influences as a result of looking at simple bivariate relationships (McCarty and Shrum 1993). The proposed hierarchy model is depicted in Figure 2.7.

Figure 2.7: The Proposed Hierarchy Model



In terms of influential pathways, it is theoretically reasonable to hypothesise the three psychological constructs depicted in the above figure explained significant levels of variability in a student's choice as indicated by their preferences. The hierarchy model proposed here is a direct and positive relationship between personal values and motivation (H1) and motivation (Byrne and Flood 2005; Bennett 2004; Bogler and Somech 2002; Fazey and Fazey 2001; Vallerand et al. 1992) has a direct and positive influence upon selection criteria (H2) (Soutar and Turner 2002; Veloutsou et al.. 2004; Joseph and Joseph 2000; Gray et al.. 2003; O'Brien and Deans 1996) influencing the selection preferences of a prospective student. Alternatively, personal values may influence selection criteria directly (H3) or indirectly through mediating 'constructs' such as motivation (H1 $\longrightarrow$ H2).

Contributing to the influence of behaviour are prospective students' characteristics in terms of their demographics, socioeconomic positioning and their preferences. Profile statistics

such as demographics of gender, age, country of birth, education level, income, occupation and background family structure that describe a population can be considered as lifestyle determinants influencing behaviour. There is little doubt the study of demographics and socioeconomic background is an important concept among market and social researchers and policy makers. The study of demographics and socio economic variables postulated as predictor variables upon choice behaviour is evident in past literature. Pitts and Woodside (1983, p. 38) stated homogeneous groups of individuals exhibiting similar values can be differentiated on the basis of their education, income and education. Demographics and socioeconomic variables are discussed below.

2.9. Demographics

A number of studies (Worthington and Higgs 2004; Kau et al. 1997, Carman 1977) have incorporated demographics as both a segmentation basis and as variables in explaining proposed relationships. Shoham et al. (1998) consider both values and demographics useful for developing marketing strategies, and state the importance of examining both variables simultaneously. Vinson et al. (1977) concur stating, that research findings have indicated the importance of personal values to vary by age, education, (family) income and other consumer demographics. In a similar vein, McCarty and Shrum (1993) investigated the extent to which values related to television viewing, in the context of demographic variables. Perusal of the literature pertaining to demographic variables in choice behaviour has been consistent in showing two particular variables to be of relevance and importance, that of *gender* and *age.*

2.9.1. Gender

Krause et al. (2005) examined the role of gender bias in preferences for degree programs. A descriptive observation from their sample indicated there remain large gender imbalances across the major fields of study. Female student over-representation was more marked in Education, Creative Arts and the Health Sciences, while males were over-represented in Management and Commerce, Engineering and Information Technology. Results also found important gender differences, pertaining to the attitudes of the sexes towards their university study. Female students demonstrated more academic orientation, more academic commitment and more satisfaction with their study than their male counterparts. Moreover,

female students were more likely to indicate that their intrinsic interest in the subject area was an important motivating factor for them.

A number of studies proceeded to ascertain if gender balance was in fact significant. Whitehead et al. (2006) found significant gender differences existing on scores results allocated to reasons for going onto Higher Education. The study indicated women were slightly more likely than men to be pursuing higher education because of the academic challenges, enjoyment of the course, and combined with a desire for independence. Goyette and Mullen (2006) investigated the research question: "*Who studies the Arts and Sciences"?* in the context of social background and choice. Application of probit regression models indicated striking gender differences in major choice, whereby men were more likely to choose Mathematics and Mathematics majors, while women preferred the Humanities.

Employing a bivariate probit model, Worthington and Higgs (2004) predicted the choice of an economics major in a sample of first-year, undergraduate Business students in Australia. The paper examined the statistical significance of a number of student-related characteristics on the likelihood of choosing an Economics major, along with the role of student personality and perceptions of the profession. The evidence provided suggested female undergraduate students were less likely to take an introductory economics class, to continue in Economics after completing the first introductory course and to major in Economics than male undergraduates.

2.9.2 Age

For the purpose of comparing student groups in this thesis, 'school leavers' were defined as aged between 17-20 years, and students aged in the 21 plus age category as 'mature aged' students. Krause et al. (2005) found marked attitudinal and motivational differences across the age groups. Mature aged students had set clear directional goals and were driven more by intrinsic motives. Dawes and Brown (2002) considered individual level variables as age, gender, ethnic group, parental education level and a student's academic ability for understanding factors affecting undergraduate students' search process in their choice of a university. Individual factors constituted the explanatory variables potentially impacting a proposed model of brand choice. A regression analysis indicated overall ethnic groups and

age were significant in determining the size of three decision sets. For example, the *age* of a student had a strong positive effect on awareness set size, but a negative effect on the size of the consideration and choice set. In other words, mature aged students were aware of more universities than younger students and were more selective in their applications to universities. Furthermore, the remaining background variables were also found to be significant; male students had a smaller awareness set when compared to female students, and the level of a parent's education influenced a prospective student's search process.

By and large, gender and age are considered to be a significant demographic influence upon the three proposed psychological variables which in turn influence choice behaviour. Country of birth appears to be a potential factor influencing choices (Goyette and Mullen 2006). Therefore one can hypothesise that:

*H2a**:*** Gender is a factor in determining a student's particular preference selection set.

H2b: Age is a factor in determining a student's particular preference selection set.

H2c: Country of birth is a factor in determining a student's particular preference selection set.

2.9.3 Socioeconomic Variables

Chapman (1981) viewed socioeconomic status as a backdrop that influences other attitudes (as educational aspirations and expectations) and behaviours that, in turn are related to college choice. The three measures of occupation, education and wealth are conceptualised as representing socioeconomic status. Although the purpose of this thesis is not to identify socioeconomically disadvantaged students, the impetus for including socio economic variables as student characteristics was the relevancy of socioeconomic factors to both education and occupation. Western, McMillan and Durrington (1988, p.22) argued the socioeconomic status of the household in which a person grows up has been 'theoretically and empirically linked to their later educational and occupational attainments'. Furthermore, the level of education parents attain is expected to be strongly correlated with the student's education. In other words, highly educated parents are more likely to instil

positive values about education to their children and therefore influence their eventual choice behaviour (Dawes and Brown 2002). In terms of occupation, Marks, McMillan, Jones and Ainley (2000, p.7) suggest there is a relationship between socioeconomic background measured by father's occupation and the academic performance of a student. The higher the socioeconomic status or prestige of the occupation as measured on the ANU3[1] scale, the higher the level of student achievement.

Traditionally, emphasis has been given to the mother's level of education as an indicator predicated on the grounds that mothers are more involved with the socialisation of a child and are generally more aware of the child's world at school (Jones 2001). In terms of occupational levels, three different approaches to measuring this variable have been utilised in past research. The first is to use the father's occupation on the basis that a father's occupation is more stable and they are strongly attached to the labour force. It is when information of the father's occupation is missing that a mother's occupation is taken into consideration. A second approach is to use the status occupation of whichever adult has the higher status occupation and a third approach and the one adopted in this thesis is to use both the mother's and father's occupation.

Krause et al. (2005) defined 'socioeconomic status' (SES) on the basis of three groups; lower, medium and higher SES using postcodes. The analysis showed higher SES students are 'disproportionately male' and a pattern indicating parental education levels tend to be at a university achievement level for the higher SES group in comparison to the medium SES level and so on. Similarly, results from Goyette and Mullen (2006) indicated a student's social background strongly influenced his or her selection of a field of study. A disparity on SES score was particularly observable in choice of majors; men in Social Sciences, Business and Engineering had higher SES scores than did women in those fields, while women in Humanities came from more privileged backgrounds.

James et al. (1999, p.42) defined SES as the highest education levels reached by the respondent's parents. On the basis of this measure, however, the findings suggested 'socioeconomic background did not seem to show a strong relationship to applicants'

[1] The ANU3 scale ranges from 0 (low SES) to 100 (high SES). Top of the scale are for example medical practitioners and legal profession and near the bottom of the scale include occupations such as cleaners and related labourers.

reasons for choosing a particular university', but some differences existed between the higher and lower socioeconomic groups.

Prior literature suggests the influence of choice behaviour is associated with the three indicators of socioeconomic status that of parental educational level occupational level and income. The level of parental education (particularly for the mother) and the status of parental occupation appear to strongly correlate with a student's 'choice set' of degree program, discipline and university. In conclusion, it can be hypothesised that:

H2d: A mother's particular educational level is factor in determining a student's particular preference selection set.

H2e: A father's particular educational level is a factor in determining a student's particular preference selection set.

H2f: A mother's occupational status is a factor in determining a student's particular preference selection set.

H2g: A father's occupational status is a factor in determining a student's particular preference selection set.

H2h: Parental combined income levels are a factor in determining a student's particular preference selection set.

A student's level of interest in a particular field of study has been shown to influence their preference behaviour.

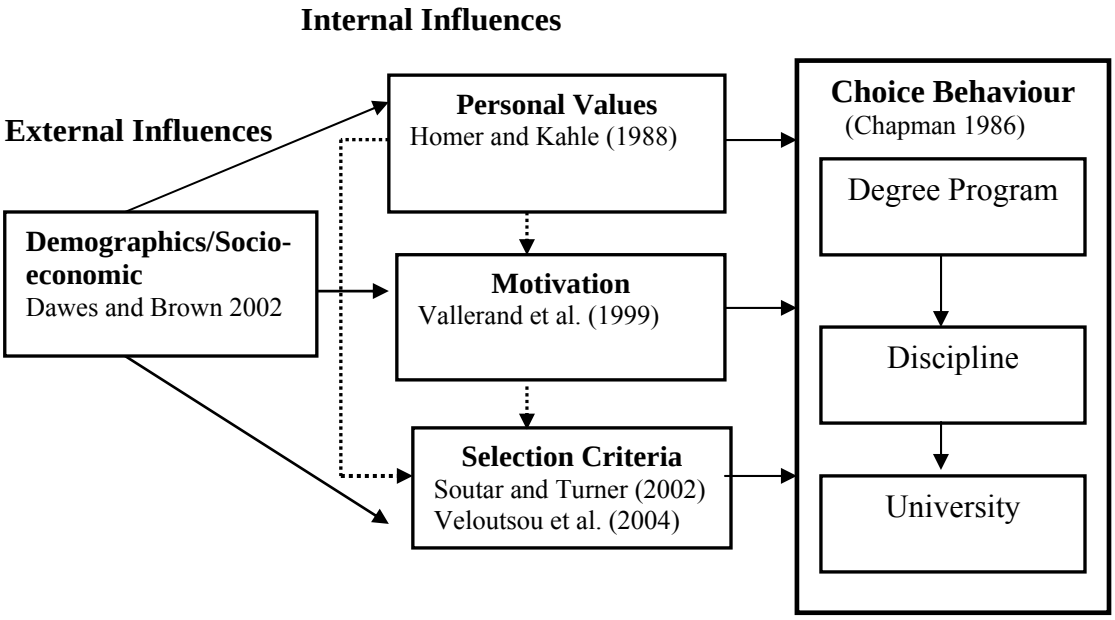
Therefore, one can hypothesise that:

H2i: A student's first preference is a factor in determining a student's particular preference selection set

2.10 A Proposed Conceptual Model

Based on preceding theoretical arguments and empirical findings, a conceptual model is proposed. The investigation of causal pathways in the selection behaviour of undergraduate students is depicted diagrammatically in Figure 2.8. This model provides the theoretical underpinning of this thesis.

Figure 2.8: The Proposed Conceptual Model



The conceptual model proposes a pathway of influence of personal values, motivation, selection criteria and demographic and socioeconomic variables derived from empirical evidence on tertiary student's choice behaviour.

Figure 2.8 depicts the hypothetical conceptual model for assessing the influence of drivers upon prospective student preferences once a decision has been made to enter higher education. In order to investigate how such drivers influence choice of a preferred program, discipline and university, this researcher proposes to model students' choices as

attributable to respondents' psychological variables. In broad terms, the proposed framework indicates four constructs for investigation upon choice behaviour. That demographic and/or socioeconomic factors impact on the three proposed psychological variables which in turn influence choice behaviour. Also postulated are two pathways; personal values directly influences motivation and motivation directly influences selection criteria and; alternatively, personal values influence selection criteria indirectly via motivation mediating this pathway. Both a structural equation modeling and a multinomial logistic approach are applied in the analysis to account for the variability existing in choice behaviour.

2.11 Overview of the Literature of Choice Behaviour

A critical review of literature pertaining to choice behaviour has revealed research identifying a set of the most important selection attributes has predominated past literature. As a result, marketing and behavioural researchers have become consistent in terms of ranking important and relevant attributes. However, research has looked beyond selection criteria and identified a number of other variables that influence choice behaviour. Two underlying dimensions appear to emerge from past literature, those of *external and internal* constructs as drivers on choice behaviour once a decision to pursue higher education is made. *Internal drivers* comprise psychological constructs of personal values, motivation, personality types, interest, perception and selection criteria. *External drivers* are broadly captured by demographic and socio economic factors. Importantly, this research extends the existing literature on choice behaviour by introducing the constructs of *personal values; motivation;* and *demographic and socioeconomic* as the underlying determinants of choice behaviour in an educational context.

Fundamentally, personal values have been shown to be relevant in both understanding and effective predictors of behaviour across different contexts (Maio and Olson 1994; Madrigal 1995). Application in an educational setting should therefore be no different. In fact, Desiderato et al. (2002) reported the values students hold about college significantly impacts how they approach their educational experience. The authors' approach in identifying values as an underlying influence appears consistent to theoretical arguments suggesting values have a causal influence on subsequent behaviours (Homer and Kahle 1988).

Other studies have also recognised the significance of other psychological constructs in explaining choice behaviour; *motivation* (Long et al. 2006; Whitehead et al. 2006; Byrne and Flood 2005; Bennett 2004; Bogler and Somech 2002; Fazey and Fazey 2001; Vallerand et al. 1992); *personality types* (Pike 2006); *interest* (Harvey-Beavis and Elsworth 1998); and *perception* (Worthington and Higgs 2004, Arpan, Raney and Zivnuska 2003). Also prevalent were external influences as *demographic/socio economic factors*; *family influence* (Goyette and Mullen in 2006; Pimpa 2003; Dawes and Brown 2002; Kimweli and Richards 1999).

Furthermore, the contribution to research on choice behaviour is through the introduction of a hierarchy and a discrete student choice model as a vehicle for investigating choice behaviour. A 'value–behaviour' model (Homer and Kahle 1988) will be adapted to determine how the values-behaviour relationship operates, using student preferences as a behavioural example. Importantly, research on 'value- attitude-behaviour' association relies on the ability to determine a priori significant relationships amongst psychological constructs as attitudes upon behaviours (Maio and Olson 1999). The decision to give prominence to *personal values, motivation,* and *selection criteria* stems from research evidence suggesting causal associations amongst these constructs. Dichter (Pitts and Woodside 1984, p.139) provides such an illustration when arguing it is with examining values that a 'more meaningful and interpretative analysis' of the underlying motivation that structure attitudes and behaviour is provided. Unlike previous studies, to test this theoretical framework three fundamental causal relationships are hypothesised. First, between the different dimensions of personal values and the importance of motivational reasons. Second, between the different dimensions of personal values and the importance of selection criteria. Third, between the different dimensions of motivation and the importance of selection criteria. The three hypotheses will be tested by the development of a structural equation model.

Additionally this thesis recognises the recent empirical research of logit models (Drewes and Michael 2006; Long et al. 2006; Worthington and Higgs 2004; Montgomery 2002; Jimenez and Sala-Velasco 2000; Checchi 2000) in educational marketing. Consequently, to account for the variability in choice behaviour of undergraduate students, a discrete student choice model was proposed. Such a model predicted whether the effects of a set of independent variables (personal values, motivation, selection criteria and socio economic factors) hypothesised to drive and explain students' group membership were significant in

differentiating between cohorts of students. The application of a discrete student choice model allows for educational marketers to determine the strength of influence of a number predictor variables have upon a student's choice behaviour. Moreover to effectively market degree programs to prospective students, a multinomial model was instrumental in facilitating the prediction of a 'student type' who expressed a preference to enrol in a particular degree program. Formulation of marketing strategies can then be developed for particular degree programs towards a cohort of a particular 'student types'. The key to effective marketing is recognising factors/attributes relevant among prospective students which will demonstrate a suitable match for degree program offerings at a university. The risks associated with neglecting to consider the student match become evident in terms of disenchantment in program selection and eventual attrition rates (Owen 1977).

2.11.1 Summary of the Literature Research

The drivers and literature introduced in the review are summarised in Table 2.2.

Table 2.2: Summary of Factors driving Choice Behaviour

Drivers	Content	Main Findings
Personal Values	Rokeach 1968, 1973, 1975; Henry 1976; Carman 1977; Vinson, Scott and Lamont 1977; Munson and McIntyre 1978; Guttnan and Vinson 1979; Pitts and Woodside 1984; Munson 1984; Prakash 1984; Pitts and Woodside 1986; Schwartz and Bilsky 1987; Homer and Kahle 1988; Kahle and Kennedy 1989; Shrum et al. 1990; Beatty et al. 1991; Muller 1991; Schwartz 1992; McCarty and Shrum 1993; Kau et al. 1997 ; Jolibert et al. 1997; Keng and Liu 1997; Jolibert and Baumgartner 1997; Shim and Eastlick 1998, Shoham et al. 1998; Kamakura et al. 1999; Daghfous et al. 1999; Allen and Ng 1999; Ta and Har 2000; Long	A <u>value :</u> - is a belief, enduring and of an abstract nature - provide potentially powerful explanations of human behaviour because they serve to guide actions, attitudes, judgments as standards of conduct and comparisons across specific objects and situations and tend to be limited in number - it is a combination or a list of values that is considered more effective rather than a single value - The list of values (LOV) include: a sense of belonging, excitement, fun and enjoyment in life, warm

	and Schiffman 2000; Allen 2001; Almossawi 2001; Karjaluoto 2002; Kim et al. 2002; Desiderato et al. 2002; Baker, Thompson and Engelken 2004 Jayawardhena 2004; Honkanen and Verplanken 2004; Brunsø; Scholderer and Grunert 2004; Chryssohoidis and Krystallis 2005; White 2005; Lages and Fernandes 2005; Luna and Gupta 2005; Kropp et al. 2005;	relationships with others, self-fulfilment, being well respected, sense of accomplishment, security, and self-respect. - have *internal* and *external* dimensions that influence attitudes and attitudes influence behaviour through mediating the value-behaviour relationship - thus sequence can be called the 'value – attitude – behaviour' hierarchy.
Drivers	**Content**	**Main Findings**
Selection Criteria	O'Brien and Deans 1996; Harvey-Beavis and Elsworth 1998 Joseph and Joseph 1998, 2000; Kimwell and Richards 1999; James, Baldwin and McInnis 1999; Jimenez and Sala-Velasco 2000; Joseph and Joseph 2000; Montgomery 2002; Soutar and Turner 2002, Broekemier 2002 Gray, Fam, and Llanes, 2003; Moogan and Baron 2003; Worthington and Higgs 2004; Veloutsou, *et al.* 2004; Veloutsou et al. 2004; Long and Schiffman 2004; Veloutsou et al. 2005; Joseph, Yakhu and Stine 2005; Drewes and Michael 2006; Yamamoto 2006;	Students' choice criteria have identified several determinants and underlying patterns of choice prospective students require and consider as part of their selection process. - A comprehensive summary of the choice criteria that consistently rated as important include: programs of study, cost, financial aid scholarships, job placement after graduation, safety and facility, quality teaching, area of study, academic reputation, teacher availability, and perceived quality of faculty, degree programs, cost (tuition and fees), variety of offerings and classroom instruction.
Motivation	Harvey-Beavis and Elsworth 1998; Vallerand et al. 1992; Donald 1999; Fazey and Fazey 2001; Kinman and Kinman 2001; Bogler and Somech 2002; Kim et al. 2002; Jin and Kim	As a psychological construct, motivation can be hypothesised to explain both the energised and directive aspects of human behaviour

	2003; Bennett 2004; Byrne and Flood 2005; Long, Ferrier and Heagney 2006; Whitehead, Raffan and Deaney 2006;	- one of the most important psychological concepts in education is that of motivation whereby behaviour can be intrinsically motivated, extrinsically motivated or amotivated.
Drivers	**Content**	**Main Findings**
Demographic/ Socioeconomic	Carmen 1977, Chapman 1981; Western et al. 1988; Kau et al. 1997; Kimwell and Richards 1999; Marks et al. 2000; Jones 2001; Dawes and Brown 2002; Pimpa 2003; Worthington and Higgs 2004; Krause et al. 2005; Goyette and Mullen 2006; Whitehead et al. 2006; McCarty and Shrum 1993;	Demographics presents as both a segmentation basis and as variables in explaining proposed relationships. - Profile statistics such as demographics of gender, age, country of birth, education level, income, occupation and background family structure that describe a population can be considered as lifestyle determinants influencing behaviour.

2.11.2 Summary of the Hypotheses

To test the conceptual model within a causal methodology, three sets of hypotheses are proposed. The first set of hypotheses (refer to 2.5.2) propose an underlying causal relationship between the three drivers of personal values; motivation and selection criteria were tested by the development of a structural equation model.

The second set of hypotheses (refer to 2.9.2 and 2.9.3) proposed the likelihood of demographics and socioeconomic variables is an important factor to a particular preference selection set. The use of non-parametric techniques such as chi square test for relatedness

and the Mann-Whitney U test (Wilcox ranks sum W test) facilitated hypothesis testing for the nine hypotheses in set two.

The third set of hypotheses (refer to 2.5.2; 2.6.3; and 2.7.2) proposed the likelihood of psychological constructs being positively associated with students' particular preference selection set and were tested through the development of a discrete student choice model.

2.12 Summary of Literature Review

The interdisciplinary literature contains a multitude of articles on determinants of choice behaviour, that of: *internal* drivers (motivation; personality types; interest; perception and selection criteria) and *external drivers* are broadly captured by demographic and socio economic factors. However only a few have considered how such determinants account for variability when undergraduate students express their preferences for a particular degree course at a particular university. Therefore, this thesis extends the literature on choice behaviour by addressing this gap of examining *how* known drivers influence preferences.

Through developing a causal methodology significant pathways amongst psychological constructs were initially proposed in a hierarchy model. A subsequent discrete choice model determined the strength and significance of the hypothesised drivers facilitating the prediction of 'student types' instrumental in formulating effective marketing communication strategies. Why some student cohorts prefer to enrol in a particular degree program over another has significant implications for tertiary institutions ability to attract and retain students and remain sustainable in a competitive market segment.

Chapter 3

RESEARCH METHODOLOGY

3.1 Introduction

Chapter one introduced the pertinent research questions objectives and potential contribution of this thesis. Chapter two presented an overview of the literature, providing a conceptual frame of reference, a consolidation of a set of underlying constructs, and pertinent guidelines for the formation of the empirical research. The literature review chapter concludes by identifying a pertinent gap in choice behaviour research which is *how* known drivers emanating from past literature influence preferences. Students currently enrolled at RMIT University across three academic portfolios of: Business; Design and Social Context; and Science, Engineering and Technology constituted the sample for this thesis. Guided by the literature emanating from chapter two, this chapter describes the development of the data collecting instrument employed for the main study, the research methodology, and the implementation process. It also details the preliminary exploratory action of item generation taken in a two phase approach of scale development for each construct. Early validation of the measurement instrument through pre-testing constituted the second phase.

The aim of this thesis is to establish a plausible model a priori for understanding the pathways of influence and the drivers of choice behaviour of first year undergraduate

students within an educational context. In Chapter two, this aim was retranslated into a number of research questions and hypotheses which provided direction for the construction of the research approach. As the stated hypotheses identify critical constructs and proposed relationships between these variables, this thesis leans toward employing quantitative methodology.

3.2 Implementation of the Measurement Instrument

3.2.1 The Content

This section describes the content of the questionnaire used for the survey and the process of its development. The research questionnaire used was divided into five sections and was almost exclusively either requesting closed ended responses, and/or preference ratings on Likert-type scales. Open ended probing questions were deliberately omitted from the survey for the sake of ease of administration and to aid time efficiency. The questionnaire structure is summarised in Table 3.1.

Part A: *Preferences for program and university* was designed to elicit a respondent's preferences in terms of selecting a program, discipline and university and the portfolio the respondent was currently enrolled in. The section included six questions of nominal and ordinal data.

Part B: *Selection Criteria Influence Scale (SCIS)* was devoted to measuring 14 selection criteria attributes. The SCIS scale was constructed using a seven point Likert-type scale (1= *not at all important* to 7= *extremely important*). Respondents were requested to rate each statement in terms of importance.

Part C: *Motivatio*n *Influence Scale* (MIS) was devoted to measuring motivation through 17 statements designed to measure intrinsic, extrinsic and amotivation motivation. The MIS scale was constructed using a seven point Likert-type scale (1= *not at all important* to 7= *extremely important*). Respondents were requested to rate each statement in terms of importance.

Part D: *Personal Values-Influence Scale* was measured by nine personal values originating from LOV (Kahle 1983). Each value was measured by five statements, culminating in 45

statements. The PVIS scale was constructed using a seven point Likert-type scale (1= *strongly disagree* to 7= *strongly agree*). Respondents were asked to rate the extent to which they agreed with five parenthetical definitions constructed to measure each personal value. The parenthetical definitions were an outcome of conducting an exploratory survey and were expressed in terms of importance.

Part E: *Profile Variables: Demographics and Socio economic*. The final section of the questionnaire was devoted mainly to determining the demographic characteristics of the respondents for the purposes of classification. They were asked to reveal their gender, age, entry level, country of birth, parent's country of birth, sibling completion of a university degree, parents' highest level of educational attainment, occupation, and the combined household gross personal income.

Table 3.1: Summary of Survey Items and Corresponding Variables.

Part A: Preferences for program and university (six questions)
Part B: Selection Criteria – Latent Variable measured by 14 items (*a* =.788) *How important was the following attributes in your decision to study at a university"?*
Part C :Motivation – Latent Variable measured by 17 items (a=.824) *Please rate how important to you the following reasons were in making your decision to come to a university?"*
Part D: Personal Values- LOV Latent variable measured by nine values (45 items) (a = .940) LOV Homer and Kahle (1988). Each value is represented by five parenthetical statements. *The following is a list of statements some people look for or want out of life. Please read the following statements carefully and indicate to what extent you agree or disagree.*
Part E: Demographics and Socio economic variables- Measured variables Questions related to age, gender, country of birth, parental education, occupation and income

3.3 Description of Sampling Plan

The population of interest for this thesis consisted of all first year undergraduate students enrolled in their first semester of a particular degree program at RMIT University. As elements of the population logically clustered into identifiable cohorts (portfolios), a

cluster sampling approach was used. Each of the three portfolios (Business, Design and Social Context (DSC) and Science and Engineering Technology (SET) represented a cluster. Although cluster sampling is considered more time and cost effective, the chance of sampling error increases due to the assumption respondents within a cluster will display homogenous characteristics. Therefore, in the interests of pursuing a representative and larger sample to negate sampling error, all three clusters were retained. Specific degree programs were selected using a probability technique of simple random sampling from each cluster (see Table 3.2) for surveying. This involved listing all degree programs across all the three portfolios programs to ensure an equal chance of inclusion and randomly selecting from the three clusters. Furthermore, in order to address non response error, surveys were undertaken in the second and third week of the commencement of the first semester when the likelihood of class attendance is assumed to be greater than as the semester progresses.

Table 3.2: Random selection of Programs of Study

Portfolio	**Programs of Study**
Business	Accounting and Law Business Information Technology Economics , Finance and Marketing Management
Design and Social Context (DSC)	Art , Global Studies, Social Science and Planning
Science, Technology and Engineering (SET)	Applied Science/Applied Chemistry, Applied Chemistry/Chemical Engineering and Engineering

Emails seeking permission and interest to participate in the survey were initially sent to the respective Research Directors of the three portfolios of interest. The emails were accompanied by a copy of the questionnaire, a letter of Plain Language Statement and a letter of Ethics approval for the research. Upon receiving permission and approval from the Research Directors, Program coordinators, Course Coordinators and Lecturers were subsequently notified. The data collection process commenced in week two of the first semester of 2007 and was completed over a four week period leading up to week six of the academic semester. Approximately 450 person administered questionnaires were distributed to first year students by the researcher in lectures. The administration of the

survey began with a brief description of the project and instructions about how to complete the survey. Students were advised that their participation was voluntary and confidentiality was assured. Respondents were allocated class time and completed questionnaires were the collected by the researcher. Of the 450 self administered questionnaires, 369 respondents answered the self administered questionnaire of which 304 respondents answered all questions relevant to this thesis indicating a 67% response rate.

Once data collection was finalised, SPSS was used to process and analyse the data. To ensure accuracy of the data, frequency and cross tabulations were produced in the first instance and then inspected for possible errors to screen the data for missing cases. Outliers were identified and profiled to ensure extreme values did not influence results.

3.4 Research Approach

In terms of selecting a relevant research design, this thesis adopted a causal approach facilitating quantitative data analysis. The primary goal of quantitative research is to acquire clearer and more precise theory about relations among predictor variables to therefore gain meaningful insights into hypothesised relationships and verify or validate the existing relationships (Lukas, Hair, Bush and Ortinau 2004). Consideration towards the research approach also demands identifying critical variables and the relationship proposed between these variables. By doing so, conclusions or inferences can be drawn 'about differences in populations on the basis of measurements made on samples of subjects' (Tabachnick and Fidell 2007, p. 7). A quantitative approach is more directly related to descriptive and causal research than to exploratory designs. Moreover, a research outcome of describing and making inferences about a data set typically demands there is an interrelationship between descriptive and causal research. Malhotra, Hall, Shaw and Oppenheim (2008) acknowledge that distinctions among research designs are not absolute and research may incorporate one type of research design in concert with another.

This approach was reflected in this thesis whereby a causal research design was combined with exploratory research. Exploratory research was relevant in the preliminary stage of designing the measurement instrument in generating qualitative data. The objective of gaining insights and understanding of constructs guided the exploratory research. Item generation for scale development constituted the first phase of exploratory research and

early validation of the measurement instrument through pre-testing constituted the second phase.

3.4.1 Hypothesis Testing

Three sets of hypotheses proposed were tested under the different analyses. A preliminary data analysis entailed undertaking descriptive analysis. In addition to the descriptive statistics, the measurement properties of the three scales; Personal Values Influence Scale (PVIS), Motivation Influence Scale (MIS) and Selection Criteria Influence Scale (SCIS) were tested through exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The main study addressed the hypotheses proposed by two distinct but mutually supporting stages in multivariate analysis. Multivariate analysis refers to a statistical approach that simultaneously analyse multiple measurements on each individual or object under study (Hair, Anderson, Tatham and Black 1998). To investigate the role and influence of the psychological variables of personal values, motivation and selection criteria upon choice behaviour, the conceptual model was tested by a structural equation model (SEM) for the significance of the relationships between particular pairs of variables. To generalise the findings of analysis from SEM analysis, multinomial linear regression (MLR) was used to conduct further analysis on the statistically significant effects amongst drivers of choice behaviour. Logit regression was performed using the same set of variables, but also including demographic and socio economic variables. Similarly, Hsieh, Pan and Setiono (2007) prior to applying multilevel regression modeling to examine how consumer perceptions develop on the basis of a firm's advertising appeal, initially explored the dimensionality of brand image perceptions using principal components analysis. The extracted dimensionality was examined using structural equation modeling. Further diagnosis of statistically significant effects occurred through logit regressions. Morikawa and Sasaki (1998) also employed an SEM structural model in concert with a discrete choice model to capture the influence of latent indicators of choice alternatives pertaining to intercity travel.

3.4.2 Data Set

The data set as it relates to inferential analysis must therefore reflect the attributes of metrically measured variables in terms of quantity or degree. Metric data measured on either an interval or ratio scale is capable of taking on any value within the range of scale

whereby the number of the rating indicates the relative magnitude of the variable. For example, Likert scales can take on the properties of ordinal interval scales to indicate the extent to which respondents agree or disagree with a series of belief statements about a given object. In this thesis, three of the four hypothesised drivers (1) personal values, (2) motivation, and (3) selection criteria were measured on such a Likert – type scale with an underlying metric format. Consistent with prior studies (Homer and Kahle 1988; Shim and Eastlick 1998; Jayawardhena 2004), a seven-point category of classification scale rather than a dichotomous or 3 to 6 category Likert-type scale was used. Furthermore, Cohen (1983) argues the frequent procedure in the Behavioural Sciences of dichotomising continuous variables results in the systematic loss of measurement information. Cicchetti, Showalter and Tyrer (1985, p. 35) in their investigation of the extent to which the interrater reliability[2] of a clinical scale is affected by the number of scale points concluded, 'an investigator will sacrifice the most if a dichotomous format is used, will suffer immediately for using 3 to 6 points and will pay the smallest penalty if a 7 point scale is employed'. Non-metric measurement scales can comprise either nominal or ordinal scales resulting in categorical, discrete or dichotomous data output. Variables can be discrete and take on a small number of values. For example designated categories of occupational groups are an example of an ordinal scale indicating a relative position in an ordered series. The fourth hypothesised driver in this thesis (demographic and socioeconomic factors) is measured on both nominal and ordinal scales.

3.4.3 The Independent Variables

Four categories of independent variables were considered as drivers for this thesis. Three of the four were included in the SEM and all four in the MLR model of student preference choice. That is, the thesis investigated the way these independent variables influenced the dependent variable in some way. The first category consisted of *personal values*, with the broad dimensions of internal and external values supporting Kahle's (1983) theoretical and empirical underpinning. The second category pertained to the influence of *motivation* and was subdivided into the three factors; intrinsic motivation, extrinsic motivation and amotivation (Vallerand et al. 1999). Motivational variables were also considered to function as mediator variables. The third category pertained to *selection attributes* deemed important for prospective undergraduate students. The factors belonging to selection

[2] Interrater reliability is the extent to which two or more individuals (coders or raters) agree. Interrater reliability addresses the consistency of the implementation of a rating system.

criteria were the influences of reputation, academic, entry and external (Gray et al. 2003; Joseph and Joseph 2000). The above three categories of independent variables can be considered parametric statistics measured on a continuous scale. The last category consisted of a set of characteristics of *demographic and socio economic* variables. A respondent's gender, age, parental education, occupation and income level were treated as categorical variables measured on an ordinal scale.

3.4.4 The Dependent Variable

In this thesis, the dependent behavioural variable of choosing to enrol in a particular portfolio is a *non*-metric categorical dependent variable. Prediction of membership in one of the three categories of choice outcome (Business portfolio, Design and Social Context portfolio and Science and Engineering and Technology portfolio) is indicative of discrete outcomes and thus relevant to a discrete choice model.

3.5 Approaches to the Analysis: Preliminary

The preliminary data analysis of describing, summarising and grouping the data led to undertaking both descriptive and exploratory factor analysis. A large number of studies pertaining to identifying selection criteria typically employed a descriptive research design with the application of exploratory factor analysis (Whitehead et al. 2006; Veloutsou et al. 2004; Joseph and Joseph 1998; 2000, Kimweli and Richards 1999; Scott and Lamont 1977). The main study addressed the hypotheses proposed through a quantitative approach tested by two distinct but mutually supporting stages in research analysis, that of structural equation modeling and a discrete choice student model. The theoretical foundation of the approach to the analysis is discussed in the next section.

3.5.1. Descriptive Statistics

Descriptive analysis was undertaken with the aim of providing an understanding of the sample and the sample distributions of the various behavioural and demographic variables. Another aim of the descriptive statistics by means of numerical measures of central location and dispersion was to assess how representative the sample was, with respect to preferences of particular programs, disciplines and university. Descriptive analysis also facilitated hypothesis testing through the use of non-parametric techniques as a chi square

test for relatedness and the Mann-Whitney U test (Wilcox ranks sum W test) for the second set of hypotheses proposed (refer to Chapter 2). The second set of hypotheses proposed that the likelihood of demographics and socioeconomic variables is an important influence to a particular preference selection set.

3.5.2 Factor Analysis

Factor analysis is a generic term used to describe a number of methods designed to analyse interrelationships within a set of variables or objects culminating in the specification of factors. The factors are then representative of a 'larger set of observed variables or objects' accounting in essence for the same information (Reymont and Joreskog 1993, p.71).

Accordingly, two major methodologies exist regarding factor analysis: an exploratory and confirmatory perspective. Exploratory Factor Analysis (EFA) is an analysis approach applied to a set of variables to explore data to determine how and to what extent single variables are linked to particular underlying constructs. Relationships between constructs or the number of factors a priori do not need to be specified. Confirmatory factor analysis (CFA) is commonly referred to as the analysis of the measurement model testing theories specified a priori to describe the sample data. CFA is considered a theory-testing when a hypothesis is postulated prior to the analysis. In other words, with a CFA model, the exact number of factors and relationships are initially specified from a strong theoretical and/or empirical foundation. Both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used for this thesis. Confirmatory factor analysis was also employed to test for convergent validity and discriminate validity. The confirmatory factor analysis of these results are presented and discussed in Chapter six.

When the underlying structure of the indicators or number of factors is not well understood, lack of a prior specification in EFA becomes a relative strength (Gerbing and Hamilton 1996). In this thesis, although the number of factors per latent construct was known and thus specified a priori, EFA was undertaken with the objective of examining underlying factor patterns or factor correlations for personal values, motivation and selection criteria constructs. Therefore specification of a measurement model developed in part with EFA was particularly relevant as the psychological constructs of *personal values, motivation and selection criteria* introduced for this thesis have not been previously tested in a hierarchy model, nor has a hierarchy model been applied in an educational context.

In support of this approach, Gerbing and Hamilton (1986, p.71) present a convincing argument of alerting the researcher to the viability of consideration of EFA as a precursor to confirmatory factor analysis (CFA) for theory development and assessment. Confirmatory methods, then attempt through chi square goodness of fit and other fit indices to optimally match the observed and theoretical factor structures for a given data set in order to determine the 'goodness of fit' of the predetermined factor model. In other words, a 'middle ground' methodology partly which is partly exploratory and partly confirmatory (Lages and Fernandez 2005) can effectively employ EFA as a tool in recovering an underlying measurement model, which can then be evaluated with CFA (Gerbing and Hamilton 1986). Golob (2003, p. 4) concurs that 'exploratory factor analysis is sometimes used to guide construction of an SEM measurement model', given the large number of possible combinations in a measurement model.

This approach is more reflective of a model generating technique where a tentative model is specified as opposed to using a strictly confirmatory model where a single model is developed and tested (Joreskog and Sorbom 1993). Cox, Johnstone and Robinson (2006) state SEM is rarely used as a purely confirmatory technique as commonly data may tend to be slightly inconsistent with the hypothesised model, requiring model adjustment and re-estimation of newly defined measures and constructs. Hsei et al. (2007) also advocated a model development strategy in their research on consumer perceptions. Although such a methodology is often criticised for being data driven due to its exploratory nature, the authors argue theory is effective in providing a starting point. Appropriate modifications based on CFA can then facilitate the 'development of a model that is both substantively meaningful and statistically a good fit' (p. 258).

3.6 Approaches to the Analysis: The Main Study

3.6.1 Structural Equation Modeling (SEM)

Structural equation modeling is a statistical methodology that takes a confirmatory (i.e. hypothesis testing) approach to the analysis of a structural theory bearing on some phenomenon' (Byrne 2001, p.3). SEM allows for the investigation of how plausible a model is specified a priori in hypothesising relationships among variables and as to determine whether the model is supported by the data. Furthermore it is the ability of SEM

as a statistical approach to analyse research questions related to causal relationships and links between constructs that becomes particularly relevant for this thesis. The first set of hypotheses for this thesis proposed an underlying causal relationship between the three drivers of personal values, motivation and; selection criteria. From a theoretical perspective, McCarty and Shrum (1993) alert the researcher of the risks when testing simple bivariate relationships of misrepresenting the actual relationships as inferring causality. Consequently, McCarty and Shrum (1993, p. 94) argue what is warranted to better understand the influence of abstract psychological constructs as values and human behaviour, is 'more complex models that include relevant third variables'.

Past studies testing structural equation models with psychological variables have typically employed SEM as a data analysis technique (Jayawardhena 2004; Kim et al. 2002,; Wang and Rao 1995; Shim and Eastlick 1998; Homer and Kahle 1988) to investigate the role personal values play in different contexts. Another supporting argument for the use of SEM is theoretical constructs in behavioural sciences as motivation and attitude cannot be directly observed. Such latent variables can only be measured if directly associated with an observed (indicator) variable. For example a student's motivation for preferring to pursue a particularly degree course cannot be directly observed, however through the measurement of observable or indicator items (as statements in Part C of questionnaire in Appendix) an inference can be made (Webster and Fisher 2001). An advantage of SEM is the ability to specify latent variable models and provide estimates of relations among latent constructs. Multi-item measurement scales can also be effectively assessed (Tomarken and Waller 2005; Wang and Rao 1995).

3.6.2 Approach to SEM

The general SEM can be decomposed into two submodels: a measurement model and a structural model. A measurement model relates the constructs to their measures and the structural model relates the constructs to each other (Jarvis, Mackenzie and Podsakoff 2003). This thesis adopted the recommended two step model building approach by starting with validating and confirming an initial measurement model and then examining the proposed pathways through the structural model (Chitty, Ward and Chua 2007; Yoon and Usyal 2005; Jayawardhena 2004; Homer and Kahle 1988; Anderson and Gerbing 1988). The first step of the analysis involved specifying the measurement model and the

relationships between the observed variables (items) and latent variables or hypothetical constructs (factors).

Two types of measurement models were examined, specifically, that of a one-factor congeneric models and multi- factor models (Webster and Fisher 2001).

3.6.3 Measurement Models -
One Factor-Congeneric Measurement Model

Within the framework of SEM, as part of the measurement model generating phase one-factor congeneric models were initially estimated using AMOS 7 (Jöreskog and Sorbom, 1993) to examine the validity and reliability of the measurement properties of the latent variables of interest. A one-factor congeneric model is one type of measurement model within which a single latent variable (factor) is measured by several observed variables (items) and is considered as the simplest form of a measurement model (Girardi, Soutar and Ward 2007). Latent variables which represent abstract concepts or theoretical constructs are not directly observable or measured must be assessed indirectly or inferred. Schumacker and Lomax (1996) suggest a minimum of three items is required for fitting a congeneric model and computing a latent construct (factor). However, Anderson and Gerbing (1988) acknowledge having multiple indicators for each construct is strongly advocated; however, sometimes in practice a single indicator of some constructs is available.

As a multiple-indicator measurement model, congeneric models also satisfy unidimensionality as each construct was defined by at least two measures and each measure is an estimate of only one construct. In other words, for a model to indicate a good fit, the allocated items must be valid measures of the single latent trait thus qualifying as a 'quasi-test of validity' (Chitty et al. 2007). In particular, for one-factor congeneric models to be accepted, the indicator variables contributing to the overall measurement of the latent variable must be all valid measures of the one latent construct. Thus, from this understanding, construct validity can also be confirmed through evaluating the fit indices of one factor congeneric models.

Once acceptable one factor congeneric models were obtained, further supplementary CFA analysis was conducted. One-factor congeneric measurement model analysis was

consecutively used for computing composite variables to be used in the structural model. A single measured variable was created for each of the latent variables by summing the scores for each of the related measured variables to create composite variables (Cox et al. 2006). Importantly, the unidimensionality and internal consistency of the scale items were tested before they were summed (Byman 2005). An advantage of item composites is parameter estimates become more stable and hence may have greater generalisabilty and also reduces the degree of non normality in the data (Bandalos 2002). The composite items subsequently formed indicators to measure a construct.

Multi Factor Analysis

A multifactor model facilitates the testing of multidimensionality of a theoretical construct (Webster and Fisher 2001). Homer and Kahle (1988) report on several underlying dimensions of personal values including internal/external dimensions and apersonal/personal dimension derived from theoretical and empirical evidence. Therefore, a multi factor model examined the independence of the measurement scales of personal values, motivation and selection criteria by testing for competing factor structures other than unidimensional concepts.

3.6.4 Measurement Model Specification

In the adoption of the two-step model building approach, modifications are customarily made to the measurement model prior to assessing structural relations. Inspecting residuals and modification indices are an appropriate approach of locating model misspecification (Byrne 2001). A review for model misspecification included both residuals and modification indices. Of the residuals, the standardised residuals are the easiest to interpret and in essence represent estimates of the number of standard deviations the observed residuals are from the zero residuals that would exist if the model was a perfect fit. Items displaying large standardised residuals (greater than 2.58) considered responsible for model misspecification and suggestive of a lack of fit were identified and removed (Byrne 2001).

Modification indices (MI) provide information relating to the degree to which the hypothesised model is described. As to whether a model should be respecified and reestimated on the basis of MI is influenced as to whether the parameter change is

substantively meaningful and the consideration of the possibility of proposing an overfitted model. Items with correlated error variances and large standardised residuals were also examined to determine, whether on inspection the items were in fact measuring similar properties where items had in fact a 'high degree of overlap in subject content' (Byrne 2001, p.43) .

Assessment of Fit Indices

In practice the measurement model may sometimes be judged to provide an acceptable fit even though the chi square value is still significant. This judgement should be supported by other fit indices, particularly the root mean square residual index in conjunction with the number of standard residuals (Anderson and Gerbin 1988). The chi-square statistic ($\chi 2$) is by far the most universally reported index of fit in SEM. Tests of model fit, such as the $\chi 2$ test, assess the magnitude of the discrepancy (Hu and Bentler 1995) between the sampled and modelled or fitted covariance matrices.

A nonsignificant $\chi 2$ with associated degrees of freedom indicates that the two matrices do not differ statistically, and is generally indicative of a good model fit (Davey, Salva and Luo 2005). If the model cannot be rejected statistically, it is a plausible representation of the causal structure. However, the chi square statistic should not be the sole basis for determining model fit, particularly as the chi square statistic is affected by sample size and particularly when there is data departure form normality (Reisinger and Turner 1999). Byrne (2001, p.81) argues large sample sizes are 'critical to the obtaining of precise parameter estimates'. She further asserts findings of a well 'fitted hypothesized models where χ^2 approximates the degrees of freedom have proven to be unrealistic in most SEM research'. Bollen and Long (1993) remind the researcher that no single measure of overall fit should be relied on exclusively, be it chi square or any other index to report on multiple fit indices.

To therefore address the potential χ^2 limitations (Kline 2005) of exclusively using the chi-squared measure of absolute fit, other measures of model fit introduced included the comparative fit index (CFI), the Goodness-of –fit index (GFI), the Tucker Lewis index (TLI) and the root mean square error of approximation (RMSEA). The indices of CFI, GFI and TLI ranges from 0-1 with values closer to one are generally considered satisfactory for

an acceptable fit of the model to the data (Turner and Reisinger 2001). As a measure of the lack of the fit of a model, the RMSEA is judged by a value of .05 or less as an indication of a close fit of the model in relation to the degrees of freedom. Additionally, a value of .08 or less is indicative of a reasonable error of approximation, however a model should not be used if it has an RMSEA greater than 0.1. Hu and Bentler (1995) suggested values below .06 for an RMSEA indicate good fit. The Standardized Root Mean Square Residual (SRMR) represents the average value across all standardised residuals and ranges from zero to 1.00, however in a well fitted model this value should be .05 or less (Byrne 2001).

3.6.5 Limitations of SEM in Application

As a data-analytic approach, given SEM has a number of appealing features, it is also imperative to take in to consideration noted limitations. This view is supported by Tomarken and Waller (2005) who alert the researcher to be 'aware of the variety of problematic issues that exists concerning the estimation and testing of parameters' and that it is, 'impossible to prove a model correct as alternative models could fit the data equally well' (p.53).

In a recent study investigating the determinants of banking adoption in Brazil, Hernandez and Mazzon (2007) in acknowledging certain disadvantages associated with SEM employed a MLR model, although the analysis technique of MLR was going against the conventional use of SEM in studies on internet banking studies. Furthermore a MLR model addressed the complexity associated with incorporating non latent and ordinal variables into a structural model. In this thesis, as demographic and socioeconomic variables were treated as categorical variables measured on an ordinal scale, their influence as predictors of choice behaviour were tested in a MLR model.

3.6.6 Sample Size

In order to statistically determine a sample size for the purposes of this research and the analysis methodology, both theoretical prerequisite and empirical research were examined for SEM and MLR. From a theoretical basis, sample size plays an important role in estimating and interpreting SEM results as well as estimating sampling errors. Variations in sample size can influence a number of factors such as bias of parameter estimates, power, likelihood of inadmissible estimates and interact with several other factors as the degree of assumption violation and overall model complexity (Tomarken and Waller 2005). A

recommended minimal sample size applicable in all contexts remains rather elusive (Hair et al. 1998). Anderson and Gerbing (1988) suggest that a sample size of 150 or more typically will be needed to obtain parameter estimates that have standard errors small enough to be of practical use or to overcome a number of inherent limitations resulting in nonconvergence and improper solutions such as negative variance estimates. Golob (2003) argues a minimum sample size of 200 is needed to reduce biases to an acceptable level for any type of SEM estimation. Tomarken and Waller (2005) recommend sample sizes are at least in the 200 range even when relatively simple models (e.g., a confirmatory factor-analytic model with two factors and three to four indicators per factor) are tested. However for more complex models making the assumption of multivariate normality, the recommendation is for a much larger sample size. In this research, a sample size of 304 was used.

3.6.7 Categorical Dependent Variable

Furthermore, the requirement the data is of a continuous scale presents categorical variable methodologies with some restrictions. For this thesis, the dependent behavioural variable of choosing to enrol in a particular portfolio is a *non*-metric categorical dependent variable typically evident in the case of psychological research (Byrne 2001). Within SEM analysis, categorical variables may be treated as if they were continuous variables, however, Byrne (2001, p.72) warns of the risks involved and alerts the researcher to the 'multiplicity of difficulties involved in structuring a SEM program to incorporate' a categorical variable option. The alternative option to test an SEM model independently for the three separate groups of categorical variables demands the need for large sample sizes for each group. In this thesis, given the sample sizes for each group, (Business n =128; DSC n =87; and SET n = 89) such an approach was not considered appropriate.

3.6.8 Multivariate Normality

Maximum likelihood (ML) is a general method of parameter estimation. Goodness of fit is assessed by finding parameter values of a model that best fits the data (Myung 2003). One of the key assumptions when maximum likelihood (ML) is used in SEM is that of multivariate normality; an assumption that is considerably more restrictive than univariate normality (Tomarken and Waller 2005). This is particularly relevant when dealing with data emanating from psychological research which is often poorly characterized by the

normal distribution. Even in data samples stemming from multi disciplines, Tabachnick and Fidell (2007) note some variables still tend to be highly skewed even after transformation and in fact some variables (such as drug use) are not expected to be normally distributed. In a recent study examining the effects of long term depression and anxiety on the psychological construct of hope, Arnau et al. (2007) did not factor in the value of the chi-square statistic in evaluating the parameter estimation. This was driven by the fact that as a prerequisite for the chi-square test, the ML test statistic tends to reject true models when dealing with nonnormal data more frequently than the nominal (0.05) rejection rate (Fouladi 2000).

3.6.9 Multinomial Logistic Regression (MLR)

A logistic regression model is a class of regression where the outcome variable can be binary or dichotomous and the independent variables are continuous variables, categorical variables or both. In cases where there exists a dependent categorical variable that has two values such as 'chosen' and 'not chosen' rather than continuous, this is referred to as a binary probit model. However, where a dependent categorical variable has more than two cases, multinomial logistic regression as a general extension of the binomial choice is the most appropriate approach to use (Akinci, Kaynak, Atligan and Aksoy 2007). The multinomial logit model can be considered as 'simultaneous estimation of binary logistic regressions for all possible comparisons among the outcome categories' (Allaway, Gooner, Bekowitz and Davis 2006, p. 1331). As a tool of analysis, a logit regression model allows the researcher to predict a discrete outcome such as group membership from a set of variables for each case, to determine the percent of variance in the dependent variable explained by the independent variables; and to rank the relative importance of independents as in a rank ordered logit model (Tabnachnick and Fidell 2007).

3.6.10 Application of a MLR Model

Logistic regression (multinominal logit in particular) has been used extensively for categorical dependent variables in the marketing literature for modeling consumer choice (McFadden 1974). Logistic regression applications for marketing have emerged in the areas of consumer based studies encompassing the decision making process and business based studies dealing with a broad range of marketing topics (Akini et al. 2007). In a

typical application, as a multivariate analysis, MLR is a very useful analysis technique for the modeling and discrimination problems in marketing, since it has alternative distribution assumptions; it generates more appropriate and correct findings in terms of model fit and the correctness of analysis (Fornell and Bookstein 1982).

Allawy, Gooner Berkowitz and Davis (2006) investigated the potential relevant customer segments within a retail loyalty-type program initially using a cluster analysis. A multinomial logit model was subsequently used to test more rigorously and examine how other measures as geographical location relating to retail patronage explained group membership. Similarly, Leishman and Watkins (2004) used MLR in conjunction with cluster analysis to further examine the behavioural agenda and decision making of office occupiers. A logistic regression model facilitated the assessment of the relative importance of a range of factors in determining the choice of office space to be occupied.

In an educational context, a number of discrete choice models (logit, nested logit, and probit) have been used to develop models of behavioral choice or of event classification. Logit models enable researchers to estimate the probability that a prospective student will apply to certain tertiary institutions, and choose to attend one of them. A respondent's demand for a particular type of program, and tertiary institution, could then be obtained from these probabilities. There are many potential applications of discrete choice models. Four such models are discussed in the next section.

In a recent study, Drewes and Michael (2006) applied a rank ordered logit model to explore how students make choices between universities as a complete ranking of all presented alternatives was obtained from respondents. The study found the attributes of distance and scholarship spending and higher levels of non-academic student services preferences shaped applicant's choices between tertiary institutions. Worthington and Higgs (2004) used a bivariate probit model to predict the choice of an Economic major on two groups of Australian first year undergraduate Business student, those who did not nominate an Economics major and those who did as part of their program. The role of student personality and perceptions of the profession indicated as being primary influences on the selection of a major in economics. Montgomery (2000) proposed a two school-choice decision model to examine the factors influencing selection of a graduate business program. Appropriated suited to this proposed decision model, a nested logit model

facilitated the 'joint decision making' of applicants of whether (and how) to attend school (part-time or full-time), and which school to attend. Long (2004) investigated match-specific information between individuals and colleges on alternatives available to prospective students spanning a twenty year period. To test the college choice framework, a conditional logistic choice model was proposed, the author arguing such a model being 'well suited' in dealing with an extensive volume of data and allowing for multiple alternatives. Overall, price was found to be an important factor when individuals choose between colleges, particularly among low-income students.

In this thesis, the dependent variable of choice behaviour is a non-metric variable whereby there are three discrete outcomes of current enrolment in a particular portfolio. Therefore, predicating and estimating the effects of a set of variables hypothesised to drive group membership is appropriately suited to multinomial logistic regression (Hausman and McFaddin 1984). The multinomial logit model is the most commonly applied model to explain and forecast discrete choices due to its ease of estimation and foundation in utility theory. MLR was undertaken with the objective of gaining an understanding of the variability in selection behaviour that may exist among the three portfolios and examine the role of psychological constructs of personal values and motivation and selection criteria on choice behaviour. In addition, the third set of hypotheses proposing the likelihood of psychological constructs being positively associated with student's particular preference selection set were tested using the discrete student choice model. The set of variables incorporated in the structural model were also used to develop this model, however the discrete student choice model also incorporated socioeconomic and demographics variables.

3.7 Measurement Instrument

This section provides definitions and the theoretical background to the psychological constructs hypothesised to drive the preference behaviour of prospective undergraduate students. Four sets of variables function as independent variables. They are personal values, motivation, selection criteria and demographic and socioeconomic factors. The dependent variable is the preferential choice undergraduate students make in selecting a particular degree program and discipline.

The questionnaire was designed to guide the respondent through the proposed conceptual model of choice behaviour, initially commencing with questions exploring the sequence of their preferences emanating from the pre-search stage, that of 'degree program-discipline–university'. The questionnaire then flowed to investigating three psychological constructs of personal values, motivation and selection criteria in terms of importance. The last section requested information in order to compile a respondent's profile on the basis of demographic and socioeconomic variables.

Proceeding from the development of measurement scales, a pilot study was carried out to test and enhance the proposed questionnaire's face validity. In other words, to determine whether the scale items were representative of the attributes measured. A pre-test was conducted on a convenience sample of eighteen second year Business students with the objective of validating items wording, ease of filling out the questionnaire, ordering of the questionnaire and the applicability of the questions. Feedback and comments from the respondents resulted in changes to Q.6 from an open ended response to a ranking scale, and four statements in the PVIS scale were slightly reworded to increase clarity and readability.

3.7.1 Scale Development

Exploratory research with the aim of attaining qualitative data guided the development of three measurement scales pertaining to each construct of personal values, motivation and selection criteria questionnaire. The development of the measurement scales was directed by a two phase approach. The first phase entailed an exploratory approach to facilitate item generation for scale development. For the constructs of motivation and selection criteria, item generation occurred through exploratory research with secondary data. However, as is the case in most LOV research over the past five years, parenthetical definitions were applied to each of the values on the survey instrument (Kropp et al. 2005). That is, statements developed to better define the construct measured. Desiderato et al. (2002) chose to develop their own measure of educational values specific to the cohort of students that represented their sample frame.

Accordingly, to capture the respondent's personal values in an educational context, value statement specific for this purpose had to be designed. As such, a qualitative questionnaire was used to identify preliminary insights and understanding of parenthetical definitions for the Personal Values Importance Scale (PVIS). The second phase entailed pre-testing the

developed measurement instrument to draw attention to, if any significant issues (refer to Section 3.6). On completion of the second phase of scale development, a questionnaire survey facilitated among other things, gathering substantial amount of metric type data from the target population lending to selecting inferential multivariate techniques as tools of analysis.

In developing, assessing and implementing a multi-item scale measure, a number of guidelines and procedures are recommended to ensure the measures are 'as psychometrically sound as possible' (Bearden and Netemeyer 1999, p.3). Churchill (1979) offers a framework for development of measures to establish the reliability and validity of marketing constructs. The suggested sequence has been adopted by researchers in the field of services quality measurement (Parasuraman, Zeithaml and Berry 1988) although not without criticism (Smith 1999).

The evaluation of measures included: *first,* specifying the domain of construct and *second*, generating samples of items for the constructs of personal values, motivation and selection criteria. However, two additional evaluation measurements of collecting data and purifying the measure were undertaken only for the construct of personal values as constructing a measurement scale involved undertaking primary data via a qualitative survey. Therefore to ensure validity and reliability of the proposed personal values influence scale (PVIS) the latter measure entailed assessing validity via content validity. Applications of this measure were not considered relevant for the construct of motivation and selection criteria due to the availability of pre-existing validated scale items.

3.8 Personal Values Important Scale (PVIS)

3.8.1 Domain of the Construct

It is when making a selection that personal values become highly relevant in significant evaluation of choices. Values provide potentially powerful explanations of human behaviour because they serve to guide actions, attitudes, judgments as standards of conduct and comparisons across specific objects and situations; tend to be limited in number, universal across cultures and temporarily stable (Daghfous et al. 1999; Long and Schiffman 2000). An individual's value system Rokeach (1973, p.11-13) argued 'works as a general plan for resolving conflict and making decisions'. Furthermore, Kahle and Kennedy (1989, p.11) explicate 'most marketing efforts will be considered more effective if the role of

values is considered' and that, 'without considering the function of values in a certain context, one may be missing an important influence on behaviour'.

Several operational approaches have been developed to measure values. Rokeach (1973) constructed the Rokeach value system (RVS) which measures 18 instrumental values (beliefs about desired modes of action, such as being independent or ambitious) and 18 terminal values (beliefs about desired end states as freedom, comfortable life) (Allen, Ng and Wilson 2002). The distinction between preferable modes of behaviour and preferable end-states of existence implies a differentiation between means and ends or what Rokeach calls 'instrumental' and 'terminal" values' (refer to Table 3.3). Instrumental values relate to modes of conduct and include such characteristics as ambition, independence, and responsibility. Terminal values describe the individual's desired end-state of existence and include such conditions as leading an exciting life, family security, and salvation (Vinson, Munson and Sakanishi 1977, p. 274).

Table 3.3: Rokeach (1973) Terminal and Instrumental Values

Terminal Values	Instrumental Values
A comfortable life	Ambitious
An exciting life	Broadminded
A world of peace	Capable
A world of beauty	Cheerful
Equality	Clean
Family security	Courageous
Happiness	Forgiving
Inner harmony	Helpful
Mature love	Honest
National security	Imaginative
Pleasure	Independent
Salvation	Intellectual
Self-respect	Logical
Social recognition	Loving
True friendship	Obedient
Wisdom	Polite
	Responsible
	Self-controlled

The purpose of the marketing application of RVS has also evolved over time to have important implications for marketing and consumer behaviour research (Vinson et al. 1977). RVS was typically applied to describing a structure of population, whereas its use as a criterion for segmenting populations into homogeneous groups sharing common values has typified more recent application of RVS (Kamakura and Mazzon 1991).

Respondents are asked to rank each list of 18 values in order of importance as guiding principles in their lives. Ranking was a preferred method of choice as fundamentally Rokeach (1973) espoused values are part of an organised system that is prioritised with respect to other values, thus ranking reflected this inherently comparative nature of values (Kamakura and Mazzon 1991). However, in its original format RVS exhibited a number of major limitations (Wang and Rao 1995; Beatty, Homer and Kahle 1988; Vinson et al. 1977; Guttnan and Vinson 1979). These included: subjects are forced to rank one value at the expense of another which may actually be equally important to them; the presentation of the 36 value items may exceed the respondent's ability to accurately process information and thus distort the ranking procedure; the ranking nature of the data precludes the use of a wide variety of useful statistical analysis techniques that might otherwise be used (Rankin and Grube 1980). Another disadvantage of ranking is its 'ipsative' quality, that is if some values are ranked high, then other values must be ranked low (Feather 1973).

In measuring values, it is a combination or a list of values that is considered more effective rather than a single value (Kahle and Kennedy 1989, Kamakura and Novak 1992). The underlying premise driving this assumption is that values exist as 'structural hierarchies logically and meaningfully tied together' (Pitts and Woodside 1983, p. 38). The personal values used in the questionnaire to test causal hypotheses derive from the *List of Values (LOV)* (Kahle 1983). As an inventory LOV is a set of specific values established a priori to explain an individual's behaviour toward a particular construct (Lages and Fernandez 2005). Emanating from a theoretical base of Feathers (1975), Maslow (1954) and Rokeach (1973), LOV works on values in order to assess adaptation to various roles through value fulfilment. Instead of ranking the values, respondents are required to assess the importance of each value item on a scale. A rating scale approach imposes fewer constraints on the data. Since the goal of the value survey is to identify people's underlying value dimensions, the rating approach would seem to be preferred.

Importantly, the use of an interval rating provides insight in to the intensity with which an individual allocates to and upholds a particular value. With this modification, in comparison to the RVS, the survey is brief, easy to administer and requires minimal time to complete. Finally, LOV can employ higher level (interval) statistics (Homer and Kahle 1988). However Likert-type scales may suffer a tendency of 'social desirability effects' whereby respondents choose one end of the scale or similar scores for all nine values (Wang and Rao 1995; Beatty et al. 1985; Shoham et al. 1988). This may complicate the analysis of value preferences by producing spurious positive correlations (Alwin and Krosnick 2001).

A number of past studies have administered the LOV scale as a measurement tool. Kim et al. (2002) adopted LOV as a measurement of values investigating the relationship of consumer values, needs and purchase behaviour in two Asian consumer markets. Their study outcomes affirmed past research that the LOV is an effective way to measure values resulting from lifestyle, consumption activities, and product preferences. Kamakura and Novak (1992) state the LOV provides one solution to the difficulty of ranking 18 values (RVS) and hence considerably simplifies the ranking task. Shim and Eastlick (1998, p.69) supported the LOV application in determining the influence of personal values on mall shopping attitude and behaviour, advocating its 'simplicity of administration and high reliability'. Similarly Jayawardhena (2004) utilised values from LOV to investigate the role of personal values as an influence on e-shopping behaviour. The importance of using a well-established values scale becomes paramount when assessing scale reliability and validity. Evidence of the LOV scale meeting both requirements has been cited extensively in past research (Kahle et al. 1996; Kropp et al. 2005).

3.8.2 Generate a Sample of Items

Sample item generation involved administrating a qualitative survey to explore the perceived meaning of the underlying nine LOV constructs in an educational context. The objective driving this procedure was to generate statements and/or definitions to capture specified value domains of the nine LOV values.

A qualitative questionnaire identified preliminary insights and understanding of definitions through open ended and semi structured questions distributed to undergraduate Business

students. An example of the questions asked is indicated in Table 3.4. A complete inventory of answers is listed in the Appendix.

Table 3.4 Question 1: Exploratory Survey

Please complete the grid below as to what each values means to you. *There is no right or wrong answer.*
To me…(*self fulfilment*) means: Other words for … (*self fulfilment*): A person who acquires….(*self fulfilment*) is:

As stated the two additional evaluation measurements of collecting data and purifying the measure undertaken only for the construct of personal values (PVIS) are discussed below. To ensure validity and reliability of the primary data collected for the proposed personal values influence scale (PVIS) the latter measure entailed assessing validity via content validity.

3.8.3 Collecting Data

Forty-five undergraduate Business students in their second and third year majoring in Marketing participated in the survey. The item development phase generated just over 900 responses to the three questions pertaining to the nine LOV values on the survey. Some of the responses included for example;

For the value of:

(a) self- fulfilment: translated to; '*I feel happy with what I have*' and '*believing in myself*'

(e) sense of belonging translated to; '*feeling comfortable*' and '*at ease with my family and friends*' and '*acceptance and inclusion in my environment'*.

3.8.4 Purify the Measure

:Specifying the domain of the construct, generating items that exhaust the domain and subsequently purifying the resulting scale should produce a measure is content or face valid and reliable (Churchill 1979 p. 70).

Assess Validity – Content Validity

Measuring content validity entails assessing the extent to which the questions posed on the questionnaire are representative of the attribute measured**.** To test for 'content' and 'face' validity of the scale items, a panel of four marketing academics with both knowledge and expertise were asked to match parenthetical statements and/or definitions to the nine value constructs. Underlying this approach was the objective of refining the pool of responses to statements representative of the constructs avoiding jargon, or difficult words, and ambiguous words (refer to Table 3.5) (Bearden and Netemeyer 1999). The value statements were an outcome of consolidating a number of responses displaying similar underlying responses into category descriptors (refer to Appendix A3).

Table 3.5: The Scale of Personal Values – (PVIS) Parenthetical statements

a. Self- Fulfilment
1.I feel happy with what I have
2.Being well balanced , content and at one with the world is important to me
3. One should work hard always to achieve life goals that lead to self fulfilment
4. Gaining personal satisfaction through succeeding is important to me
5. Believing in myself is an important attribute to me
b. Self- Respect
1.It is important to have a sense of dignity about myself
2.Not compromising myself is a valued attribute
3. It is important to stand up to what I believe in
4. I always maintain a set of actions that reflect positively on who I am
5. Being worthy, confident and proud are beliefs that are important to me
c. Sense of Accomplishment
1.Achieving a personal goal is important to me
2.I always try to complete successfully what I set out to do
3.I take pride in my efforts to complete a task
4. I gain internal satisfaction for doing something right
5 Finishing something makes me feel content and satisfied

d. Security

1.I always have faith that nothing will go wrong
2.To be protected by someone or something is important to me
3.To feel safe, protected and secure is important in my life
4. It is important to me to be mentally and emotionally stable
5. I always seek to feel comfortable in any situation

e. Sense of Belonging

1. Feeling comfortable and "at ease" with my family and friends is important to me.
2. Accepted and included in my environment is important to me
3. It is very important to me to fit in with a group of similar people
4. I always seek to be part of a community
5. Being welcomed and accepted for who I am gives me a deep sense of belonging.

f. Warm Relationships with others

1.Being socially connected with others is important to me
2.I always seek interactions and connections that are mutually satisfying with others
3.It is very important to me to form bonds and ties with people
4.Building friendships, associations and networks is important to me
5.Contributing and learning from relationships is important to me

g. Being Well Respected

1.It is important to be admired others
2. It is very important to me to have a good reputation
3. Other people's opinion and regard of me is important
4. Being seen as a role model and looked upon by others is important to me
5. People who have expertise in some areas are well respected

h. Fun and Enjoyment in life

1.Getting the most out of life is important to me
2.Doing things for myself which make me happy is important to me
3. It is important to me to be happy and know how to have a good time
4. Doing something I want to do is important to me
5. I always seek to have a great time in whatever I choose to do

i. Excitement

1.I always enjoy the thrill and risk of breathtaking activities
2.It is important to me to look forward to something
3.I always seek new experiences and possibilities
4.I always enjoy the anticipation of something new
5.I like to go to places that involve exciting activities

3.8.5 Dimensions of the LOV scale

In testing the 'value-attitude behaviour hierarchy', Homer and Kahle (1988) reduced the nine LOV values into three latent constructs and hypothesised a 3 factor model (refer to Table 3. 6).

Table 3.6: Three Latent Constructs of LOV

Dimensions		
Internal Values	**External**	**Interpersonal**
(a) Self fulfilment	(d) Sense of Security	(h) Fun and enjoyment in life
(b) Self respect	(e) Sense of belonging	(i) Excitement
(c) Sense of accomplishment	(f) Being well respected	
	(g) Warm relationships with others	

Therefore on the basis of this outcome and confirmation by further research (Kropp et al. 2005; Chryssohoidis and Krystallis 2005; Jayawardhena 2004; Daghfous et al. 1999) this thesis specified and adopted a priori that values have the three underlying dimension of internal, external and interpersonal.

3.9 Motivation

3.9.1 Domain of the Construct

Motivation can be regarded as the necessary drive towards achievement of some goals (Analouli 2000). Students in their quest to pursue tertiary studies become motivated to enrol in academic institutions of their choice. As a construct, motivation is one of the most important psychological concepts in education (Vallerand et al. 1992, p.1004). In general the literature on 'student motivation' in particular distinguishes broadly between intrinsic (an interest in study for its own sake) and extrinsic (an interest in study because of later outcomes) motivations, with intrinsic motivation generally having a greater effect on longer term outcomes (Long et al. 2006).

A number of studies conducted to investigate student motivation (Long et al. 2006; Byrne and Flood 2005; Krause et al. 2005; Bennet 2004; Bogler and Somech 2002; Fazey and Fazey 2001) for deciding to participate in higher education have found primarily students exhibit a mixture of behaviour that is intrinsically and extrinsically motivated. However, an alternative taxonomy in classifying motives has also been proposed. Boger and Somech (2002) classified motives on the basis of subcultures to investigate the motives of

undergraduate students. The three classified motives were referred to as 'instrumental', 'scholastic', and 'social' or college. Dinwoodie (2001) proposed 'employment' and 'academic' motivation to understand what attracts students in to Master's study.

3.9.2 Generate a Sample of Items

Exploratory research in this case entailed 'literature searches' indicating how variables have been previously defined and used (Churchill 1979). The basis of the seventeen statements listed on the Motivation Influence Scale (MIS) (refer to Table 3.7) are derived from the *Academic Motivation Scale* (AMS) (Vallerand et al. 1992) which measures perceived intrinsic, extrinsic and amotivation reasons motivating potential students to proceed to higher education (Long et al. 2006, Fazey and Fazey 2001). The statements on the questionnaire designed for this thesis were broadly categorised as either 'intrinsic', 'extrinsic', or 'amotivation' reasons. Fazey and Fazey (2001) applied the *Academic Motivation Scale* to measure student's motivation for study in higher education, while Long et al. (2006) primary focus was exploring the reasons for attrition and matching students' own reasons for enrolling in their course. For both studies, students responded to statements measured on a 7-point Likert-like scale.

Table 3.7: The Scale of Motivational Influence – (MIS)

a. A degree will enable me to get a prestigious job – *Extrinsic*
b. I want to become a better educated person - *Intrinsic*
c. The chance to meet and make new friends - *Amotivation*
d. All my friends are going to university – *Amotivation*
e. I want to experience life as a university student - *Intrinsic*
f. I will enjoy the academic challenge of a degree course - *Intrinsic*
g. Gaining a degree will allow me to earn more money - *Extrinsic*
h. My parents want me to go to university - *Amotivation*
i. To show I can be successful at university - *Extrinsic*
j. I need a degree to follow my chosen career - *Extrinsic*

k. A university degree is really important for me. - *Extrinsic*
l. I don't want to get a job yet - *Amotivation*
m. Getting a degree will allow me to get the job I want - *Extrinsic*
n. Attending the right institution expresses who I am - *Extrinsic*
o. Choosing the right institution will get me a head start in life - *Extrinsic*
p. You can tell about a person from the institution they attend - *Extrinsic*
q. I get a lot of enjoyment out of learning new things - *Intrinsic*

According to Vallerand et al. (1992), intrinsic motivation (IM) refers to engaging in an activity for itself and the pleasure and satisfaction attained from participation. Extrinsically motivated (EM) behaviour pertains to such behaviours 'which are engaged in as a means to an end, and not for their own sake' (p. 1006). Vallerand et al. (1992) identifies a third type of motivational construct is referred to as amotivation. This refers to individuals who are neither intrinsically or extrinsically motivated, rather such individuals perceive their behaviours are caused by forces out of their control and become amotivated when they do not perceive contingencies between outcomes and their own actions. Accordingly intrinsic and extrinsic motivation is conceived as global constructs positioned at opposing ends of an internal- eternal continuum (Fazey and Fazey 2001).

Table 3.8: Vallerand et al. (1992) Academic Motivation Scale

Intrinsic Motivation:
a. to know
b. to accomplishment
c. experience stimulation
Extrinsic Motivation :
d. external regulation
e. introjected regulation
f. identification
Amotivation

Some of the motivational reasons applied in the MIS scale emanated from research undertaken by Whitehead et al. (2006). The study sought to identify factors that encouraged or discouraged A level students from applying to a specific university, in this case Cambridge. A five point Likert type scale measuring the level of importance yielded a factor analysis outcome of three factors (refer to Table 3.9).

Table 3.9: Whitehead et al. (2006)

Factor 1: (Amotivation)
My parents encouraged me to go to into HE
**My parents want me to go to into HE*
Its what most of my friends are doing
I couldn't think of anything else to do
**I don't want to get a job yet*
It seems a natural progression from school
Factor 2: (Intrinsic)
**I want to experience life as a student*
I want to enjoy the student social life 'I want to move away form home and be independent
**I think I will enjoy the academic challenge of a degree course*
Factor 3: (Extrinsic)
I want to train for a particular career
**I need a degree to follow my chosen career*
I want the opportunity to study a new subject
I want to train for a particular career
* Statements applied in Motivation Importance Scale (MIS)

The study implicated prospective students identify with three different clusters of reasons once deciding to apply to higher education. These reasons are listed below. The study also found a combination of motivation and complex interaction between a numbers of key variables influenced students to apply to differing degrees.

1. Anticipating enjoying student life (collegian) and challenge of academic study

2. Going into HE to train for a particular career

3. Responding to encouragement to go into HE in the absence of any clear alternative

In summary, the influence of each motivation for this thesis was measured on a seven point Likert-type scale (1='*not important at all* 'and '7' = *extremely important*). More specifically the influence of motivation from Table 3.5 are categorised as follows:

1. The influence of extrinsic motives is measured by items; (a), (g), (i) (j), (k), (m), (n) (o), (p).

2. The influence of intrinsic motives is measured by items; (b), (e), (f). (q)

3. The influence of amotivation is measured by items; (c), (d), (h, (l)

3.10. Selection Criteria

3.10.1 Domain of the Construct

As with the MIS scale, exploratory research in this case entailed 'literature searches' (Churchill 1979) indicating how variables have been previously defined and used. Prior research has identified a number of factors and/or attributes influencing choice behaviour of the undergraduate students' search process in the choice of programs, disciplines and educational institutions.

3.10.2 Generate a Sample of Items

Originating from a theoretical and empirical foundation (Veloutsou et al. 2004, Gray et al. 2003; Soutar and Turner 2002, Joseph and Joseph 2000) four underlying dimensions were proposed to exist among the fourteen attributes as underlying factors. The dimensions are reputation influences, academic influences, entry influences and external influences.

A fourteen attribute scale of Selection Criteria Influence (SCI) (Table 3.10) was constructed to measure the importance of each attribute deemed the most relevant to first year undergraduate students' selection criteria.

Table 3.10: The Scale of Selection Criteria Influence (SCI)

a.	University Reputation
b.	Course Suitability
c.	Entry requirements
d.	Range of Courses available
e.	Cost of Fees
f.	Type of University
g.	Family Opinion
h.	Location of University
i.	University's resources (library, computer labs, and/or classrooms)
j.	Recreation and other facilities available
k.	Job Opportunities after Graduation
l.	Teaching staff experience and qualifications
m.	Program Reputation
n.	Prestige and status of the University

Six of the fourteen attributes; *academic reputation of the university*, *course suitability, type of university, teaching qualifications, job prospects/opportunities,* and *family opinion* were adopted from findings by Soutar and Turner (2002). The authors investigated the relative importance school leavers' attach to a list of attributes when choosing to enter a tertiary institution. The population of interest comprised Western Australian school leavers from both government and non-government schools. The study employed a conjoint analysis approach to achieve its aim of understanding how students traded off between various preference factors. The research initially included ten attributes; including personal factors (Table 3.11). However, the study concluded with identifying four most important determinants preference for Western Australian school leavers, that of 'course suitability', 'academic reputation', 'job prospects' and 'teaching quality'. These four attributes were rated in terms of relative importance.

Table 3.11: Ten Attributes - Soutar and Turner (2002)

*1. *Course Suitability*
*2. *Academic reputation of the institution*
3. Job prospects
4. Campus atmosphere
*5. *Quality of the teaching staff*
*6. *Type of university*
7. Distance from home
8. **Family Opinion*: what their family thinks about each university
9. Friends
10. Ability to Transfer
* Attributes applied in the Selection Criteria Importance Scale (SCIS)

Similar to Soutar and Turner (2002), Veloutsou et al. (2004) identified the 'academic' aspects of the university (as reputation and course suitability) as the primary decision criteria for students. Veloutsou et al. (2004) examined the information requirements and the importance of various types of information for 306 potential students when selecting a university. High school leavers from Scotland, Northern Ireland and England were asked the information they required when evaluating various university courses and the importance of the various types of information for the selection of a specific course and specific university. The data named nine factors describing specific information requirements which revealed similarity between the ranking and allocated importance of the information (refer to Table 3.12). Furthermore, the most important information potential students seek students when choosing a university, is related to 'university reputation' and 'courses and campus'. Other important information collected pertains to 'the content of the course, the department's reputation' the course as a 'learning experience' and the 'university' reputation'. Chapman (1986) concurs stating when applicants choose to apply to a university the importance of the perceived overall academic quality is unquestionable and the most important attributes when assessing this are the quality of faculty and the degree programmes offered.

Table 3.12: Selection Criteria - Veloutsou et al. (2004)

1.	Local infrastructure
2.	**Local social life*
3.	Career prospects
4.	**University's infrastructure*
5.	University's social life
6.	Business contacts
7.	University's reputation
8.	Campus
9.	Local social life
* Attributes applied in the Selection Criteria Importance Scale (SCIS)	

Veloutsou et al. (2004) 'university's infrastructure and social life' criteria translated to *university resources* and *recreation and other facilities* as selection attributes. The institutions' infrastructure included facilities such as the library, classrooms, computer labs, campus security and accommodation provided by the university.

Two of the fourteen attributes: *course entry requirements* and *location* tie in as preferential criteria for international students in their decision to study at a particular tertiary institution (Joseph and Joseph 2000). These attributes were considered as part of the criteria set as international students will assume to be part of the population of interest. However, both attributes are suitably relevant to local students, whereby *location* pertains to a university site and the geographical surroundings and *course entry* to the entry requirement for a particular degree program. James et al. (1999) suggested course entry scores, and by implication 'university scores', served as a proxy for quality and a sign of prestige in prospective students' eyes.

The last two criteria relating to issues of reputation and prestige of the program and the university emanated from a study conducted by Joseph and Joseph (1988) examining variables that influence Business students' selection criteria of tertiary institutions. The criteria deemed most important included: program related issues as 'flexibility and length of the program' and 'reputation and prestige issues'. In summary, the influence of each selection criterion for this thesis was measured on a seven point Likert-type scale (1='not

important at all ’and ‘7’ = *extremely important*). More specifically the influences of motivation from Table 3.8 are categorised as follows:

1. The influence of reputation is measured by items; (a), (b), (m) (n),

2. The influence of academic resources is measured by items; (e), (i), (j) (l)

3. The influence of entry is measured by items; (c), (d),(f), (h)

4. The influence of external is measured by items; (g), (k)

3.11 Demographic and Socio Economic Factor

Both values and demographics have been beneficial in predicting consumption behaviours (Kahle et al. 1996), making them useful for segmentation purposes (McCarty and Shum 1993) and for developing marketing strategies. Rokeach (1973) suggested values have a direct relationship with demographics such as culture, income and education. Shoham et al. (1988) are in accord with Rokeach asserting the importance of examining both values and demographics simultaneously as both constructs are useful for segmentation purposes. In fact, McCarty and Shrum (1993, p.78) noted academic researchers tend to ‘be reluctant to consider demographic variables in the explanations of behaviour’; asserting the inclusion of demographic factors (gender, age, income and education) is important in understanding the true nature of the values-behaviour relationship. Carman (1977) in his development of a comprehensive extended model of consumer decision making integrates demographic and socio economic factors and personality.

Demographic variables based on a respondent’s age, gender, country of birth, entry level and student type provided a descriptive profile of student cohorts. Socioeconomic status is a broad concept which comprises three main dimensions: occupation, education and wealth. Parental occupational status is defined by the occupation of the parents with the highest occupational status. Similarly, parental educational level is defined by the education of the parent with the highest educational level; and combined household income was measured as an indication of the influence of socioeconomic status upon student preferences. For this thesis, both parents were considered for all of the three measures.

Based on a number of recommendations originating from a report commissioned by the University of Queensland [3] (Western et al. 1998), each socioeconomic factor was treated a single dimension rather than collapsed into a single socioeconomic indicator and measured with fixed choice questions. One of the major problems associated with questions on socioeconomic factors as parental education, occupation and income is that they attract a large amount of missing data. Jones (2001) offers some insight in that students sometimes simply do not know their parents' education and/or are intimidated by the range of possibilities. However for missing data, it is possible to report on mean scores and use this information to impute other scores for a particular group (Hair et al. 1998).

There are a number of different approaches employed towards the scaling of occupations to reflect a low to a high economic status (Marks et al. 2000). As a single socioeconomic index was not applied in this thesis, the most appropriate measure of socioeconomic position emanated and was adapted from the National Statistics Socio-Economic Classification (NS-SEC) (Rose and O'Reily 1998). Based on occupational prestige, the NS-SEC consists of 13 class groupings which could be further collapsed into classifications. Class grouping are made broadly on the distinction between employers who buy labour; employees who sell labour; and the self employed who do neither (Marks et al. 2000). The nine occupational classes used in the questionnaire were collapsed to reflect the'[4]Three Class' NS-SEC classification. However disproportional distributions of occupations (refer to chapter 4) resulted into dividing category three 'working' category into two further categories; labelled 'self employed' and 'working' respectively, resulting into a 'four class' classification of occupations.

Proceeding from the development of measurement scales, a pilot study was carried out to test and enhance the proposed questionnaire's face validity. In other words, to determine whether the scale items were representative of the attributes measured. A pre-test was conducted on a convenience sample of eighteen second year Business students with the objective of validating items wording, ease of filling out the questionnaire, ordering of the questionnaire and the applicability of the questions. Feedback and comments from the respondents resulted in changes to Q.6 from an open ended response to a ranking scale, and four statements in the PVIS scale were slightly reworded to increase clarity and readability.

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[3] *Differential Access to Higher Education: The Measurement of Socioeconomic Status, Rurality and Isolation,* Evaluation and Investigations Programme Higher Education Division

[4] 1. Managerial & Professional; 2.Intermediate, and; 3. Working

3.12 Summary

In terms of selecting a relevant research design, exploratory research was initially conducted followed by a causal approach to test the proposed hypotheses central to the notion that four independent drivers influence a prospective undergraduate student's preference in selection of a particular program, discipline and university. The process of data analysis employing descriptive statistics, non-parametric techniques and testing for the psychometric properties of proposed measurement scales is discussed in Chapter four. Structural equation modeling and multinomial logistic regression to analyse the results is detailed in the chapters five and six respectively. Chapter seven discusses the empirical findings and academic and marketing implications are discussed.

Chapter 4

DESCRIPTIVE STATISTICS

4.1 Introduction

This chapter presents the results of the descriptive analysis. The aim of this section is to assess how representative the sample is with respect to preferences of particular programs, disciplines and university and to provide an understanding of the sample through examining distributions of the behavioural and demographic variables. Descriptive analysis also facilitated hypothesis testing through the use of non-parametric techniques such as chi square test for relatedness and the Mann-Whitney U test (Wilcox ranks sum W test) for the second set of hypotheses proposed. Furthermore a description of the characteristics of the sample entailed an exploratory discussion of similarities and differences of posited relationships. A 'snapshot' summary will be provided after each section. This chapter is organised around four major topics.

1. Topic one will profile the respondents in terms of both demographic and socioeconomic factors.

2. Topic two will profile respondents in terms of their behavioural preferences when selecting a particular programs, disciplines and university.

3. Topic three will profile respondents in terms of the importance allocated to the original items of the three psychological constructs of personal values, motivation and selection criteria.

4. Topic Four will examine and test the psychometric properties of the three scales and establish the domain of the theoretical constructs and their indicators through exploratory factor analysis (EFA).

4.2: Topic 1: Profile of the Survey Responders

First year undergraduate students studying in their first semester at RMIT University across the three academic portfolios of Business, Design and Social Context (DSC) and Science, Engineering and Technology (SET) constituted the population of interest for this thesis. Approximately 450 self administered surveys were distributed across the three portfolios with the final sample size equating to 304 respondents indicating a 67% response rate. Of the 304 responses, 42% were from the Business portfolio, 28.5% from DSC and the remaining 29% from SET. The degree programs represented in thesis are outlined in Table 3.2 of Chapter 3.

4.2.1 Age and Entry Level

Table 4.1 depicts the distribution of the survey sample of 304 respondents with respect to age. Sixty percent of the respondents were Australian HECS paying students, with 17% of students paying HECS upfront, 7% of students classified themselves as 'full fee' paying and almost 15% reported as 'International full fee' paying students. Seventy five percent of all respondents classified themselves as 'school leavers', (refer to Table 4.2), with 76% of those students falling into the '17-20' age bracket with the remaining 20% of classified in the '21+' age bracket. Mature aged students represented 17% of the population. Business portfolio represented 45% of the '17-20' age bracket, followed by SET at 33% and DSC at 22%. In contrast, 53% of all students aged 21+ were enrolled in DSC. This was followed by a much lower proportion of the mature age students in the other portfolios with Business at 32% and SET at 15%.

Table 4.1: Respondents by Age

		Age				Total
		17-20	**21-24**	**24-27**	**27+**	
Portfolio	Business	110	9	6	3	128
	Design and Social Context	55	16	6	10	87
	Science, Engineering and Technology	80	3	2	4	89
Total		**245**	**28**	**14**	**17**	**304**
Percent		**80.0**	**9.0**	**5.0**	**6.0**	**100**

χ^2 (2 N =304) = 24.04 p =0.00)

In exploring the question; "*Is there a relationship between a student's age and preference choice of disciplines?"* a chi square test for relatedness showed a Pearson chi square of 24.044 with a probability of .000. The significance value is well below the alpha value of 0.05 and is therefore significant.

In addressing the hypothesis:

H2: Age is a factor in determining a student's particular preference selection set.

It can be concluded that there appears to be an influence of a student's age on the choice of preferred discipline.

Table 4.2: Respondents by Entry Level

		Entry Level				Total
		School Leaver	**Mature Age**	**Transfer**	**Other**	
Portfolio	Business	110	11	5	2	128
	Design and Social Context	46	33	5	3	87
	Science, Engineering and Technology	73	9	3	4	89
Total		**229**	**53**	**13**	**9**	**304**
Percent		**76.0**	**17.0**	**4.0**	**3.0**	**100**

4.2.2 Country of Birth

The majority of respondents (68%) were born in Australia; with China following at 8% as the second largest ethnic group (refer to Table 4.3). Other countries representing 18% included Malaysia, Fiji, Bosnia, Turkey, Wales and New Zealand. Forty eight percent of both parents across all portfolios were born overseas; this was followed by 35% of both parents born in Australia and the remaining 16% was accounted for by one parent born overseas. At a portfolio level, 56% of student enrolled in Business were Australian born with 21.0% of students born in Asia (China, Hong Kong, Indonesia and India). The portfolio of DSC indicated a majority of almost 84% of students were Australian born, while a little over 1.0% was born in Asia. Within the SET portfolio 68% of students are Australian born, and just over 6.0% were born in Asia. From 1994 to 2004, Krause et al. (2006) noted the significant rise in the proportion of students born in China and India as a constitution of international students studying in Australian universities.

Table 4.3: Respondents by Country of Birth

		COUNTRY			Total
		Australia	**Asia**	**Others**	
Portfolio	Business	72	27	29	128
	Design and Social Context	73	1	13	87
	Science, Engineering and Technology	61	6	22	89
Total		**206**	**34**	**64**	**304**
Percent		**68.0**	**11.0**	**21.0**	**100**

χ^2 (4, N =304) = 28.78 p<0.000)

In exploring the question; "*Is there a relationship between country of birth and preference choice of disciplines?"* a chi square test for relatedness showed a Pearson chi square of 28.78 with a probability of .000. The significance value is well below the alpha value of 0.05 and is therefore significant.

In addressing the hypothesis:

*H2a***:** Country of birth is a factor in determining a student's particular preference selection set,

It can be concluded that there appears to be an influence of country of birth on the choice of preferred discipline.

4.2.3 Gender

Table 4.4: Respondents by Gender

		GENDER		Total
		Female	**Male**	
Portfolio	Business	65	63	128
	Design and Social Context	56	31	87
	Science, Engineering and Technology	24	65	89
Total		**145**	**159**	**304**
Percent		**53.0**	**47.0**	**100**

χ^2 (2, N =304) = 25.5 p=0.00

Gender represented an almost equal distribution within the population, where 53% of the respondents were male and 47% female (refer to Table 4.4). Of those 53% male first year students, 22% expressed preference to enrol in SET, followed by 21% for Business and 10 % for DSC. Of those 47% female students, 21% expressed a preference to enrol in the Business portfolio, followed by 19% for DSC and almost 8% for SET.

Comparing male to female ratio within the Business portfolio (n= 128), there were 49% of male students compared with almost 51% of female students. DSC portfolio (n= 87) students showed a composition of 35 % of male students to 65% female students. In contrast, male students at 73% predominately represented SET (n= 89), to 27% of female students. Gender discrepancies were therefore most evident in the portfolios of DSC and SET. The SET outcome was consistent with the findings of a recent study US by Goyette and Mullen (2006) undertaken to explain both the influence of gender, race and socioeconomic status on selection of undergraduate fields of study. Gender research indicated men traditionally concentrated in fields such as Business, Engineering, Chemistry, and Physics while women have studied Education, Humanities, Nursing, and Psychology. In terms of choosing Engineering, the study found 13% of men compared to 2.4% of women enrolled in this discipline.

Student preference to enrol in Business of female to male students was almost on par respectively (22% to 21%). Pike (2006) investigated psychological and sociological aspects in understanding college expectations and results indicated gender was significantly related to student's expectations of intended majors.

In exploring the question "*Is there a relationship between gender and preference choice of disciplines?"* a chi square test for relatedness showed a Pearson chi square of 25.51 with a probability of .000. The significance value is well below the alpha value of .05 and is therefore significant. In addressing the hypothesis:

*H2b***:** Gender is a factor in determining a student's particular preference selection set

It can be concluded that there appears to be an influence of gender on the choice of preferred discipline. Results suggest female students predominately expressed preference to enrol in DSC and male students' preference for SET, while Business remained relatively on par. In sum, research on the selection of undergraduate fields of study reveals a strong association between gender and student's preferential choices.

4.2.4 Education Levels

Table 4.5: Parental Education Levels

		SES - PARENTS				Total
		Lower SES	**Medium SES**	**High SES**	**Don't Know**	
Portfolio	Business	111	34	96	15	256
	Design and Social Context	50	24	92	8	174
	Science, Engineering and Technology	64	32	65	17	178
Total		**225**	**90**	**253**	**40**	**608**
Percent		**37.0**	**15.0**	**42.0**	**6.0**	**100**

Across all portfolios, respondents reported 42% of parents completed a university degree and/ or a postgraduate qualification; this was followed by 37% of all parents completed at

least high school and 15% of all parents completed a diploma as their highest level of education. Almost 6% of respondents did not know their parents' level of education.

In terms of measuring socioeconomic background James et al. (1999) chose the highest parental education was chosen as an appropriate measure. Socioeconomic status (SES) subgroups were defined as follows:

1. *Lower SES:* parents attended primary school, and completed secondary school.

2. *Medium SES:* parents completed a vocational qualification, diploma or associate diploma (e.g. TAFE).

3. *Higher SES:* parents completed a university degree (and higher).

According to the above banding, the greatest majority of fathers (refer to Table 4.6) fell into the *Higher SES* band (47%), followed by the *Lower SES* band (33%) and the *Medium SES* band at 15%. For the mothers, (refer to Table 4.7) the greatest majority fell in to the *Lower* SES band (41%) followed by the *Higher* SES band (37%) and the *Medium* band at (15%). At a portfolio level, the results indicated the greatest majority of respondents' fathers across the three portfolios attained at least a university degree. The portfolio of DSC indicated a percentage of 55% attainment followed by Business at 44% and SET closely behind at 43%. Students enrolled in DSC reported almost 51% of their mothers as having completed a university degree and higher. This outcome was in contrast to both Business and SET that reported the majority of mothers as 'completing high school' as the highest level of education attained at 49% and 40% respectively. James et al. (1999 p.42) in their study of examining factors that influence tertiary applicants' selection of their preferred university suggested socioeconomic background did not seem to show a strong relationship to applicants' reasons for choosing a particular university, but 'there are some differences between the higher and lower socioeconomic groups'.

Dawes and Brown (2002, p. 55) undertook exploratory research to gain an insight as to what determines the awareness consideration and choice sets formed by students intending to embark on an undergraduate education. In testing their proposed model of brand choice; one of their explanatory individual–level variables included 'number of parents going to university'. Previous research from the US discussed by Dawes and Brown (2002) indicated the level of education of parents is likely to have an important impact on

student's university choice. Similarly, research by Reay (1998) suggested a student's choice processes were significantly affected by whether or not their parents (or other family members) had attended university.

Dawes and Brown's (2002) findings indicated students with university educated parents are likely to have larger consideration sets of acceptable brands (universities) from which to make a choice. Jimennez and Salas-Velasco (2000, p.307) in their report on *Modeling Educational Choices* concluded 'educational choices of students was a function of the educational success of their parents'. In addition, the report found if a respondent's mother attained a university degree as their highest level of education, this multiplied the probability the respondent will choose to study a long cycle degree. Checci (2000) found having both parents with at least a secondary school diploma raises the probability of a prospective student enrolling at a university.

To examine this outcome further, a chi square test for relatedness explored the question; "*Is there a relationship between SES background of fathers and mothers upon a student's decision to pursue a particular degree program?* The research question was expressed as two hypotheses, the first hypothesis proposed,

H2c: A father's particular educational level is a factor in determining a student's particular preference selection set.

Table 4.6: Educational Levels – Father

		SES Fathers				Total
		Lower SES	**Medium SES**	**High SES**	**Don't Know**	
Portfolio	Business	48	16	56	8	128
	Design and Social Context	25	11	48	3	87
	Science, Engineering and Technology	28	17	38	6	89
Total		**101**	**44**	**142**	**17**	**304**
Percent		**33.0**	**14.0**	**47.0**	**5.0**	**100**

χ^2 (6, N= 304) = 6.083 p= .414

The chi square statistic of 6.08, with a probability level of .414 (refer to Table 4.6) suggested the SES status of fathers is not a significant factor in influencing first year

undergraduate student's preference choice. The significance value was greater than the alpha value of .05 and is therefore not significant. In other words, the father's level of educational attainment cannot be considered as an influencing factor upon on the choice of preferred discipline.

The second hypothesis proposed:

H2d: A mother's particular educational level is a factor in determining a student's particular preference selection set.

The educational attainment of mothers showed a chi square of 16.04 with a probability level of 014. The significance value is below the alpha value of .05 and is therefore significant. It can therefore be concluded that there appears to be an influence of a mother's level of educational attainment on the choice of preferred discipline to undertake further undergraduate studies. In other words, the SES status of a respondent's mother appears to be an influencing factor upon potential undergraduate students in making their decision to pursue a particular discipline in the tertiary field. This outcome gives support to a traditional school of thought whereby in the case of parental education it is often considered that the mother's educational level is of primary importance (Marks et al. 2000).

Table 4.7: Educational Levels– Mother

		SES Mother				Total
		Lower SES	**Medium SES**	**High SES**	**Don't Know**	
Portfolio	Business	63	18	40	7	128
	Design and Social Context	25	13	44	5	87
	Science, Engineering and Technology	36	15	27	11	89
Total		**124**	**46**	**111**	**23**	**304**
Percent		**41.0**	**15.0**	**36.5**	**7.5**	**100**

χ^2 (6 N= 304) =1 6.04 p=.014

4.2.5 Occupation

Traditionally, it is the father's occupation that was considered as a measure for the occupation variable (Goldthorpe and Hope 1974) based on the rationale that it is the male adult who in the vast majority of households has the strongest attachment to the labour force (Marks et al. 2000). However, for this thesis, both parents occupational status were considered.

Table 4.8: Parental Occupation Levels

		Occupation - Parents					Total
		Professional	**Intermediate**	**Self employed**	**Working**	**Don't Know**	
Portfolio	Business	119	19	14	97	7	256
	Design and Social Context	104	13	8	43	6	174
	Science, Engineering and Technology	79	31	13	52	3	178
Total		**302**	**63**	**35**	**192**	**16**	**608**
Percent		**50.0**	**10.0**	**6.0**	**31.0**	**3.0**	**100**

Across the portfolios, missing data constituted 2.5% for all respondents reporting on their parent's occupation. Examining the distribution of parental occupations level across all the portfolios, the 'professional' category represented at almost 50% the largest occupational group. The 'working' category at 31.5% was the second largest group followed by the 'intermediate' group at 10% and the 'self employed' was the smallest representation of occupational categories at almost 6%.

A chi square test square test for relatedness was undertaken for both parental occupational levels to explore the question "*Is there a relationship between parental occupation and the decision to pursue a particular degree program?"* The research question was tested as two hypotheses.

In addressing the hypothesis *H2*e:

H2e: A father's occupational status is a factor in determining a student's particular preference selection set,

A chi square test of relatedness showed a chi square value of 17.72 probability level of .007 (refer to Table 4.9). With significance value well below the alpha value of .05, the outcome is therefore significant.

Table 4.9: Occupational Levels – Father

		Occupation - Father					Total
		Professional	**Intermediate**	**Self employed**	**Working**	**Don't Know**	
Portfolio	Business	70	8	8	39	3	128
	Design and Social Context	58	3	5	19	2	87
	Science, Engineering and Technology	47	17	6	18	1	89
Total		**175**	**28**	**19**	**76**	**6**	**304**
Percent		**57.0**	**9.0**	**6.0**	**25.0**	**2.0**	**100**
χ^2 (6 N=304) =17.72 p<.05 p= .007							

A father's occupation can be considered as an influencing factor upon an undergraduate choice of preferred discipline. The distribution of a father's occupation category at micro level across the portfolios suggested the category of 'professional' dominated, with the largest percentage was represented by the Business portfolio at 23%, followed by DSC at 19% and SET at 15%.

In addressing the second hypothesis,

H2f: A mother's occupational status is a factor in determining a student's particular preference selection set

The chi square statistic (refer to Table 4.10) of 11.25 with a probability value of .081 suggested the occupational status of mothers was not a significant factor in influencing first year undergraduate student's preference choice. The significance value was greater than the alpha value of .05 and is therefore not significant. It can be concluded that there does not appear to be an influence of the occupational status of the mother upon a student's choice of preferred discipline to undertake further undergraduate studies.

Table 4.10: Occupational Level – Mother

		Occupation - Mother					Total
		Professional	**Intermediate**	**Self employed**	**Working**	**Don't Know**	
Portfolio	Business	49	11	6	58	**4**	128
	Design and Social Context	46	10	3	24	**4**	87
	Science, Engineering and Technology	32	14	7	34	**2**	89
Total		**127**	**35**	**16**	**116**	**10**	**304**
Percent		**42.0**	**11.0**	**5.0**	**38.0**	**3.0**	**100**

χ^2 (6 N=304) =11.259 p= .081

Examining the distribution of the mother's occupations at micro level across all the portfolios, the dominant occupation for the Business portfolio was the 'working' category at 20%; for DSC the 'professional' category at 15% and for SET, similar to Business, the 'working' category at 11%.

4.2.6 Income

Table 4.11: Parental Combined Incomes

		Combined Income			Total
		$20 000 - $49 000	**$50 000 - $ 79 000**	**$80 000 - $90 000+**	
Portfolio	Business	43	34	49	128
	Design and Social Context	9	30	48	87
	Science, Engineering and Technology	22	37	30	89
Total		**79**	**94**	**131**	**304**
Percent		**26.0**	**31.0**	**43.0**	**100**

χ^2 (6 N=304) =20.657 p= .000

Table 4.11 indicates of all respondents, 43% reported their parents combined income falling in the $80,000- $90,000+ income bracket. However, almost 14% of responses to this question constituted missing data. The greatest percentage of missing data was from DSC (n= 87; 31%), followed by SET (n= 89; 10%) and Business (n=128; 4%). For this thesis, an imputation method (Hair et al. 1998) was employed for the missing data entries pertaining to the DSC portfolio. Missing values were calculated and replaced with mean substitution values considered the most appropriate replacement value of a missing variable

based on profile information available from the sample. Within the portfolios, 38% of students enrolled in Business reported their parents combined income falling in top income bracket of $80 000 - $90 000 plus. Similarly, DSC reported 50% of their parents' income belonging to the top income category. The portfolio of SET reported the majority (41%) of parental income fell into the middle income bracket of $50 000 - $79 000.

Goyette and Mullen (2006) reported 'earnings differentials' among different disciplines was also considered to play a strong role in a student's choice, particularly for male students. Jimennez and Salas-Velasco (2000) concur arguing an important association between family earnings and the type of studies followed. To examine this outcome further, a chi square test for relatedness explored the question "*Is there a relationship between parental combined income and student's decision to pursue a particular degree program"?*

In addressing the hypothesis,

H2g: Parental combined income levels are a factor in determining a student's particular preference selection set

A chi square test of relatedness showed a chi square of 20.65 with a probability level of .000 (refer to Table 4.11). With significance value well below the alpha value of .05, the outcome is therefore significant. The result suggested parental combined income is a significant factor in influencing first year undergraduate student's preference choice. In other words, parents' combined income can be considered as an influencing factor upon a potential undergraduate students' choice of preferred discipline to undertake further undergraduate studies.

4.2.7 Sibling Completion of Degree Programs and University

Almost 27% of students reported an older sibling completing a university degree. In terms of sibling completion, almost 11% of siblings completed a degree program in the same portfolio as the one in which the respondent is currently enrolled; contrasting with 15% of siblings completing degrees in different portfolios.

Within the portfolios, Business students reported 21% of sibling completion of a degree. Of that 21% completion rate, 12% of respondents enrolled in the same portfolio as their siblings. Considering RMIT as a university of preference to undertake tertiary studies, Business students indicated 5% of their siblings also had enrolled at RMIT University, with the remaining 15% choosing a different university to study. DSC indicated a 34% sibling completion of a university degree. Of that 34% completion rate, 11% of respondents enrolled in the same portfolio as their siblings. DSC students indicated only 2% of their siblings enrolled at RMIT with the remaining 32% preferred a different university to study. SET portfolio indicated 26% of respondents' siblings' completion of a degree program where 15% of respondents were not undertaking the same degree program as their siblings. SET students indicated as in the Business portfolio 5% of their siblings enrolled at RMIT with the remaining 19% preferring a different university to study.

4.2.8 Summary Snapshot Topic 1:

Profile Overview of Demographic and Socioeconomic factors of a 'First Year Undergraduate Student'

The typical first year undergraduate student at RMIT University is an Australian born male, aged 17- 20 years old, high school leaver student who is enrolled in a first year degree program paying HECS fees upfront. In the event of having older siblings, the student did not elect to follow the same tertiary path in terms of degree program, discipline or university. Both of his parents were born overseas. The undergraduate student's father has completed a university degree as the highest level of educational attainment and his mother has completed High School. Both of his parents are professionally employed and the combined family income falls in to the $90 000 income bracket.

The undergraduate student's choice behaviour appears to be influenced by his:

- Age: χ^2 (2) (N =304) = 24.04 $p<0.5$.

- Country of birth; χ^2 (4) (N =304) = 28.78 $p<.05$.

- Gender; χ^2 (2) (N =304) = 25.5 p< .05.
- First preference for a degree program; χ^2 (2) (N= 304) =24.857 p< .05.
- Educational attainment of his mother χ^2 (6) (N= 305) = 16.04 p< .05.
- Professional occupational status of his father χ^2 (2) (N= 304) = 16.83 p<.05.
- Parents combined income; χ^2 (4) (N= 304) = 20.657 p<.05.

4.3 Topic 2: A Profile of Respondents' Preferences University, Program and Discipline

Across all the portfolios, 42% of students reported the academic 'program' offered as their first consideration in preference selection once they made a decision to enter into higher education. Consideration for their choice of university was closely followed at 41% however consideration towards the discipline ranked last at almost 17%.

Table 4.12: First Consideration in selecting University, Discipline, and Program

		First Consideration			Total
		University	Discipline	Program	
Portfolio	Business	66	20	42	128
	Design and Social Context	26	17	44	87
	Science, Engineering and Technology	33	14	42	89
Total		**125**	**51**	**128**	**304**
Percent		**41.0**	**17.0**	**42.0**	**100**

Table 4.12 indicates some similarities in the order of the overall preferences were paralleled at the portfolio level. Both DSC (50%) and SET (47%) portfolios reported the degree 'program' as their first consideration once they made their made a decision to enter higher education. This was followed with second consideration for the 'university' at 30% for DSC and 37% for SET. The 'discipline' ranked as the last consideration (DSC 20%,

SET 15%) in the decision making process of the respondents. However, almost 52% of students enrolled in the Business portfolio reported 'university' as their first consideration in their decision making process; followed by 'program' consideration at 33% and 'discipline' at 15% which ranked last across all portfolios. In other words, once the decision was made to pursue tertiary studies, students currently enrolled in DSC and SET expressed preference to enrol in a *specific* degree program rather than the university or the discipline field. Whereas students currently enrolled in Business gave first consideration to the university of their preference, then the specific degree programs offered at that particular university and lastly the discipline. James et al. (1999, p.23) explains that undergraduate students tend to declare their preferences as a 'course–institution' combination and therefore consider 'course at this university' as a one stage single consideration rather than a two stage (course then institution) process. Prospective student placing emphasis on gaining a place in a university, perhaps at the expense of forgoing a degree program of their first preference was also found to be in the 'minority' in a study outcome undertaken by James et al. (1999) to investigate factors influencing the choices of prospective undergraduate students.

Table 4.13: First Preferences of Degree Programs

		Preferences		Total
		yes	**no**	
Portfolio	Business	101	27	128
	Design and Social Context	81	6	87
	Science, Engineering and Technology	54	35	89
Total		**235**	**69**	**304**
Percent		**77.0**	**27.0**	**100**

χ^2 (2 N=304) =24.857 p= .000

Table 4.13 displays information pertaining to whether students' are currently enrolled in a degree program of their first preference or other than their first preference. In asking the question, "Are you currently enrolled in the degree course of your first preference?" a strong majority of students indicated an affirmative response. Almost 77% of all students surveyed reported they *are* currently enrolled in the degree program of their first preference. This result is slightly higher than the findings of Krause et al. (2005) that

indicated over a ten year period, the percentage of respondents receiving their first choice has not varied substantially, 'remaining consistently around 68-69 per cent'. Another pertinent finding of the report suggested students who do not receive their 'first course preference are likely to experience some frustration and dissatisfaction' (p.12).

In terms of portfolios, all the portfolios paralleled a similar result with DSC reporting a very strong majority of 92% of first year students currently enrolled in the degree programs of Bachelor of Fine Arts, Bachelor of Art and Bachelor of Communication are in the degree programs of their first preference. This contrasted with 5% of students who stated they are currently enrolled in a degree program 'other than their first preference'. Business reported 79% of students currently enrolled in the degree of Bachelor of Business are enrolled in the degree program of their first choice. Students currently enrolled in SET in the degree programs of Bachelor of Applied Science/Applied Chemistry, Bachelor of Applied Chemistry/Chemical Engineering and Bachelor of Engineering reported almost 61% of students are enrolled in a degree program of their first preference.

To examine this outcome further, a chi square test for relatedness explored the question: "*Is there a relationship between a student's first preference of a degree program and their decision to pursue a particular degree program"*? A chi square statistic of 24.85 with a probability level of .000 indicated the significance value is well below the alpha value of .05 and is therefore significant.

In addressing the hypothesis:

H2h: A student's first preference is a factor in determining their particular preference selection set.

A student's first preference can be considered as an influencing factor when undergraduate students make their decision to pursue a particular discipline in the tertiary field. Based on this assumption, a student who is currently enrolled in a degree program of their first preference is more likely to be a student enrolled in DSC than students enrolled in either Business or SET portfolio.

For this thesis, of the students who *did not* enrol in their first preference for a degree program, 46% enrolled in the same discipline as their first preference. For example *Respondent 267* is currently enrolled in Bachelor of International Studies, however their first preferences was a Bachelor of Arts (Criminal Justice Administration). The remaining 54% of current students are enrolled in a degree program that is different from their first preference. For example, *Respondent 92* is currently enrolled in a Bachelor of Engineering however their first preferences was a Bachelor of Architectural Design.

At a portfolio level, of the 5% of DSC students who did not enrol in their first degree preference, only 2% enrolled in a different discipline area. However students from both Business (13%) and SET (20%) indicated the majority elected to enrol in a degree program in a different discipline to their first preference. Of the 21% who did not enrol in their first degree preference in Business, only 8% are still enrolled in the same discipline as their first preference, however in a different degree program. Similarly for SET of the 40% who did not enrol in their first degree preference 19%, are still enrolled in the same discipline as their first preference, however in a different degree program.

The outcome of these results lend minor support to a study conducted by Harvey-Beavis and Elsworth (1998, p.53) who found an applicants' first preference is a fair guide to an applicant's field of interest, and that most applicants tend to persist with the field of their first preference in their lower order preferences. In terms of this thesis, only students enrolled in DSC appeared to be driven by the interests of their first preferences to lower preferences. The implication of an applicant's field of interest remaining relatively stable over time is further discussed by Harvey-Beavis and Elsworth (1998). The authors extend this point and argue the relevancy for educational strategists in terms of understanding and influencing enrolment patterns in different disciplines. Enrolment patterns can translate to 'clusters of courses' deemed by prospective applicants to consist of similar courses with important features in common. Accordingly, applicants with artistic interests would in principle fill up their quota of preferences with artistic type courses on offering. This illustrates the scope for segmenting the market and approaching the recruitment of the distinct 'course clusters' with tailor made strategies. Worthington and Higgs (2004) also point out the relevancy of recognising patterns of interest expressed by students in their choice behaviour for policy formation.

4.4 University Preference

Table 4.14: University Preference: RMIT

		RMIT as a Preferred University					Total
		No consideration	First Preference	Second Preference	Third Preference	Fourth Preference	
Portfolio	Business	2	71	36	18	1	128
	Design and Social Context	0	74	11	2	0	87
	Science, Engineering and Technology	2	50	18	14	5	89
Total		**4**	**195**	**65**	**34**	**6**	**304**
Percent		**12.0**	**64.0**	**21.0**	**11.0**	**2.0**	**100**

In terms of university preference, students were asked to consider seven universities and indicate which university they considered applying to as their first to fourth preference. The six universities comprised of Latrobe University, RMIT University, Melbourne University, Monash University, Swinburne University and Victoria University. In terms of indicating a preference, 94% of students gave *no consideration* to Victoria University. This was followed by *no consideration* for Swinburne University (89%), Deakin University (76%); Latrobe University (63%); the University if Melbourne (46%); Monash University (40%); and RMIT University (1%). As a first preference consideration in applying to universities, RMIT University was considered by 64% by all first year undergraduate students (refer to Table 4.14).

Examining the three portfolios, RMIT University was considered by 56% of Business students as their *first preference* and by 28% as their *second preference*. This was followed by Monash University 24% and Latrobe University considered by 20% as a fourth preference. For DSC enrolled students, RMIT University was considered by 85% as their first preference. This was followed by the University of Melbourne at 26%, Monash University at 20% and the fourth consideration was Latrobe University at 10%. Similarly for students enrolled in SET, as for Business students, RMIT University scored a percentage of 56% for first preference consideration. This was followed by University of Melbourne at 21%, Monash University at 22% and fourth preference allocation was for Latrobe University at 15 %.

4.4.1 Summary Snapshot Topic two

Overview of Preferences University, Program and Discipline of a First Year Undergraduate Student

A first year undergraduate student at RMIT University considers the degree 'program' offered taking initial preference in his choice behaviour once he made a decision to enter in to higher education. This was followed by consideration for the 'university'. The degree program the undergraduate student is currently enrolled was the degree of his first preference as was consideration towards RMIT University as the most preferred university. The student will tend not to persist with lower order preferences of the degree program and/ or discipline of his first preference.

4.5 Topic 3: Profile of Psychological Construct: Personal Values Importance Scale

Analyses of the top five preferred values (with the most relevant statement) are presented in Tables 4.15 to 4.18. Initially an analysis of the mean and standard deviation was performed for all students and then students by portfolios.

Respondents were asked to rate on a seven point Likert-type scale (1= strongly disagree to 7= strongly agree) personal values using Kahle's (1988) List of Values (LOV) as to the extent the respondent agreed with five parenthetical definitions applied to each of the List of Values on the survey instrument. The parenthetical definitions were an outcome of conducting an exploratory survey and were expressed in terms of importance.

4.5.1 All Portfolios: The Top Five Personal Values

From all the portfolios, the personal value reported which had the highest level of agreement on was *self fulfilment* (M=6.21, SD=1.10), followed by *Self Accomplishment,* (M=6.05, SD=.1.08), *Self Respect,* (M=6.03, SD=1.09), *Fun and Enjoyment in life,* (M=5.96, SD=1.09), *Excitement* (M=5.81 SD=1.21), *Sense of Belonging* (M=5.71, SD=1.31), *Security* (M=5.62, SD=1.28), *Warm relationship with others* (M=5.58, SD=1.31 and *Being Well Respected* rated the lowest (M=5.05, SD=1.53) indicating an almost neutral response.

Table 4.15: All Portfolios: The Top Five Personal Values

1.	Self fulfilment (A1) : "*It is important to feel happy with yourself and where you are life"* (Internal)
2.	Self Accomplishment (C5): *"Finishing something makes me feel content and satisfied"* (Internal)
3.	Self Respect (B1): *"It is important to have a sense of dignity about one self"* (Internal)
4.	Fun and enjoyment in life (H2): "*Doing things for myself which makes me happy is important to me"* (Internal)
5.	Excitement (I2): "*It is important to me to look forward to something"*(Internal)

Unquestionably, undergraduate students across all the portfolios consider internal values of utmost importance when considering how personal values may influence their underlying reason for pursuing a particular choice behaviour.

4.5.2 Business Portfolio: The Top Five Personal Values

Table 4.16: Business: The Top Five Personal Values

1.	Sense of Accomplishment (C1) "*I get a deep sense of satisfaction form achieve a personal goal" (Internal)*
2.	Self Respect: (B5) "*Being worthy, confident and proud are beliefs that are important to me*"(Internal)
3.	Fun and Enjoyment in Life (H1)"*Getting the most out of life is very important to me"* (Internal)
4.	Self Fulfilment (A1) "*It is important to feel happy with yourself and where you are in life"* (Internal)
5.	Sense of Belonging (E5) " *Being welcomed and accepted for who I am gives me a deep sense of belonging "* (External)

Business students reported *sense of accomplishment* (M=6.11, SD=1.24) as the value this cohort agreed most on in terms of the five value statements. This was followed by *Self Respect* (M=6.09 M=1.16), *Fun and Enjoyment in life* (M=6.07, SD=1.14), *Self Fulfilment* (M=6.070, SD=1.28), *Sense of Belonging* (M= 6.00, SD= 1.31), *Excitement* (M=5.74,

SD=1.26), *Warm Relationship with other* (M=5.70, SD=1.19), *Being Well Respected* (M=5.57, SD=1.40) and *Sense of Security* scored the lowest (M=5.296, SD=1.088) average.

4.5.3 Design and Social Context: The Top Five Personal Values

Students enrolled in DSC strongly favoured and agreed upon *self fulfilment* (M=6.36, SD=.935) as the most important value. This was followed by *sense of accomplishment* (M=6.05, SD=1.06), *self respect* (M=6.02, SD=1.06), *fun and enjoyment in life* (M=5.87, SD=1.07), *excitement* (M=5.82 SD=1.11), *sense of belonging* (M=5.61, SD=1.16), *warm relationships with other* (M=5.47 SD= 1.25), *security* (M=5.40 SD= 1.08) and *being well respected* reported a predominately neutral response (M=4.81 SD=1.46).

Table 4.17: Design and Social Context: The Top Five Personal Values

1.	Self Fulfilment (A1) : "*It is important to feel happy with yourself and where you are in life"* (Internal)
2.	Sense of Accomplishment (C5*) "Finishing something makes me feel content and satisfied"* (Internal)
3.	Self respect (B3) *"It is important to stand up to what you believe"* (Internal)
4.	Fun and Enjoyment in Life (H2) "*Doing things for myself which makes me happy is important to me"* (Internal)Self respect (B3*) "It is important to stand up to what you believe"* (Internal)
5.	Excitement (I2) "*It is important to me to look forward to something* (Internal)

4.5.4 SET: The Top Five Personal Values

Self fulfilment (M=6.25 SD=.935) was the internal personal value Science, Engineering and Technology students reported as having the greatest level of consensus. This was followed by S*ense of Accomplishment* (M=6.00, SD=1.06), *Fun and Enjoyment in life* (M=6.03 SD=1.00), *Self Respect* (M=5.96 SD= 1.06), *Excitement* (M=5.77 SD= 1.11), *Warm Relationships with others* (M=5.53 SD=1.33), S*ense of Belonging,* (M=5.69, SD=143 and *Being Well Respected* reported as the least important personal value (M=5.07 SD=1.58).

Table 4.18: SET: The Top Five Personal Values

1.	Sense of Accomplishment: (C5*) "Finishing something makes me feel content and satisfied"* (Internal)
2.	Self fulfilment (A1) : "*It is important to feel happy with yourself and where you are in life"* (Internal)
3.	Fun and enjoyment in life (H2): "*Doing things for myself which makes me happy is important to me"* (Internal)
4.	Self respect (B3*)*: *"It is important to stand up to what you believe"* (Internal)
5.	Excitement (I5): "*I like to go to places that involve exciting activities"* (Internal)

4.5.5 Summary of Personal Values

The descriptive analysis indicates that all students across the different portfolios and enrolled in different degree programs have shown strong agreement towards a common set of values. More specifically 80% of the personal values preferred by all students currently enrolled in three academic portfolios were categorised under the 'internal' value dimension. The value of *self fulfilment* (M= 6.25) represented by the statement definition of *It is important to feel happy with yourself and where you are in life,* differentiated itself from other preferred internal values. Students enrolled in the Business portfolio were the only cohort of students who reported the importance of an external value in their top five values of importance.

4.5.6 Relationship of Personal Values to Demographics

Prior studies investigating the influence of personal value and demographics (Shoham et al. 1998; McCarty and Shrum 1993; Rokeach 1973) in different contexts suggest gender differences in respect to the importance placed on particular personal values. McCarty and Shrum (1993) indicated gender differences related to category preferences and such preferences were partly a function of gender. For example, women who placed importance on personal gratification tended to watch more television and men who placed a greater emphasis on the value of security watched a higher proportion of news programming.

The assumption then, for this thesis is an expectation that gender is considered a significant factor in terms of associating with other demographic factors. Also of relevance is the capacity of gender as a differentiating variable in student choice behaviour in expressing preferences for a particular degree program, discipline and university.

To examine this outcome further, a Mann-Whitney U test (Wilcoxon rank sum W test) was used to explore the question; *Do males and female respondents differ in terms of the levels of importance placed on personal value*s? The outcome of the Mann-Whitney U test suggested there are statistical differences in the personal values scores of male and female respondents. Of the nine values, only two values, *fun and enjoyment in life* z = -1.35 p> .05. and *excitement* z = -.465 p>.05 were not found to be statistically different. Statistically significant were the values of *self fulfilment* (z=-3.39 p=.001), *self respect* (z= -2.68 p=.007), *sense of accomplishment,* (z = - 2.94 p=.003); *security* (z = -3.86 p=.000), *sense of belonging* (z =- 4.90 p= .000, *warm relationships with others* (z = - 3.93 p= .000) and *being well respected* (z = -2.90 p= .004). The mean rank scores indicate a significant difference with female respondents allocating a higher ranking for all values. The findings show some similarities with Shoham et al. (1998) who reported significant differences in value importance between males and females particularly for the values of; *excitement*, *warm relationships with others*, *being well respected*, *security,* and *self respect* in a population of Israeli consumers.

In sum, this outcome provides further understanding of the influential role gender plays in a student's preferential choices of which particular program to study and discipline and the attributed effect of gender upon differences that exist in personal values.

4.6 Motivation

An analysis of the top five preferred motivation are presented in Table 4.19. Initially an analysis of the mean and standard deviation was performed for all students and then students by portfolios. Respondents were asked to rate on a seven point Likert-type scale ('1'= not important at all' and '7'=extremely important') a list of seventeen motives to indicate how important the outlined reasons were in making their decision to come to university.

4.6.1 All Portfolios: The Top Five Motivations

First year undergraduate students entering university to pursue a higher education degree are extrinsically driven towards *getting a degree (that) will allow me to get the job I want,* (M= 5.79, SD= 1.37) and *enable me to get a prestigious job* (M= 5.75, SD= 1.52); *earn more money* (M=5.56, SD=1.48); and *to follow my chosen career* (M=5.47, SD= 1.60). The only intrinsic motive (g) *I want to become a better educated person* deemed as important (M=5.61, SD=1.35) reflects an engagement in education to achieve intellectual development and personal goals (Byrne and Flood 2005). The motivation that was deemed the least important was the amotivational reason (d) of *my friends are going to university* (M=2.96, SD= 1.76).

Table 4.19: All Portfolios: The Top Five Motivations

1.	Extrinsic (m) "*Getting a degree will allow me to get the job I want"*
2.	Extrinsic (a) "*A degree will enable me to get a prestigious job*"
3.	Intrinsic (b*) " I want to become a better educated person"*
4.	Extrinsic (g) "*Gaining a degree will allow me to earn more money"*
5.	Extrinsic (j) "*I need a degree to follow my chosen career"*

4.6.2 Business: The Top Five Motivations

For Business students, the attainment of a goal translates to *getting a degree* which will allow [the respondent] to get a *prestigious job,* (M=6.41, SD=.846)*, earn more money,* (M=6.00, SD= 1.14), in *the job I want* (M=5.77, SD=1.381); and *follow my chosen career (*M=5.71, SD= 1.43). Similar to the majority of students, the most important intrinsic motive was (b) *I want to become a better educated person* (M=5.64, SD=1.36). The amotivated statement of (d) *I don't want to get a job yet rated* the lowest in terms of importance (M=2.94, SD =1.74). These outcomes suggest first year undergraduate students have very clear motives for enrolling in a Business degree.

Table 4.20: Business: The Top Five Motivations

1.	Extrinsic (a) "*A degree will enable me to get a prestigious job*"
2.	Extrinsic (g) "*Gaining a degree will allow me to earn more money"*
3.	Extrinsic (m) "*Getting a degree will allow me to get the job I want"*
4.	Extrinsic (k) "*A university degree is really important for me*"
5.	Extrinsic (j) "*I need a degree to follow my chosen career"*

4.6.3 DSC: The Top Five Motivations

Fazey and Fazey (2001) reported commencing students' major intrinsic interest for studying appears to be that of wanting to learn about new and interesting things. Students enrolled in DSC epitomised this notion through actively engaging in learning out of curiosity, interest or enjoyment; *I get a lot of enjoyment out of learning new things* (M=5.77 SD=1.254); or in order to achieve their own intellectual development and personal goals, *I want to become a better educated person* (M= 5.81 SD=1.28); and *I will enjoy the academic challenge of a degree course* (M=5.389 SD= 1.315) (Byrne and Flood 2005). The most important intrinsic motivation of, *I want to become a better educated person* for DSC was also evident across the other two portfolios. The two extrinsic motives (m) (M=5.49, SD=1.52) and (k) (M=4.71, SD=1.73) also indicate the relevance of careers and future job prosperity to this cohort. Similar to Business students, the amotivated statement of (d) *I don't want to get a job yet,* rated the lowest in terms of importance (M=2.47, SD= 1.49).

Table 4.21 DSC: The Top Five Motivations

1.	Intrinsic (b) *"I want to become a better educated person"*
2.	Intrinsic (q) *"I get a lot of enjoyment out of learning new things"*
3.	Extrinsic (m) "*Getting a degree will allow me to get the job I want"*
4.	Intrinsic (f) *"I will enjoy the academic challenge of a degree course"*
5.	Extrinsic (k) "*A university degree is really important for me"*

First year students enrolled in DSC were predominately intrinsically driven to pursuing an undergraduate degree. Intrinsic motives derive from cognitive interest in a particular subject, from an individual's academic history, from within the individual and are congruent with the individual's sense of self and purpose (Byrne and Flood 2005, Bennett 2004, Fazey and Fazey 2001). Furthermore, intrinsic motivation tends to have a greater effect on long term outcomes (Long et al. 2006). For this cohort of students, the underlying motivation to enrol at a university is the participation and engagement in education for the desire to learn for the sake of understanding. The statement, *I want to become a better educated person* (M= 5.816 SD=1.289) rated the highest in terms of importance.

4.6.4 SET: The Top Five Motivation

Similar to Business students, undergraduate students enrolled in SET are predominately extrinsically driven in their pursuit of a higher education degree. The principle reasons given were clearly vocationally driven seeking a number of outcomes including, financial rewards; g*aining a degree will allow me to earn more money* (M=5.94, SD=.945)*,* job availability and job security, *getting a degree will allow me to get the job I want* (m) (M= 5.91, SD=1.29) and opportunities for promotion and flexible career options; *a degree will enable me to get a prestigious job* (M=5.94, SD= .945) and; *I need a degree to follow my chosen career* (M=5.66, SD=1.36). The most important intrinsic motivation of *I want to become a better educated person* for DSC was also evident across the SET portfolio. As per the other portfolios, the motivation of; *I want to become a better educated person* (M= 5.33, SD=1.40) was the most important intrinsic motive. An identical outcome was indicated for the least important amotivation motive of; *I don't want to get a job yet* (M=2.94, SD=1.76).

Table 4.22: SET: The Top Five Motivations

1.	Extrinsic (g) "*Gaining a degree will allow me to earn more money"*
2.	Extrinsic (m) "*Getting a degree will allow me to get the job I want"*
3.	Extrinsic (a) "*A degree will enable me to get a prestigious job*"
4.	Extrinsic (j) "*I need a degree to follow my chosen career*
5.	Intrinsic (b*) " I want to become a better educated person"*

4.6.5 Summary of Motivation Construct

The pursuit of learning to achieve an external goal and/or outcome is of no surprise. Bennett's (2004) investigation of 284 first-year undergraduate Business studies students regarding their motives for deciding to participate in higher education sought 'financial and tangible benefits'. The undergraduate Business group of students were strongly associated with a *goal orientation* involving assumptions about better job prospects and higher pay. More reflective of students enrolled in DSC and to a lesser degree of students enrolled in SET was Bennett's (2004) *learning orientation*. This motive concerned the desire to learn and appeared to exert significant impact on enrolment decisions. In consensus across all three portfolios was the inconsequential impact of amotivation, which Bennett (2004) identified as *activity orientation* (amotivation) and similarly found was not at all important.

Likewise, Byrne and Flood (2005) found that first year Irish accounting students' motives, on their decision to come to university reported *vocational* as a principle reason with almost 90% of students identifying career related factors as their reasons for choosing accounting. Additionally, over 75% of the sample cited their enjoyment of the subject in school and their desire to learn more about the subject as having a significant bearing on their decision to study accounting. These dual intrinsic motives reflected in a students' reason for pursuing a particular major were in contrast to RMIT Business enrolled students, however more reflective of students enrolled in DSC who expressed strong intrinsic influences in their choice behaviour.

Students enrolled in DSC differed in their priorities from students enrolled in Business and SET as this cohort of students were predominately intrinsically driven and less vocationally focused. However, there is also a common thread amongst the three portfolios pertaining to employment prospects as drivers to pursue higher education. The amotivation reason of *I don't want to get a job yet,* was considered unanimously the least important reason for choosing to go to university across all three portfolios, consistent with prior studies (Byrne and Flood 2005; Bennett 2004; Fazey and Fazey 2001). In fact not one amotivational reason was listed in any of the top five across all three portfolios. Deci (1972) describes amotivation as a state in which individuals have no desire to act. Vallerand et al. (1992) elaborates stating amotivated individuals perceive their behaviours as caused by forces outside their control such as parental influence. Conceptually, the results of this research point towards a cohort of first year undergraduate students who are

both intrinsically and extrinsically stimulated to act. This is a positive outcome as amotivated individuals tend to experience 'feelings of incompetence and expectations of uncontrollability' (Vallerand et al. 1999, p. 1008). Translated in terms of academic progress, such students may question their participation in higher education and may eventually cease participation in academic studies.

4.6.6 Relationship of Motivation to Demographics

Whitehead et al. (2006) identified a significant gender difference pertaining to *academic motivation* as a reason A level students were encouraged to apply to a specific university, in this case Cambridge University. Krause et al. (2005) identified female students in the sample tended to have stronger academic orientation and application towards their studies, a stronger sense of purpose and were more likely to be satisfied with their course. To examine this outcome further, a Mann-Whitney U test (Wilcoxon rank sum W test) was used to explore the question "*Do males and female respondents differ in terms of their motivational reasons in pursing higher education?"*

The outcome of the Mann-Whitney U test suggested there are statistical differences in the motivation scores of male and female respondents. Of the seventeen motivational reasons *all* three of the intrinsic reasons for pursing higher education were found to be statistically different between males and females. The intrinsic statements included; (b) *I want to become a better educated person* (z = -4.46 p= .000; (f) *I will enjoy the challenge of an academic degree* (z = - 3.93 p= .000); and (q) *I get a lot of enjoyment out of learning new things* (z =-2.75 p=.006). The mean ranks scores for female to male respondents respectively for motivation for (b) 172.2 versus 131.7; (f) 172.8 versus 133.9; and (q) 16.7 versus 139.5 clearly indicate a ranking difference. This outcome of this thesis supports Whitehead's et al. (2006) study that indicated female respondents were more likely to go into higher education for academic motivational reasons, such as *enjoying a course.*

4 .7 Selection Criteria

An analysis of the top five preferred selection criteria is presented in Table 4.24. Initially an analysis of the mean and standard deviation was performed for all students and then students by portfolios. Respondents were asked to rate on a seven point Likert- type scale

(where 1 was *not important at all* to 7 *extremely important*) how important a list of 14 selection criteria was in their decision to study at a university.

4.7.1 All Portfolios: The Top Five Selection Criteria

Across all portfolios, the most important selection criteria was *course suitability* (M=6.09, SD=1.15), followed by *job opportunities* (M=5.99, SD= 1.449), *program reputation* (M=5.71, SD=1.29), *university reputation* (M=5.46, SD=1.48), *location* (M=5.31 SD=1.55), *status and prestige* (M=5.72 SD=1.39), *entry requirements* (M=5.23, SD=1.49), *teaching qualifications* (M=5.13 SD=1.15), *university type* (M=4.96, SD=1.42), *university resources* (M=4.67, SD=1.63), *cost of fees* (M=4.11, SD=1.87) and the least important criteria being *family opinion* (M=3.90, SD=1.80).

Table 4.23: All Portfolios: The Top Five Selection Criteria

1.	Course suitability
2.	Job opportunities
3.	Programme reputation
4.	University reputation
5.	Location

4.7.2 Business Portfolio

As indicated in Table 5.24, Business students' reported *job opportunities* (M= 6.38, SD=1.21), as the most important selection criteria followed by *course suitability* (M=5.97, SD=1.22); *program reputation* (M=5.85, SD=1.17); *university reputation* (M=5.79 SD=1.32); *status and prestige* (M= 5.72, SD= 1.75); *location* (M= 5.46, SD= 1.62), *entry* (M= 5.46, SD= 1.452), *teaching qualification* (M= 5.20, SD=1.57), *university type* (M= 5.15, SD= 1.48), *range of course* (M=4.86, SD=1.57), *resources* (M= 4.73, SD= 1.74), *family opinion* (M= 4.33, SD= 1.75); *cost* (M= 4.29, SD= 2.01) and the least important criteria was *recreational facilities* (M=4.17, SD= 1.80).

Table 4.24: Business: The Top Five Selection Criteria

1.	Job opportunities
2.	Course Suitability
3.	Programme Reputation
4.	University Reputation
5.	University Status and Prestige

Business students' prioritising of *job opportunities* as the most important selection criteria were consistent with the findings of James et al. (1999, p.45) which found applicants for courses in the Business field differentiated themselves in terms of 'the relatively strong influence they attribute to considerations associated with a vocational, instrumentalist view of education'. 'The prestige of the field' is another relatively important consideration for Business applicants. The ordering of selection criteria suggests for Business applicants, academic quality and reputation is of utmost importance when considering where to study once a decision to undertake tertiary education is taken. Academic quality was expressed in terms of *course suitability* and reputation and prestige of the field in terms of the level of importance allocated to *university reputation, program reputation,* and *status and prestige of the university*. Owen (1977) defines reputation as an institution where success is possible and the quality of a student's performance will be respected by future employers. Business students appear less interested in what a university has to offer in terms of infrastructure resources as (library, computer labs, and/or classrooms) and recreational facilities. Also the external influence of *family opinion* appears to exert little importance in their selection criteria.

Furthermore, a study undertaken of Business undergraduates in 1988 by Turner (Soutar and Turner 2002, p.41) to determine their reasons for choosing to enrol at a particular university revealed a similar outcome to the results of this thesis. Business students stated the most important factors as; 'future job prospects, obtaining qualifications that were valued by employers, being able to use modern facilities, the standard of teaching and the international recognition of the university's program'.

4.7.3 Design and Social Context

As indicated in Table 4.25, first year students enrolled in DSC reported *course suitability* (M=6.48, SD= .874) as the most important selection criteria. This was followed by *program reputation* (M=5.98, SD=1.15), *location* (M= 5.49, SD=1.17); *job opportunities* (M=5.33, SD=1.75); *entry requirements* (M=5.26, SD=1.48), *university reputation* (M= 5.22, SD= 1.44); *teaching qualifications* (M= 5.21, SD = 1.55), *range of courses* (M= 4.94, SD= 1.48); *status and prestige* (M= 4.86, SD=1.37), *resources* (M= 4.72, SD= 1.38); *university type* (M= 4.72, SD= 1.489); *cost* (M= 3.93,SD=1.71), *facilities* (M= 3.59, SD= 1.73). The least important criteria was *family opinion* (M=3.35, SD=1.67).

Table 4.25: Design and Social Context: The Top Five Selection Criteria

1.	Course Suitability
2.	Programme Reputation
3.	Location
4.	Job Opportunities
5.	Entry Requirements

4.7.4 Science, Engineering and Technology

As indicated in Table 4.26, the most important criteria for students enrolled in SET was *job opportunities* (M=6.08, SD=1.19), mirroring Business students most important criteria also. This was followed by *course suitability* (M= 5.89, SD= 1.20), *program reputation* (M= 5.24, SD=1.47), *university reputation* (M=5.20, SD=1.65,), *status and prestige* (M= 5.02, SD=1.52), *teaching qualifications* (M= 4.94, SD= 1.65), *location* (M=4.93, SD= 1.72); *university type* (4.91, SD= 1.31), *entry* (M=4.87, SD= 1.52), *range of courses* (M= 4.69, SD= 1.401), resources (M=4.52, SD= 1.69), cost (M= 4.04, SD= 1.80), facilities (M= 3.95, SD= 1.71), and the least important criteria was *family opinion* (M=3.82, SD=1.85).

Table 4.26: SET: The Top Five Selection Criteria

1.	Job Opportunities
2.	Course Suitability
3.	Programme Reputation
4.	University reputation
5.	Teaching qualification

Students enrolled in SET portfolio indicated very similar selection criteria to Business students as to what they deemed important. Science and Engineering applicants tend also to be strongly influenced by employment rates, institutional image and prestige than other applicants (James et al. 1999). Students enrolled in SET were the only cohort who considered *teaching qualifications* as an important selection criterion. This may relate to the finding (James et al. 1999) that Science applicants are characterised by the emphasis they attach to an institution's research reputation and the opportunities for higher degree study.

4.7.5 Summary of Selection Criteria

Overall the results indicate first year undergraduate students enrolled across three portfolios focus strongly on Factor 1: *Reputation Influence*; followed by Factor 4 *External Influences* and Factor 3 *Entry Influence*. All three factors were positively correlated. Factor 1 *Reputation Influence* was significantly correlated to Factor 3 *Entry Influence* ($r = .339$ $p < 0.01$) and to Factor 4 *External Influences* ($r = .220$ $p < 0.01$). Factor 3 *Entry Influence* is also significantly correlated with Factor 4 *External Influences* ($r = .244$ $p < 0.01$).

Of the least importance are a university's infrastructure resources and facilities offered and to a degree the associated social and cultural *campus life.* This is of interest as some infrastructural elements as laboratory equipment and the computing resources have been previously reported to be 'good indicators' of top-quality institutions (Veloutsou et al. 2004). A neutral status of importance was allocated to *cost of fees* and or the costs associated with study at the university and *university type*.

4.7.6 Relationship of Selection Criteria and Gender

To further apply the assumption that gender is significant as a differentiating variable in student choice behaviour, a Mann-Whitney U test (Wilcoxon rank sum W test) was used to explore the question "*Do males and female respondents differ in terms of the importance allocated to selection criteria"?* The outcome of the Mann-Whitney U test suggested there are statistical differences in the selection criteria scores of male and female respondents. Of the fourteen selection attributes, four attributes were suggested as statistically different between males and females. The attributes of (g) family opinion ($z = -2.63$ $p = .008$), (i) resources; ($z = -2.23$ $p = .025$), (l) teaching qualifications ($z = -2.35$ $p = .018$), and (m) program reputation ($z = -2.51$ $p = .012$) indicated female respondents allocated a higher ranking towards these attributes.

4.7.7. Summary Snapshot Topic Three

Overview of Psychological Constructs of a First Year Undergraduate Student

In terms of his personal values, the undergraduate student upheld internal values over consideration towards external values in terms of importance. The value of *self fulfilment* was the most important value, and the value statement of; *It is important to feel happy with yourself and where you are in life* was the most strongly agreed upon as representative of 'self fulfilment'. Strongly extrinsically driven in his pursuit of expressing a preference towards a particular degree program, the undergraduate student enrolled in a particular degree program to facilitate the achievement of (m) *getting a degree will allow me to get the job I want.* In terms of his selection criteria, he considers F1 *Reputation; F3 Entry* and F4 *External* as the most important influences in his choice behaviour.

<u>A Mann-Whitney U test suggested:</u>

- There are statistical differences in the personal values scores of male and female respondents for the values of 'self fulfilment', 'self respect', 'sense of accomplishment, 'security', 'sense of belonging', 'warm relationships with others' and 'being well respected' .

- There are statistical differences in the motivation scores of male and female respondents in all three of the intrinsic reasons for pursing higher education of (b) *I want to become a better educated person*, *I will enjoy the challenge of an academic degree* and (q) *I get a lot of enjoyment out of learning new things*.

- There are statistical differences in the selection criteria scores of male and female respondents in the attributes of (g) family opinion (z = -2.63 p= .008); (i) resources;*"* (z = -2.23 p= .025); (l) teaching quality (z = - 2.35 p= .018): and (m) program reputation (z = - 2.51 p= .012).

4.8 Hypothesis Tests

The second set of hypotheses proposed the likelihood of demographics and socioeconomic variables is an important influence to a particular preference selection set. A summary of results is depicted in Table 4.27.

Table 4.27: Hypotheses Set Two- Descriptive Statistics Non- Parametric Tests

Hypotheses Set Two- Descriptive Statistics Non- Parametric Tests	
H2a: Gender is a factor in determining a student's particular preference selection set	Supported
H2b: Age is a factor in determining a student's particular preference selection set	Supported
H2c: Country of Birth is a factor in determining a student's particular preference selection set	Supported
H2d: A mother's particular educational level is a factor in determining a student's particular preference selection set	Supported
H2e: A father's particular educational levels is a factor in determining a student's particular preference selection set	Not Supported
H2f: A mother's occupational status is a factor in determining a student's particular preference selection set.	Not Supported
H2g: A father's occupational status is a factor determining a student's particular preference selection set.	Supported
H2h: Parental combined income levels are a factor in determining a student's particular preference selection set	Supported
H2i: A student's first preference is a factor in determining a student's particular preference selection set	Supported

4.9 Application of EFA

This section examines the psychometric properties of the three scales; Personal Values Influence Scale (PVIS); Motivation Influence Scale (MIS) and Selection Criteria Influence Scale (SCIS) by testing the proposed theoretical constructs and their indicators. Exploratory factor analysis (EFA) was used as a tool of analysis to serve three primary purposes that of: examining underlying patterns of relationships existing amongst the variables, to provide operational definitions for observed variables for structural equation modeling and regression scores for multinomial linear regression and to facilitate the testing for the validity and reliability of a measurement instrument.

The sample size for this study of 304 respondents is within the general rule of at least 300 cases. As suggested by Tabachnink and Fidell (2007), an initial stage in factor analysis is to address the strength of inter-correlations among the items and the associated statistics. Three indices were used to assess the matrix properties of each measurement scale. The first index was inspecting the correlation matrix. The purpose of examining the correlation is to identify whether the variables are related. An inspection of the correlation matrix indicates all items have at least one correlation exceeds 0.3 making the matrix suitable for factoring (Coakes and Stead 2007). The other two indices were Bartlett's test of sphericity and Kaiser Meyer-Olkin measure of sampling adequacy (KMO). Bartlett's test of sphericity tests the null hypothesis that there are no correlations amongst the variables. If this hypothesis is rejected because the observed significance is small (<.05), the use of factor analysis may not be appropriate. The KMO measure is an index for comparing the magnitudes of the observed correlation coefficients against the magnitudes of the partial correlations. The values range between 0 and 1 where small values of KMO suggest factor analysis is not appropriate.

Based on prior research (Homer and Kahle 1988, Veloutsou et al. 2004), the latent root criterion technique for extract significant factor scores within each dimension was employed. Nine factor scores with eigenvalues greater than one were presented as substitutes for the original surveyed variables. By running a separate analysis for each construct to establish a single eigenvalue above one, convergent validity was also verified. The decisional rules applied to identify variables required a factor loading of at least .50 and for that variable not be split loaded on another factor (Hair et al. 1998). Turner and

Reisinger (2001, p.19) recommended a high loading of at least 0.6 when dimensions are 'to form the basis of structural equation modeling'.

4.10 Personal Values Importance Scale (PVIS)

Inspection of the correlation matrix ensured all items have at least one correlation greater than 0.03. Table 4.28 showed there was significant correlation between the variables. Bartlett Test of Sphericity is highly significant ($p<.05$) therefore rejects the null hypothesis suggesting the nine value constructs do not equally relate to each other. Kaiser-Meyer-Olkin Measure of Sampling Adequacy ranges is .845, which according to Kaiser's (1974) guidelines can be considered as *meritorious*. In sum, the indices suggest the use of factor analysis is an appropriate analysis technique for data examination.

Table 4.28: KMO and Bartlett's Test for PVIS

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.845
Bartlett's Test of Sphericity	Approx. Chi-Square	1240.265
	df	36
	Sig.	.000

Adopting the approach of Homer and Kahle (1988), a principal component factor analysis with varimax rotation matrix was performed using SPSS 15. Nine construct items from the PVIS scale for a sample of 304 first year undergraduate student were measured using listwise deletion of cases with missing values. Orthogonal rotation was used to maximise the variance of factor loadings by making high loadings higher and low loadings lower for each factor, offering ease of interpreting, describing and reporting results (Tabachnink and Fidell 2007).

The list of Values (LOV) is an abbreviated inventory and only includes nine terminal values (refer to Table 4. 29) The LOV typology, which has been extensively used in research pertaining to, values (Kropp et al. 2005; Chryssohoidis and Krystallis 2005; Jayawardhena 2004; Kim et al. 2002; Daghfous et al. 1999; Shim and Eastlick 1998; Kahle

1983; Homer and Kahle 1988). Empirical research suggests the nine LOV values have been further reduced into three latent constructs labelled (1) *individual internal values* (self fulfilment; excitement; sense of accomplishment; and self respect) (2) *inter-personal internal* (fun and enjoyment in life and warm relationship with others) and (3) *external dimension values* (sense of belonging; being well respected; and security) (Kropp et al. 2005; Jayawardhena 2004; Chryssohoidis and Krystallis 2005; Kim et al. 2002; Shim and Eastlick 1998; Kahle 1983; Homer and Kahle 1988). However, LOV values have also been identified by only two underlying dimensions (Kau et al. 1997; Shim and Eastlick 1988), that of internal and external dimensions. Beatty et al. (1991) argue the context may be an influencing factor on the number of underlying structures of LOV; hence factor loadings may vary slightly from one circumstance to the next.

Table 4.29: List of Values (LOV)

1. Self-respect;
2. Being well-respected
3. Self-fulfilment;
4. A sense of accomplishment
5. Fun and enjoyment in life
6. Excitement
7. Security
8. A sense of belonging
9. Warm relationships with others

In a recent study, Kropp et al. (2005) grouped LOV into three underlying dimensions; *internal values, external values* and *interpersonal values* when examining inter relationships between a numbers of constructs. These constructs included personal values, collective self esteem, and consumer susceptibility to interpersonal influence. Chryssohoidis and Krystallis (2005) employed a confirmatory factor analysis to test and validate the LOV scale in an organic food consumers' context in Greece. The 3-factor solution found one strongly internal personal factor called *self-respect* (self-fulfilment; self respect; sense of accomplishment and excitement), one internal/ apersonal factor called *enjoyment of life* (fun and enjoyment and warm relationships with others) and the other one external/interpersonal factor, called *belonging–security* (sense of belonging, security and

being well-respected). Jayawardhena (2004) also identified a three factor solution for LOV, however based on different factors. The resulting three factors were labelled *self direction* values (self respect and self fulfilment) *enjoyment* values (excitement, fun and enjoyment) and self *achievement* values (sense of accomplishment, being well respected and security). Daghfous et al. (1999) classified the LOV scale into three dimensions to investigate how values influence the process of adoption for new products. The three factors were labelled as *hedonistic values* (sensation seeking, pleasure and happiness in life, desire to establish warm relationships with others); *empathy values* (self-respect, respect by others, search for security, sense of belonging); and *values of self-actualisation* (personal development, sense of accomplishment).

However, Shim and Eastlick (1988) employing a principal component factor analysis, identified a two factor solution for the LOV scale. The first factor was labelled *self actualisation* and related to self respect, sense of accomplishment, security, being well respected and self fulfilment. The second LOV factor was labelled *social affiliation* comprising the values of excitement, sense of belonging and friendly relationships with others. Kau et al. (1997) classified respondents as *self-oriented* if they chose any of the first six values (self-respect, being well-respected, self-fulfilment, a sense of accomplishment, fun and enjoyment in life and excitement) as being the most important to them in life. Those who opted for the last three values (security; a sense of belonging and warm relationships with others) were considered as *group-oriented* in their outlook.

4.10.1 Factor Extraction

Using eigenvalues of 1.0 or greater, a two factor solution for the LOV scale was extracted (refer to Table 4.30) explaining 63.3% of the variances in the variables. The highest factor loading for each item against the two factors is underlined. The importance of a factor (or set of factors) is evaluated by the proportion of variance of covariance accounted for the factor after rotation. The internal consistencies of the subscales were assessed with the use of Cronbach's α for each of the two indices (.849 and .792). Both factors exceeded the 0.70 criteria (Nunnally 1994) therefore demonstrating acceptable scale reliability.

A two-factor outcome differentiated from Homer and Kahle (1988) empirical results. Through testing a causal model of value-attitude-behaviour hierarchy, Homer and Kahle (1988) further reduced the nine values into three latent constructs labelled (1) *individual internal values* (self fulfilment, excitement, sense of accomplishment and self respect) (2) *inter-personal internal* (fun and enjoyment in life and warm relationship with others) and (3) *external dimension* (sense of belonging, being well respected and security). The outcome of this thesis lends support to the theoretical underlying dimensions of *internal and external* to values (Kahle 1983). Moreover, past research (Kahle 1983) suggests LOV may be reduced to a smaller number of underlying dimensions given the consideration of situational factors which may cause different dimensions to be important in different contexts.

Table 4.30: Rotated Component Matrix (a) for PVIS

Construct	**Component**	
	Factor 1	**Factor 2**
VA (Self fulfilment)	**.820**	.241
VB (Self Respect)	**.775**	.234
VC Sense of Accomplishment	**.757**	.286
VD (Security)	.340	**.585**
VE (Sense of Belonging)	.214	**.869**
VF (Warm Relationships with others)	.299	**.737**
VG (Being Well respected)	.113	**.789**
VH (Fun and Enjoyment in Life)	**.731**	.280
VI (Excitement)	**.714**	. 114
Sum of squares (eigenvalue)	4.455	1.247

The values which have high loadings on Factor 1 are VA, VB, VC, and VH. These loadings suggest they relate to *internally* oriented values, the values they were designed to measure. The value of VI (*inter-personal internal*) is also included in Factor 1 due to its high loading. Therefore Factor 1 is termed *Internal values*. Interpersonal values combine

some aspects of both internal and external values; however, by definition, they focus upon interactions between people.

Values VE, VG, VF and VD have high loading for Factor 2. These loadings suggest they relate to *externally orientated* values. The value of VF (*inter-personal internal*) is also incorporated Factor 1 due to its high loading. Therefore factor 2 is termed *External values*. People who consider interpersonal values important might be more likely to place a higher value on dyadic relationships and, perhaps, might care more about the other person's opinion or evaluations (Kropp et al. 2005).

4.10.2 Summary of PVIS Scale

PVIS scale has differentiated between internally oriented values and externally orientated values in a two factor solution relevant to this sample of first year undergraduate students. Both the internal and external values scale has incorporated the inter-personal internal values. The factor solution output is consistent with the theoretical findings suggesting internal and external dimensions to values (Homer and Kahle 1988).

4.11 Motivation Importance Scale (MIS)

Table 4.31 shows there is significant correlation between the variables since the Bartlett Test of Sphericity is highly significant ($p<.0$) and therefore rejects the null hypothesis suggesting the nine value constructs do not equally relate to each other. Kaiser-Meyer-Olkin Measure of Sampling Adequacy ranges is .823, which according to Kaiser‘s (1974) guidelines can be considered as *meritorious*. In sum, the indices suggest the use of factor analysis is an appropriate analysis technique for data examination.

Table 4.31: KMO and Bartlett's Test for MIS

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.823
Bartlett's Test of Sphericity	Approx. Chi-Square	1761.323
	df	136
	Sig.	.000

Students are motivated to proceed to higher education by a variety of factors. Motivation pertaining to educational choices is frequently classified as either intrinsic or extrinsic and is referred to as 'the extrinsic-intrinsic' principle (Byrne and Flood 2005). Extrinsic motivation differentiate quite distinctly from intrinsic motivation as extrinsically motivated students orient themselves towards working for the ultimate goal of examinations, whereas intrinsically motivated students are concerned with expanding their knowledge. A number of studies conducted to investigate student motives (Byrne and Flood 2005; Krause et al. 2005; Bennet 2004; Bogler and Somech 2002; Fazey and Fazey 2001) for deciding to participate in higher education have found primarily students exhibit a mixture of intrinsic and extrinsic motivated behaviour.

4.11.1 Factor Extraction

An approximate initial solution was obtained using the Principal Components Analysis. This solution was then rotated using the orthogonal rotation algorithm Varimax. Using eigenvalues of 1.0 or greater, an initial four factor solution for the MIS was extracted (4.665, 2.499, 1.733, and 1.331). However, the *Academic Motivation Scale* (AMS*)* (Vallerand et al. 1992) specified three theoretical measures of motivation toward education, that of intrinsic, extrinsic and amotivation. In accordance with the literature review in this field, three factors were requested for extraction. The highest factor loading for each item against the two factors is underlined. Inspection of the rotated component matrix identified at least two extrinsic motivation items {(o) *Choosing the right institution will get me a head start in life;* factor loadings of .376, .405, and .312} and {(i) *To show I can be successful at university;* factor loadings of .414, .450 and .263} not meeting the decisional rules of a factor loading of at least 0.50, and showing evidence of split loaded on another factor above 0.35. This suggested the two items were not differentiating between factors and considered candidates for deletion (Hair et al. 1998). Each item was removed and the analyses were rerun. A three factor output for the MIS scale explained almost 54.5 % of the variances in the variables for fifteen items. Cronbach's α for the Factor 1 (.841); Factor 2 (.70); and Factor 3 (.716) exceeded the 0.70 criteria (Nunnally 1994) therefore demonstrating acceptable scale reliability.

As indicated from Table 4.32, motivation items which have high loadings on Factor 1 are (a) extrinsic; *A degree will enable me to get a prestigious job,* (g) extrinsic; *Gaining a degree will allow me to earn more money,* (j) extrinsic; *I need a degree to follow my chosen career,* (m) extrinsic; G*etting a degree will allow me to get the job I want*; (k) extrinsic; *A university degree is really important for me*. The loadings suggest the items relate to *extrinsically motivated* reasons to act. Therefore Factor 1 is termed *Extrinsic motivation.*

Table 4.32: Rotated Component Matrix (a) for MIS

	Component		
Motivation	**Factor 1**	**Factor 2**	**Factor 3**
a. Extrinsic : *A degree will enable me to get a prestigious job*	**.787**	.149	-.159
b. Intrinsic I *want to become a better educated person*	.207	.063	**.696**
c. Amotivation : *The chance to meet and make new friends*	-.005	.401	**.500**
d. Amotivation : *All my friends are going to university*	.031	**.740**	.021
e. Intrinsic : *I want to experience life as a university student-*	.170	**.511**	.416
f. Intrinsic : *I will enjoy the academic challenge of a degree course*	.005	.028	**.804**
g. Extrinsic : *Gaining a degree will allow me to earn more money*	**.752**	.273	-.152
h. Amotivation : *My parents want me to go to university*	.352	**.630**	-.138
j. Extrinsic : *I need a degree to follow my chosen career*	**.769**	.079	.110
k. Extrinsic : *A university degree is really important for me.*	**.693**	.185	.258
l. Amotivation : *I don't want to get a job yet*	-.130	**.640**	-.019
m. Extrinsic : *Getting a degree will allow me to get the job I want*	**.713**	-.122	.078
n. Extrinsic : *Attending the right institution expresses who I am*	-.217	**.523**	265
p. Extrinsic : *You can tell about a person from the institution they attend*	.171	**.635**	.107
q. Intrinsic : *I get a lot of enjoyment out of learning new things*	.179	.035	**.827**

Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 5 iterations.

Motivation items which have high loadings on Factor 2 are: (d) amotivation; *All my friends are going to university;* (e) amotivation; *I want to experience life as a university student*; (h) amotivation; *My parents want me to go to university;* (l) amotivation; *I don't want to*

get a job yet; (n) amotivation; *Attending the right institution expresses who I am;* and (p) amotivation; *You can tell about a person from the institution they attend.* The loadings suggest the items relate to amotivated reasons to act. Therefore Factor 2 is termed *Amotivation.*

Factor 3 Motivation items are (c) extrinsic; *The chance to meet and make new friends;* (b) intrinsic *I want to become a better educated person;* (f) *I will enjoy the academic challenge of a degree course*; and (q) intrinsic, *I get a lot of enjoyment out of learning new things.* The loadings suggest the items relate to intrinsically driven reasons to act. Although item (c) is considered an extrinsic motive, it appeared to load the highest with intrinsic motives. Therefore Factor 3 is termed *Intrinsic motivation.*

4.11.2 Summary of Factors of the MIS Scale

The MIS scale has differentiated between motivational influences in three typographies: *extrinsic* motivation, *intrinsic* motivation and *amotivation*. By requesting a three factor solution for the seventeen items, Factor 1 extrinsic motivation therefore incorporated the factor of 'external regulation' that emerged as the fourth factor. As a subcategory of extrinsic motivation, external regulation exists when the reasons for acting are stimulated and controlled by influences external to the task and the individual. Statements relating to intrinsic reasons for behaving were identified as Factor 3. In contrast to both extrinsic and intrinsic motivation, individuals are amotivated when they do not perceive contingencies between outcomes and their own actions. Thus statements reflective of behaviour perceived to be occurring out of the control of an individual is incorporated in Factor 2 of amotivation.

4.12 Selection Criteria Importance Scale (SCIS)

Table 4.33 shows there is significant correlation between the variables Bartlett Test of Sphericity is highly significant ($p<.05$) therefore rejects the null hypothesis suggesting the nine value constructs do not equally relate to each other. Kaiser-Meyer-Olkin Measure of Sampling Adequacy ranges is .787, which according to Kaiser's (1974) guidelines can be

considered as bordering *meritorious*. In sum, the indices suggest the use of factor analysis is an appropriate analysis technique for data examination.

Table 4.33: KMO and Bartlett's Test for SCIS

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.787
Bartlett's Test of Sphericity	Approx. Chi-Square	1035.735
	df	91
	Sig.	.000

Selection criteria are the attributes influencing undergraduate students' search process in the choice of programs, disciplines and educational institutions. Broekemier (2002) states for traditional aged undergraduate students the choice criteria that consistently rated as important included: programs of study, cost, financial aid scholarships, job placement after graduation, safety and facility quality excellent teachers, area of study, academic reputation, cost and teach availability, and quality of faculty, degree programs, cost (tuition and fees) variety of offerings and classroom instruction.

4.12.1 Factor Extraction

An approximate initial solution was obtained using the Principal Components Analysis. This solution was then rotated using the orthogonal rotation algorithm Varimax. Before extraction, 14 linear components have been identified within the data set. Four factors met the criterion of recording an eigenvalue of 1 or more (3.866, 1.512, 1.322, and 1.229). If the four values are extracted, then this would explain 58% of the variance. Inspection of the rotated component matrix identified item (f) *Type of University* (factor loadings of .253; .284; .436 and .280) not meeting the decisional rules of a factor loading of at least 0.50. The item was removed and the analysis was rerun.

A four factor output for the MIS scale explained 60% of the variances in the variables for thirteen items. The highest factor loading for each item against the two factors is underlined in Table 4.34 When more than two items were loaded to the same extracted factors, the internal consistency of these items was tested with Cronbach's α. However, when only two

items loaded to the same factor, Pearson correlation is reported (Veloutsou et al. 2004). All the constructs developed had α reliability coefficients of Factor 1 (.770), Factor 2 (.657), Factor 3 .523) which is higher than the threshold level of 0.50 suggested sufficient for exploratory research work (Nunnally 1994). For Factor 4, Pearson correlation is .292[5] (refer to Table 4.39).

Table 4.34: Rotated Component Matrix (a) for SCIS

	Component			
Selection Criteria	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**
a. Reputation	**.783**	-.013	.156	.208
b. Cou.suitability	**.541**	.048	.381	-.314
c. Entry	.213	-.036	**.741**	.059
d. Ran .courses	.280	.417	**.503**	-.155
e. Cost	-.074	**.576**	.349	.195
g. Famopport.	-.001	.000	.263	**.772**
h. Location	-.092	.155	**.577**	.269
i. Resources	.077	**.776**	.274	-.065
j. Facilities	.098	**.693**	-.121	.353
k. Jobopportun.	.206	.185	-.021	**.606**
l. Teachquality	.382	**.716**	-.100	.026
m. Prog.reput.	**.801**	.245	.013	-.047
n. Status.prestig	**.721**	.173	-.003	.403

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 7 iterations.

Table 4.34 indicates the selection criteria items which have high loadings on Factor 1 are (a) *University reputation;* (b) *Course suitability;* (m) *Program reputation;* and (n) *Prestige and status of the university.* Items (a), (b), (m) and (n) reflect the influence of reputation on both a university and program level. High loadings for three of the four items suggest the items relate to the reputation influence they were designed for. Therefore Factor 1 is termed *Reputation influence*. Factor 1 equates to Veloutsou et al. (2004) *factor 7* labelled *University's reputation* which consisted of two highly loading items of 'Department's Reputation' and 'University's Reputation' of the nine factor solution describing specific information requirements for students when selecting universities.

[5] ** Correlation is significant at the 0.01 level (2-tailed).

Selection criteria items which have high loadings on Factor 2 are (e) *Cost of fees*; (i) *University's resources*; (j) *Recreation and the facilities;* (l) *Teaching staff experience and qualifications.* These items were designed to measure the influence of *academic resources and services* (Gray et al. 2003; Joseph and Joseph 2000; James, Baldwin and McInnis 1999). Therefore Factor 2 is termed *Academic Resource Influence.*

Selection criteria items which have high loadings on Factor 3 are (c) *Entry requirements* (d) *Range of courses available* and (h) *Location of the university* designed to measure entry influences into a degree program and choice of university. The only item that was not included in this factor was (f) *University type* Therefore Factor 3 is termed *Entry Influences*

Selection criteria items which have high loadings on Factor 4 are (g) *Family opinion;* and (k) *Job opportunities after graduation.* Both of the items relate to influences external to the degree program and university selection. Chapman (1981) identified 'significant persons' as one of the external influences affecting a student's college choice. Joseph and Joseph (1998) also identified 'Peer and family influence' as a proposed five factor model representing the most important factors students take into consideration for further studies**.** Furthermore, Soutar and Turner (2002) used the attribute of 'Family Opinion', defining this item as 'what their family thinks about each university (whether it is held in good or poor esteem)'. Therefore Factor 4 is termed *External Influences.*

4.12.2 Summary of Factors for SCIS Scale

The fourteen items on the SCIS scale were hypothesised to measure the importance respondents allocate to particular attributes and the relationship of those attributes to the selection of a particular degree program and university. Analogous to past research on undergraduate selection criteria (Veloutsou et al. 2004; Moogan and Baron 2003; Soutar and Turner 2002; Broekemier 2002; Joseph and Joseph 2000), a four factor solution was verified when all items (with the exception of (f) university type) were included in dimensions of Reputation; Academic resources, Entry and External influences.

4.13 Summary of Descriptive Statistics

The descriptive analysis facilitated an in depth profiling of students both as an undergraduate cohort and by portfolio. Table 4.35 depicts the demographic and socioeconomic variables found to be influential upon determining a student's preference set. In terms of preferences pertaining to selecting an academic program, discipline and university, Table 4.36 outlines the order deemed most relevant by portfolio. The three cohorts considered the academic program and choice of university before considering the discipline. In other words, a student enrolled in Business considered the university he/she wanted to apply to first, then the degree program offered at that university. Unlike Business, students enrolled in both SET and DSC reported the degree program as their first consideration, then the university offering such a degree program.

Table 4.35: Demographic/ Socioeconomic Variables by Portfolio

Portfolio	**Business**	**DSC**	**SET**
Gender	Female	Female	Male
Age Aggregate	17- 20	21- 27	17- 20
Country of Birth	Australia	Australia	Australia
Occupation- Father	Professional	Professional	Professional
Occupation- Mother	Working	Professional	Working
Education – Father	University	University	At least High School
Education – Mother	At least High School	University	At least High School
Combined Income	$80 000 - $90 000	$80 000 - $90 000	$ 50 000 - $79 000

Table 4.36: Preferences for University Program and Discipline by Portfolio

Portfolio	**Business**	**DSC**	**SET**
First Consideration	University	Program	Program
Preferences	Yes	Yes	Yes
University Consideration	RMIT (56%)	RMIT (85%)	RMIT (56%)
Preferences	Yes	Yes	Yes

Psychological profiles facilitated an understanding of the most important constructs for each cohort. Table 4.37 provides an overview of the most important constructs driving choice behaviour. Internal values were considered of utmost importance by all undergraduate students. In terms of motivation and selection criteria, similarities were evident for students enrolled in Business and SET. Both cohorts were extrinsically driven in pursuing a vocational outcome. In contrast, students enrolled in DSC indicated an intrinsic orientation towards pursuing higher education, influenced strongly by the suitability of the degree program.

Table 4.37: Psychological Constructs by Portfolio

Portfolio	**Business**	**DSC**	**SET**
Personal Values	*Internal* *S*ense of Accomplishment	*Internal:* Self Fulfilment	*Internal :* Sense of Accomplishment
Motivation	*Extrinsic* "A degree will enable me to get to prestigious job	*Intrinsic* "I want to become a better educated"	*Extrinsi*c "Gaining a degree will allow me to gain more money"
Selection Criteria	*External Influence* "Job Opportunities"	*Reputation Influence* "Course Suitability"	*External Influence* "Job Opportunities"

4.14 Summary of Exploratory Factor Analysis

Exploratory factor analysis (EFA) with orthogonal rotation was used to examine the properties of the three scales; PVIS, MIS and SCIS. Based on the premise underlying patterns of relationships exist amongst the variables, a number of factors were postulated to account for existing correlations. Using the latent root criterion to extract significant factor scores within each dimension, nine factor scores with eigenvalues greater than one were presented as substitutes for the original surveyed items. The analysis clearly suggested the nine LOV *values* were well represented by two factors Factor 1: Internal values; and Factor 2: External Values, the *motivation* construct by three factors of; Factor 1: Extrinsic Motivation; Factor 2: Amotivation; and Factor 3: Intrinsic Motivation; and *selection criteria* by a four factors of Factor 1: Reputation Influence; Factor 2: Academic Resource Influence; Factor 3: Entry Influence and Factor 4: External influence. Bartlett's sphericity

tests were significant (p= .000), (refer to Table 4.38) suggesting there are some relationships between the variables. Kaiser-Meyer-Olkin tests, an assessment of partial correlations between variables were greater than the suggested minimum value of .7 (Hair et al. 1998).

Table 4.38: Overview of KMO and Bartlett's Test for PVIS, MIS, and SCIS

		PERSONAL VALUES	MOTIVATION	SELECTION CRITERIA
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.845	.789	.766
Bartlett's Test of Sphericity	Approx. Chi-Square	1240.265	1180.502	807.732
	df	36	78	55
	Sig.			.000

The dimensionality of constructs was investigated and verified though exploratory factor analysis. Construct validity was evaluated on internal consistency, by reporting Cronbach's alpha coefficient (refer to Table 4.39). When more than two items were loaded to the same factor, while only two items loaded to the same factor, Pearson correlation is reported (Veloutsou et al. 2004). The alpha values range from .657 to .849 exceeding on average the minimum hurdle of 0.7 (Hair et al. 1998).

Table 4.39: An Overview of Extracted Components for PVIS, MIS and SCIS

Extracted Components				
Factors	**Eigen values**	**% of Variance**	**Cumulative Variance**	**Alpha**
PERSONAL VALUES				
Factor 1: Internal (Va) (Vb) (Vc) (Vh) (Vi)	4.555	35.0	35.0	.849
Factor 2 : External (Vd); (Vg); (Ve) ;(Vf):	1.247	28.3	**63.3**	.792
MOTIVATION				

Factor 1: Extrinsic (a) (g) (j)(k) (m)	3.995	20.5	20.5	.814
Factor 2: Amotivational (d), (h), (n), (p), (l) (e)	2.484	17.7	38.0	.735
Factor 3 :Intrinsic (b), (f), (q) (c)	1.733	16.6	**54.5**	.704
SELECTION CRITERIA				
Factor 1:Recognition (a) (b) (m), (n)	3.639	18.5	18.5	.770
Factor 2: Academic (e), (i) (j) (l)	1.556	17.3	33.8	.657
Factor 3: Entry (c) (d), (h)	1.324	12.2	48.1	*354
Factor 4: External (g), (k)	1.275	11.8	**60.1**	**254

*Pearson correlation
** Correlation is significant at the 0.01 level (2-tailed).

4.14.1 Personal Values Influence Scale

The PVIS was designed to investigate the role and influence of personal values as a driver of student's choice behaviour when selecting a preferred degree program, discipline and university once a decision was made to enter higher education. Nine values adopted from the LOV scale formed the basis of the PVIS. Each value was represented by five parenthetical statements (refer to Section 3.3) constructed to accurately measure each theoretical latent construct. The analysis clearly suggested the nine LOV values were well represented by two factors Factor 1: Internal values, and Factor 2: External Values.

4.14.2 Motivation Influence Scale

The MIS was designed to investigate the role and influence of motivation as a driver of a student's choice behaviour when selecting a preferred degree program, discipline and university once a decision was made to enter higher education. Seventeen items relating to Vallerand et al. (1992) *Academic Motivation Scale* (AMS*)* were constructed to measure extrinsic motivation, intrinsic motivation and amotivation. Consequently, three factor score requested are Factor 1: Extrinsic Motivation; Factor 2: Amotivation; and Factor 3: Intrinsic Motivation.

4.14.3 Selection Criteria Influence Scale

The SCIS was designed to investigate the role and influence of selection criteria as a driver of student's choice behaviour when selecting a preferred degree program, discipline and university once a decision was made to enter higher education. The analysis suggested the thirteen items were well represented by a four factor output of Factor 1: Reputation Influence, Factor 2: Academic Resource Influence, Factor 3: Entry Influence and Factor 4: External influence.

The results of the EFA analyses identified overall nine significant factors. As at least two significant loadings for any one factor were loaded, this decreased the likelihood of losing information in measuring the three constructs of personal values, motivation and selection criteria (Yoon and Usyal 2003). The derived factor scores generated from the EFA were used as composites and factor regression scores for the construction of a structural equation model and multinomial linear regression respectively. The next two chapters will detail the data analysis of the methodologies.

Chapter 5

STRUCTURAL EQUATION MODELING

5.1 Introduction

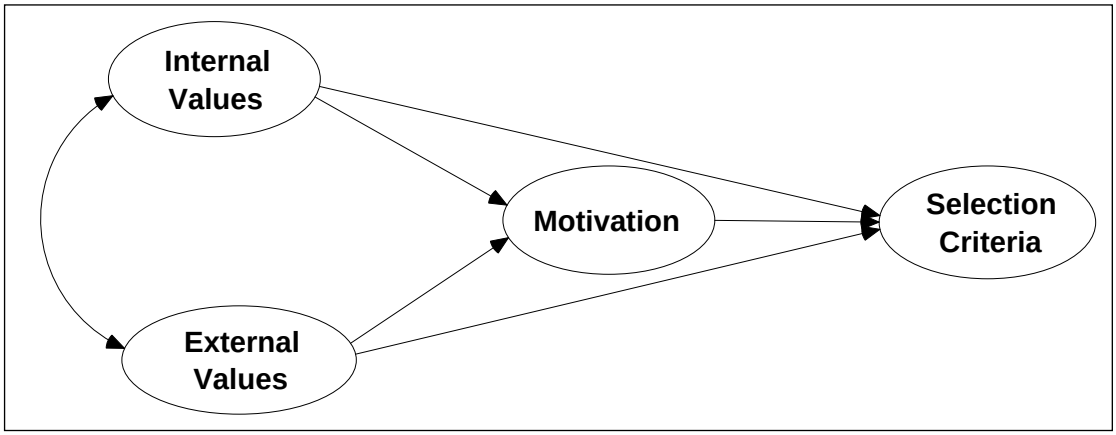
This chapter reports on the second stage of the analysis. Chapter four assessed how representative the sample was with respect to preferences of particular programs, disciplines and university. A profile of respondents in terms of the importance allocated to the three psychological constructs of personal values, motivation and selection criteria were examined. Furthermore, the psychometric properties of the three scales Personal Values Influence Scale (PVIS), Motivation Influence Scale (MIS) and Selection Criteria Influence Scale (SCIS) were also examined, establishing the domain of the theoretical constructs and their indicators. Using a multinomial logistic regression model, chapter six will present and discuss the results of a discrete student choice model.

This chapter discusses the development of a strategy for structural equation modeling. The underlying objective was to establish a plausible model for understanding the importance students attach to the three psychological constructs of personal values, motivation and selection criteria. The outcome of this chapter proposes significant pathways amongst the independent construct of personal values, motivation and selection criteria.

5.2 Proposed Hypothetical Model

Figure 5.1 depicts the hypothesised pathways of a schematic representation of a conceptual model of first year undergraduate students' behaviour. This model is operationalised in Figure 5.2. Components of the model emanate from literature reviews in the discipline areas of consumer behaviour, education, marketing and psychology disciplines suggesting choice behaviour is a multidimensional construct.

Figure 5.1: The Proposed Hypothetical Model



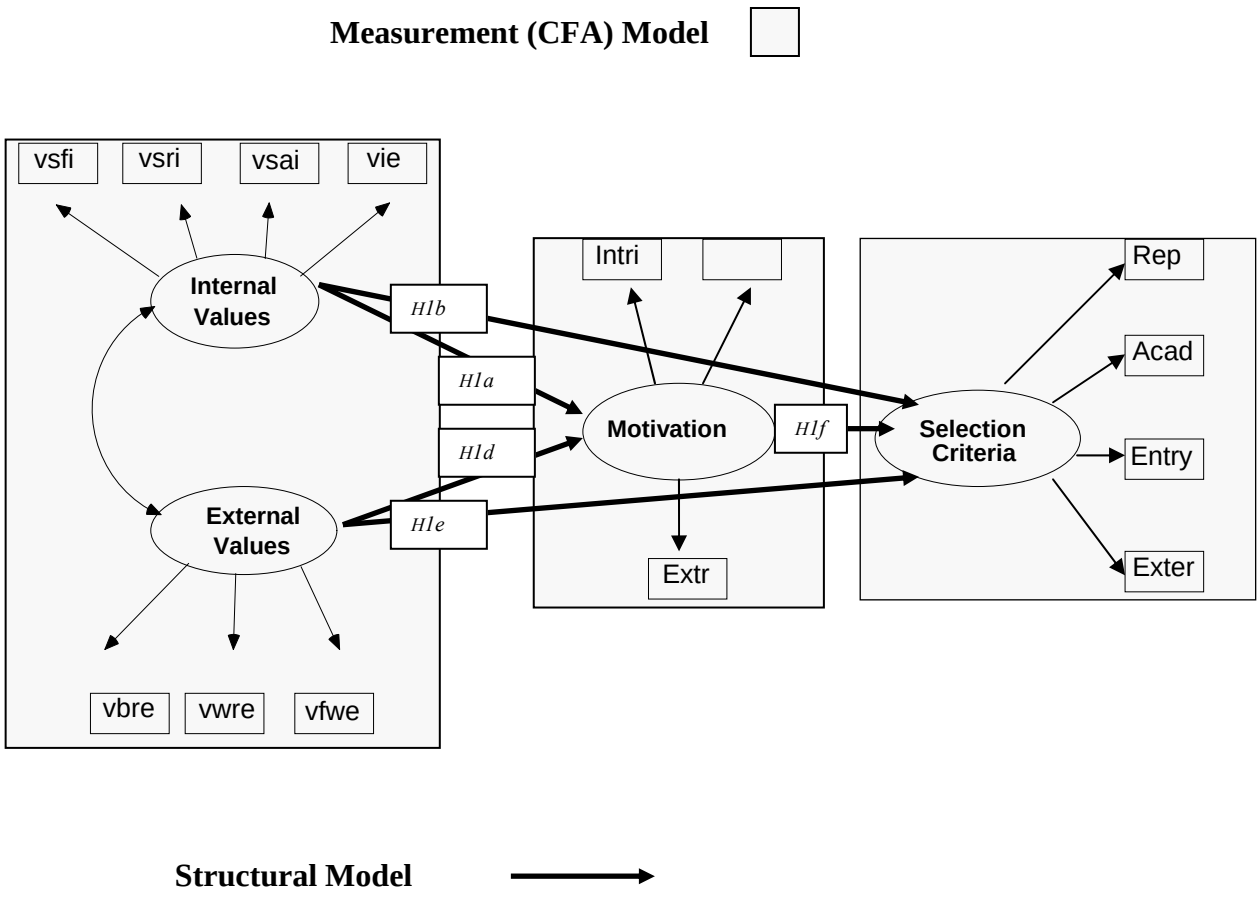
In broad terms, the proposed model indicates values influence the level of importance students allocate to their level of motivation and to various selection criteria. This is hypothesised through both direct and indirect effects of 'constructs' such as values (Jayawardhena 2004; Shim and Eastlick 1998; Homer and Kahle 1988), upon motivation (Byrne and Flood 2005; Bennett 2004; Bogler and Somech 2002; Fazey and Fazey 2001; Vallerand et al. 1992) and selection criteria (Veloutsou et al. 2004; Gray et al. 2003; Soutar and Turner 2002; Joseph and Joseph 2000; O'Brien and Deans 1996). The main constructs relevant to the development of a structural equation model are personal values, motivation and selection criteria.

5.2.1 The Structural Equation Model

As discussed in Chapter three, the general SEM model can be decomposed into two submodels: a measurement model and a structural model (refer to Figure 5.2). A

measurement model relates the constructs to their measures and the structural model relates the constructs to each other (Jarvis et al. 2003). The structural model presented in Figure 5.2 represents a *two* factor output for the exogenous latent variables of personal values, *internal* (i), of self fulfilment (vsfi), self respect (vsri), sense of accomplishment (vsai), excitement (vei) and *external* (e) values of being well respected (vbre), sense of belonging (vsbe), warm relationships with others (vwre). A three factor output is depicted for motivation, *intrinsic,* (intri), *extrinsic* (extr) and *amotivational* (amot) and a four factor output for selection criteria: *reputation* (rep), *academic* (acad) *entry and external influence* (exter). The four factors in circles represent latent variables and the fourteen rectangles represent measured variable.

Figure 5.2: Structural Equation Model



Based on psychological constructs identified in the literature review of Chapter two, the three general hypotheses proposed were restated as;

H1a: There is a direct and positive relationship between internal values and motivation.

H1b: There is a direct and positive relationship between internal values and selection criteria.

H1c: That motivation will mediate the influence of values on selection criteria.

To investigate how the proposed constructs relate to each other, three additional hypotheses were formulated.

H1d: There is a direct and positive relationship between external values and motivation

H1e: There is a direct and positive relationship between external values and selection criteria

H1f: There is a direct and positive relationship between motivation and selection criteria

5.3 Measurement Model Specification

As discussed in Chapter three, this thesis adopted the recommended two step model building approach (Anderson and Gerbing 1988) by starting with validating and confirming an initial measurement model and then examining the proposed pathways through the structural model (Chitty et al. 2007; Yoon and Usyal 2005; Jayawardhena 2004; Homer and Kahle 1988). The first step of the analysis involved specifying the measurement model and the relationships between the observed variables (items) and latent variables or hypothetical constructs (factors). This included assessing the measurement properties (reliabilities and validities) of the observed and latent variables. Importantly, specifying a measurement model facilitates a confirmatory assessment of convergent and discriminate validity (Anderson and Gerbing 1988). The second phase of the analysis involved assessing the structural model and the hypothesised relationships amongst the latent variables

depicted in Figure 5.2. This theoretical model was then tested and revised until a theoretically meaningful and statistically acceptable model was found (Cox et al. 2006).

5.4 Results for the Measurement Models: One factor Congeneric Models

The following section presents the iterative process of previewing the measurement models in terms of possible model misspecification and in terms of their 'goodness of fit' to the data. This approach of diagnosing and implementing changes suggested by test results in this manner can be considered as post- hoc (Golob 2003). A model is correctly specified when it reproduces the sample covariance matrix well. Inspecting residuals and modification indices are an appropriate approach of locating model misspecification (Byrne 2001). All items relating to each of the latent constructs of interest, personal values, and motivation and selection criteria were also examined for possible cross loadings and redundant items suggestive of lack of fit (Chitty et al. 2007). Redundant items for example could occur when different questions/items in essence ask the same question.

5.4.1 Personal Values

One-factor congeneric models were established for each of the nine personal values. This entailed assessing each of the five parenthetical statements representing measures of individual latent values. As a result of the review process of model specification and 'goodness of fit measures', of the forty five items representing the nine LOV values, thirty seven items were retained. Value (g) 'Being Well Respected' was the only value to retain all five statements as measurement items. All of the other values retained four of their five value statements (refer to Table 5.1).

The eight values are discussed below;

1. A review of MI for each of the five item's regression weights and covariances for value (a) of 'Self Fulfilment' led to the removal of item (1) *I feel happy with what I have* resulting to a better fitting model from (χ^2 (5) 47.64 p=*.000*) ***to*** (χ^2 (2) 6.9 p=*.030*). It appears the attribute stated in the item (1) of happiness did not necessarily equate with a sense of fulfilment.

2. A review of MI for each of the five item's regression weights and covariances for value (b) of 'Self Respect', led to the removal of item (5) *Being worthy, confident and proud are beliefs that are very important to me* resulting to a better fitting model from (χ^2 (5) 43.7 p=*.000*) ***to*** (χ^2 (2) 2.05 p=.358). It appears, the attribute stated in the item (5) was not thought of by the sample as reflective of the value 'Self Respect'.

3. A review of MI for each of the five item's regression weights and covariances for value (c) of 'Sense of Accomplishment' led to the removal of item (4) *I gain internal satisfaction for doing something right* resulting to a better fitting model (χ^2 (5) 37.61 p=*.000*) ***to*** (χ^2 (2) 4.7 p=*.095*). It appears accomplishment is interpreted more in terms of 'successes' than satisfaction.

4. A review of MI for each of the five item's regression weights and covariances for value (d) of 'Security' led to the removal of item (4) *To be protected by someone or something is important to me* resulting to a better fitting model (χ^2 (5) 42.5 p=*.000*) ***to*** (χ^2 (2) 6.0 p=*.049*). Item (4) was in essence very similar to item (3) *To feel safe, protected and secure is important in my life* as both items dealt with issues of protection.

5. A review of MI for each of the five item's regression weights and covariances for value (e) 'Sense of Belonging' indicates misspecification of item (3) *I always seek to be part of the community*, and item (4) *It is very important for me to fit in with a group of similar people* (MI = 8.327) indicating possible item redundancy between the two questions. A closer inspection of both questions designed to measure the value of (e) 'Sense of Belonging' suggests a high degree of overlap in item content, in that both questions appeared to be measuring an individual's sense of fitting into a community. Removal of item 4 of (e) 'Sense of Belonging' resulted in a better model fit with the data (χ^2 (5) = 46 *p* = .00) ***to*** (χ^2 (2) 4.5 p=.105.

6. A review of MI for each of the five item's regression weights and covariances for value (f) of 'Warm Relationships' led to the removal of item (4) *Being socially connected with others is important to me* resulting to a better fitting model (χ^2 (5) 61.2 p=*.000*) ***to*** (χ^2 (2) 6.9 p=*.061*). It appears, the attribute stated in the item (4) was not thought of by the sample as reflective of the value 'Warm Relationships'.

7. A review of MI for each of the five item's regression weights and covariances for value (h) of 'Fun and Enjoyment' led to the removal of item (5) *I always seek to have a great time in whatever I choose to do* resulting to a better fitting model (χ^2 (5) 36.3 p=*.000*) ***to*** (χ^2 (2) 6.9 p=*.032*). It appears, the attribute stated in the item (5) was not thought of by the sample as reflective of the value 'Fun and Enjoyment'.

8. A review of MI for each of the five item's regression weights and covariances for value (i) of 'Excitement ' led to the removal of item (1) *I always enjoy the thrill and risk of breathtaking activities* resulting to a better fitting model (χ^2 (5) 31.4 p=*.000*) ***to*** (χ^2 (2) 1.3 p=*.508*). It appears the attribute stated in the item (1) did not necessarily equate with the value of excitement.

Table 5.1: One- Factor Congeneric Fit Statistics Model Fit – Personal Values n=304

Scale	Fit statistics						
	(df)	**χ^2**	***p***	**RMSEA**	**GFI**	**TLI**	**AGFI**
Value (a) Self fulfilment 1*.I feel happy with what I have 2. Being well balanced , content and at one with the world is important to me 3. One should work hard always to achieve life goals that lead to self fulfilment 4. Gaining personal satisfaction through succeeding is important to me 5. Believing in myself is an important attribute to me	2	(6.9)	. 030	.060	989	.965	. 954
Value (b) Self respect 1. It is important to have a sense of dignity about myself 2. Not compromising myself is a valued attribute 3. It is important to stand up to what I believe in 4. I always maintain a set of actions that reflect positively on who I am 5* Being worthy, confident and proud are beliefs that are important to me	2	(2.0)	.358	.009	.983	.999	. 983

Value (c) Sense of accomplishment 1. Achieving a personal goal is important to me 2. I always try to complete successfully what I set out to do 3. I take pride in my efforts to complete a task 4.***** I gain internal satisfaction for doing something right 5 Finishing something makes me feel content and satisfied	2	(4.7)	.095	.067	.993	.980	.963
Value (d) Security 1. I always have faith that nothing will go wrong 2*****.To be protected by someone or something is important to me 3. To feel safe, protected and secure is important in my life 4. It is important to me to be mentally and emotionally stable 5. I always seek to feel comfortable in any situation	2	(6.0)	.049	.081	.990	.949	.981
Value (e) Sense of belonging **Retained Items: 1, 2, 3,5** 1. Feeling comfortable and "at ease" with my family and friends is important to me. 2. Accepted and included in my environment is important to me 3. It is very important to me to fit in with a group of similar people 4*****. I always seek to be part of a community 5. Being welcomed and accepted for who I am gives me a deep sense of belonging.	2	(4.5)	. 105	.064	. 992	.982	. 962
Value (f) Warm relationships 1*****.Being socially connected with others is important to me 2. I always seek interactions and connections that are mutually satisfying with others 3. It is very important to me to form bonds and ties with people 4. Building friendships, associations and networks is important to me 5. Contributing and learning from relationships is important to me	2	(6.9)	.032	.061	.989	.974	.943
Value (g)Being well respected 1. It is important to be admired by others 2. It is very important to me to have a good reputation 3. Other people's opinion and regard	5	(2.1)	.827	.000	.997	[6]1.01	.992

[6] Note- For these constructs# , the TLI suggests there may be some degree of óverfitting', however, TLI is usually interpreted within the range of 0 – 1.0.and a there is a recommendation of TLI≥.95 (See Hu and Bentler 1999)

of me is important 4. Being seen as a role model and looked upon by others is important to me 5. People who have expertise in some areas are well respected							
Value (h)Fun and enjoyment in life 1. Getting the most out of life is important to me 2. Doing things for myself which make me happy is important to me 3. It is important to me to be happy and know how to have a good time 4. Doing something I want to do is important to me 5***.** I always seek to have a great time in whatever I choose to do	2	(1.4)	.486	.000	.998	#1.00	.988
Value (i) Excitement 1*****. I always enjoy the thrill and risk of breathtaking activities 2. It is important to me to look forward to something 3. I always seek new experiences and possibilities 4. I always enjoy the anticipation of something new 5. I like to go to places that involve exciting activities	2	(1.3)	.508	.000	.998	# 1.00	. 989
Total of 37 retained from 45 items **** Deleted Items***							

5.4.2 Motivation

A one-factor congeneric model for intrinsic motivation reflected all four of the observed items of (b), (c), (f) and (q) (refer to the Extracted Components Table 4.39) measured this latent factor in a well fitted model (χ^2 (2) 3.1 p=.197). The model fit suggested the four observed variables were an appropriate measure of the intrinsic motivation construct (refer to Table 5.2).

However, for the extrinsic motivation, a one factor congeneric model indicated the specified items of (a), (g), (j), (k), and (m) did not fit the data well (χ^2 (5) 30.8 p=*.000*). Modification indices showed a high correlation between items (a) *A degree will enable me to get a prestigious job* and (g) *Gaining a degree will allow me to earn more money.* In other words, both items appeared to be measuring a similar content. Removal of item (g) resulted to a better fitting model (χ^2 (2) 2.2 p=.277).

The analysis of the 'amotivation' construct provides an illustration of model misspecification identified from standardised residuals. Items (d), (h), (n), (p), (i), (e) classified as 'amotivational' motivation to measure the single latent trait of 'amotivation' do not fit the data well (χ^2 (5) 44.7 p=*.000*). An inspection of the standardised residuals (2.248) shows the model is not accounting well for the association between the items (e) *I want to experience life as a university student* and item (n) *Attending the right institution expresses who I am* and the remaining items measuring amotivation. Item (e) was specified as an intrinsic motivation and should not be representative of amotivation. Conceptually, item (e) is opposed to an amotivation orientation; therefore removal of this item appears in theory justified. Item (n) was similar to item (p), *You can tell about a person from the institution they attend* in that both statements were measuring motivational reasons pertaining to perceptions of institutions. The problematic item of (n) and (e) were removed resulting to a better model fit to the data (χ^2 (2) 2.2 *p*=.021)

Table 5.2: One-Factor Congeneric Fit Statistics Model Fit –Motivation n=304

Scale	**Fit statistics**						
	χ^2	**(df)**	***p***	**RMSEA**	**GFI**	**TLI**	**AGFI**
Intrinsic motivation (4 items	3.1	(2)	.197	.000	.995	.985	.973
b. I want to become a better educated person							
f. I will enjoy the academic challenge							
c. The chance to meet and make new friends.							
q. I get a lot of enjoyment out of learning							
Extrinsic Motivation (4 items)	2.5	(2)	.277	.031	.996	.994	.980
a. A degree will enable me to get a prestigious job							
j. I need a degree to follow my career							
k. *A university degree is really important me*							
m. Getting a degree will allow me to get the job I want.							
Amotivation (4 items)	1.7	(2)	.424	.000	.997	1.00	.986
d. All my friends are going to uni.							
h. My parents want me to go to uni							
i. To show I can be successful at university							
p. You can tell about a person from the institution they attend							

5.4.3 Selection Criteria

A one-factor congeneric model indicated the specified items of (a), (b), (m) and (n) for 'reputation influence' and (l), (j), (e) and (i) for 'academic influence' fitted the data well (χ^2 (2) '3.2' p=.93) and (χ^2 (2) 1 p=.610) respectively. As for Factor three 'entry influence' and Factor four 'external influence', both factors did not comply with the requirement of containing at least three items per latent construct in order to fit a one-factor congeneric model. Therefore, both factors were run as a two factor model. The two factor model indicated an acceptable chi square fit statistic (χ^2(4) 8.6 p=.071).

Table 5.3: One-Factor Congeneric Fit Statistics Model Fit –Selection Criteria n=304

Scale	Fit statistics						
	χ^2	(df)	*p*	RMSEA	GFI	TLI	AGFI
Selection criteria – Reputation	3.2	(2)	.93	.046	.995	.986	.973
a. University reputation							
b. Course suitability							
m. Programme reputation							
n. Prestige and status of university							
Academic Influence	1	(2)	.610	.000	.998	1.01	.992
l. Teaching Qualification.							
j. Recreation and facilities							
e. Cost of fees							
i. University resources							
****Entry Influence**							
c. Entry requirements							
d. Range of courses							
h. Location							
****External Influence**							
k. Job opportunities							
g. Family Opinion							
****2 factor model**	1	(1)	.310	.010	.998	.997	.983

5.5 Multi Factor Models of the Three Constructs

5.5.1 Personal Values

A two-factor model (Figure 6.3) including all items for Internal and External constructs did not initially fit the data well ($\chi^2(26)$ 124.2 p=.000). Two underlying causes of discrepancy were identified. The first occurred between values (h) 'Fun and Enjoyment' and (i) 'Excitement' as evident from misspecification indicators (standardised residual = 4.400 and MI= 28.829). This suggests the model is not accounting well for the covariation that exists between these two values. From the perspective of the respondent, there appeared to be little differentiation between these two values and one could in essence substitute "Fun and Enjoyment' for 'Excitement'.

Further inspection of indices showed the second misspecification occurring between value (d) 'Security' and value (c) 'Sense of Accomplishment' (standardised residual = 2.476).

The options available based on the indicators were to:

- Covary the error terms, however this may compromise unidimensionality
- Drop one or both of the values
- Re specify the model with three factors than two factors; however the given eigenvalue would need to be considered

Given these options, a subsequent two-factor model with the deletion of value (c) and value (d) showed to be a better fitting one as noted by the drop in RMSEA .112 to .044. Values of less than .05 indicate a good fit (Helgesen and Nesset 2007)

Figure 5.3: Multi Factor Models -Values

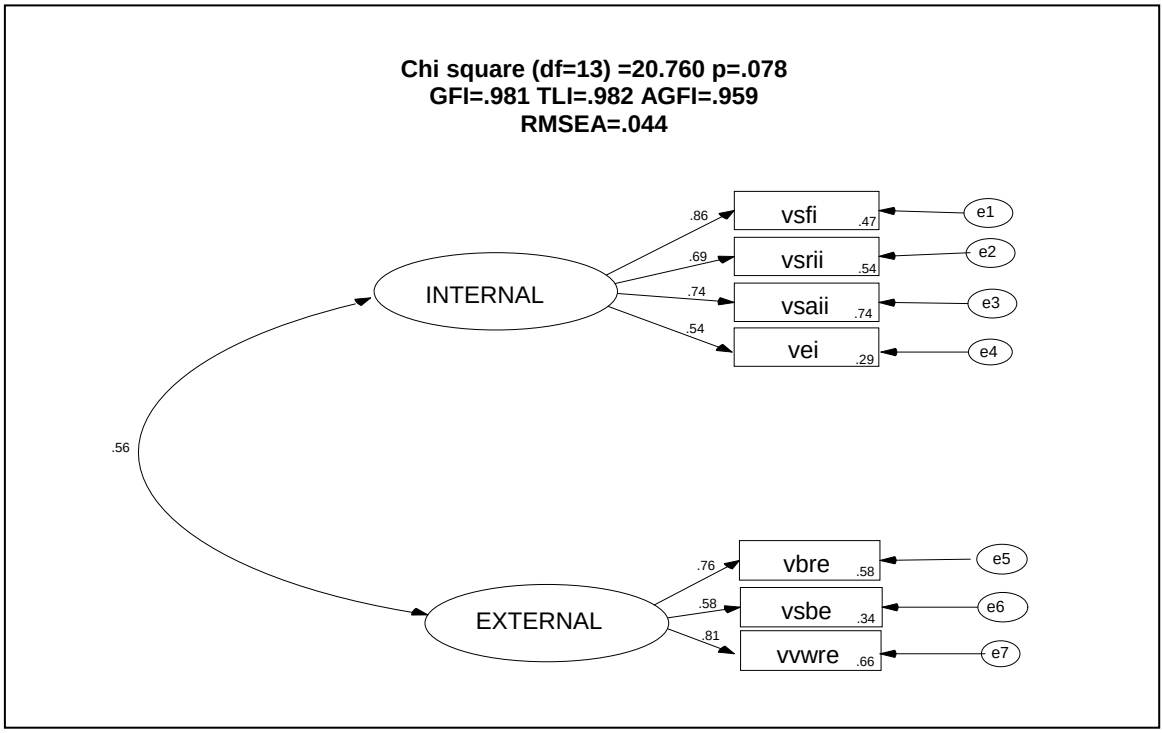


Table 5.4: Multi Factor Models- Values

Scale	**Fit Statistics**						
	χ^2	**(df)**	***p***	**RMSEA**	**GFI**	**TLI**	**AGFI**
*****Value (h) Fun and enjoyment in life***							
*****Value (d) Security***							
CFA: Two factor Model -Values	20.7	(13)	.078	.044	.981	.982	.954
****Items Removed**							

5.5.2 Motivation

A three-factor model for motivation did not fit the data well (χ^2 (51) 209.5 p=.000). The construct of amotivation appeared to be somewhat problematic presenting with very large standardised residuals values ranging from 3.470 to 4.011. Items (d) *All my friends are going to university,* (h) *My parents want me to go to university, and* (i) *To show I can be successful at university* representing the amotivational construct appeared to be measuring

similar properties as the extrinsic items of (a); *A degree will allow me to get a prestigious job*; (j) *I need a degree to follow my career* and (m) *Getting a degree will allow me to get the job I want*. The remaining amotivational item (p); *You can tell about a person from the institution they attend* suggested being a better representative of an extrinsic motivation.

In fact item (p) was more reflective of external regulation, a clear subcategory of extrinsic motivation rather than an amotivational value. External regulation exists when the reasons for acting are stimulated and controlled by influences external to the task and the individual. Consequently, a student who is studying in order to achieve perceived social status and who is not interested in the degree per se would score high on external regulation (Fazey and Fazey 2001). Motivation (p) was therefore included as one of the items measuring 'extrinsic' motivation.

An inspection of the standardised residuals (2.217) also showed the motivation (c) *The chance to meet and make new friends* was not accounting well for the association between this item and the remaining intrinsic motivation (b), (f) and (q). Removal of this item as an extrinsic motivation to measure an intrinsic orientation appeared theoretically justified.

Although the [7]*p* value is still significant, in summary, the model fit (Figure 5.4) was substantially improved by excluding the 'amotivation' construct (χ^2 (8) 120, p=.000) as noted by the drop in RMSEA .083 to .058. The specification of a two factor measurement model suggested being more appropriate to measure the latent construct of motivation given the data.

[7] . A bootstrap modification of model chi-square,(Bollen-stine *p*) may be considered to improve *p* value however requires moderately large samples (Byrnes 2001 , p 271)

Figure 5.4: Multi Factor Models – Motivation

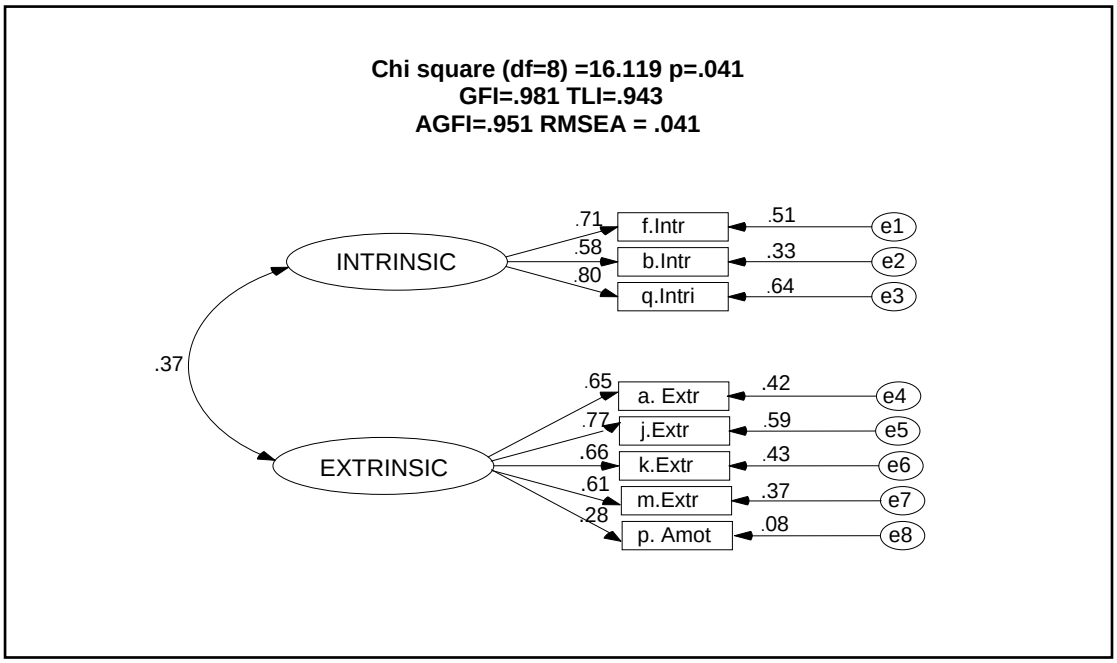


Table 5.5: Multi Factor Models- Motivation

Scale	Fit statistics						
	χ^2	(df)	*p*	RMSEA	GFI	TLI	AGFI
Amotivation (4 items)	1.7	(2)	.424	.000	.997	# 1.00	.986
***d. All my friends are going to uni.**							
***h. My parents want me to go to uni**							
***i. To show I can be successful at university**							
p. You can tell about a person from the institution they attend							
CFA Two factor Model- Motivation	8	(16)	.041	.058	.981	.943	.951

**** Bolded Items removed**

#TLI- See page 164

5.5.3 Selection Criteria

The results of a four factor model indicated a poor fit to the data (χ^2 = (59) 232 5 *p*= .000). An inspection of residual values suggested several items indicated model misspecification and suggestive of a lack of fit. Items (m) *Program Reputation* and item (l) *Teaching Qualifications* (residual of 3.373) appeared to be measuring similar properties or more specifically that the item of teaching qualifications constituted part of the 'reputation' of a program. Similarly, item (j) *Recreation and other Facilities* (3.180) appeared to also constitute part of item (n) *Prestige and Status of the University.* Another set of items indicating misfit was between item (g) *Family Opinion* and item (h) *Location* (residual of 3.487). *Location* was also poorly accounted for in terms of its correlation to the factor of 'Entry Influence' (.081). A four factor model was respecified with the subsequent removal of items (m), (l), (j) and (h) (χ^2 = (21) 55 *p*= .000). Although the chi square was significant, the drop in RMSEA of .098 to 0.73 resulted to a better fitting model.

Figure 5.5: Multi Factor Models - Selection Criteria

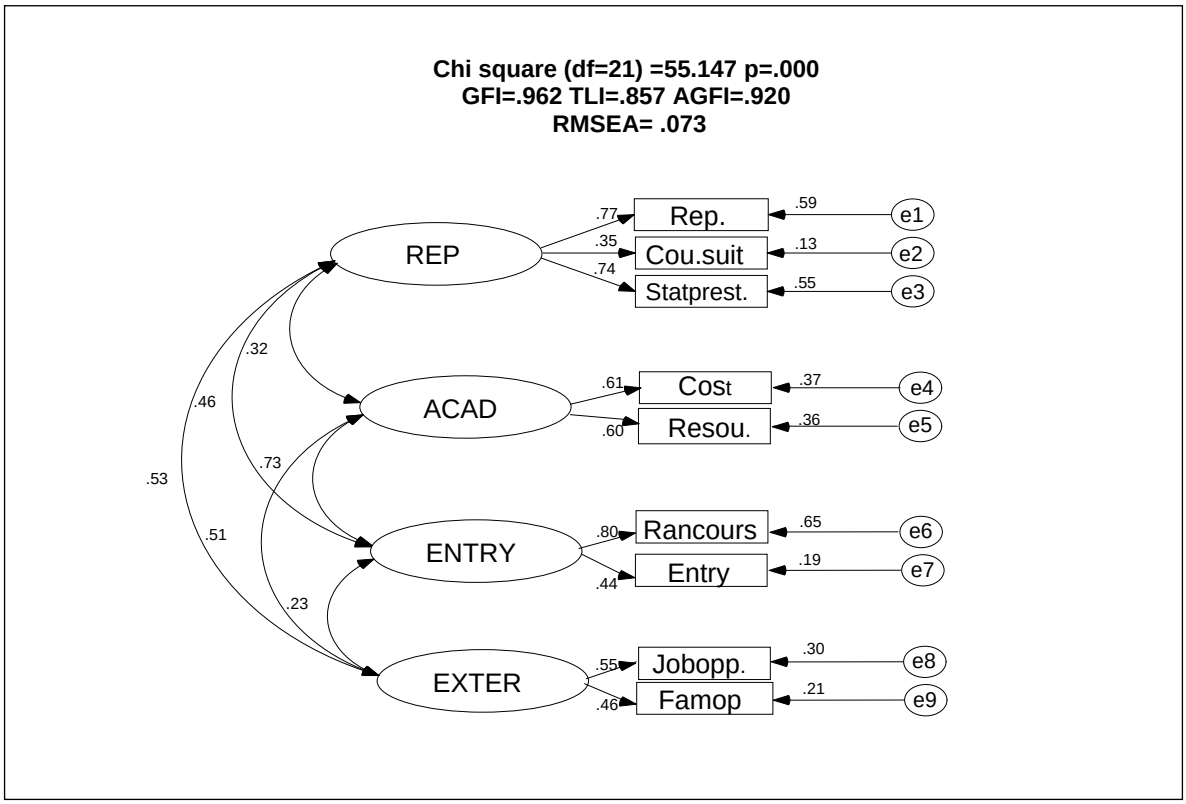


Table 5.6: Multi Factor Models- Selection Criteria

Scale	Fit statistics						
	χ^2	(df)	*p*	RMSEA	GFI	TLI	AGFI
Selection criteria – Reputation	3.2	(2)	.93	.046	.995	.986	.973
a. University reputation							
b. Course suitability							
***m. Programme reputation**							
n. Prestige and status of university							
Academic Influence	1	(2)	.610	.000	.998	# 1.01	.992
***l. Teaching Quals.**							
***j. Recreation and facilities**							
e. Cost of fees							
i. University resources							
Entry Influence	1	(1)	.310	.010	.998	.997	.983
c. Entry requirements							
d. Range of courses							
***h. Location**							
External Influence							
k. Job opportunities							
g. Family Opinion							
2 factor model							
Four factor Mode l- SC	55	(21)	.000	073	.962	.857	.920
** Bolded Items removed #TLI Refer to p.164							

5.6 Reliability and Validity

Although considered closely related conditions, reliability and validity are separate concepts. Reliability can be considered the degree to which a set of latent construct indicators are consistent in their measurements. Validity refers to the extent to which the indicators measure what they are supposed to measure (Bollen and Long 1993). Thus a measure may be consistent (reliable) but not accurate (valid). To assess both reliability and validity of the measurement models, for reliability measure, the squared multiple correlations for the observed variables was reported. The reliability estimates of the one factor congeneric models were verified using the Cronbach's alpha to assess internal consistency. The alpha values ranged from .654 to .865, meeting on average the minimum hurdle of .7. suggested by Hair et al. (1998). Two validity measures will be reported (1) convergent validity and (2) discriminant validity.

5.6.1 Reliability

The squared multiple correlation measures the correlation between a single indicator variable and the construct. A squared multiple correlations exceeding .50 is considered a good observed variable, however 0.30 is considered reflecting an acceptable indicator variable (Bollen 1989). The reliability measures are given in Figures 6.3 to 6.5. Of the single indicator variables across the measurement models, the most problematic was motivation (p) *You can tell about a person from the institution they attend*. With a squared multiple correlation of .077, this variable is poorly accounted. However the inclusion of this indicator as a representative of extrinsic motivation is supported as evident with the drop in a RMSEA of .081 to .058.

5.6.2 Construct validity

Construct validity assesses whether a measure relates to other observed variables in such a way that is consistent with theoretically derived predictions (Bollen 1989). Construct validity comprises of convergent and discriminant validity. Construct reliability, by convention, should be at least .70 for the factor loadings.

Convergent validity, a type of construct validity can be assessed by determining whether each indicator's estimated coefficients underlying construct is significant (Anderson and Gerbing 1988). It is the factor loadings that indicate the degree to which an observed variable is effectual in measuring a latent construct. The critical ratio of the parameter estimates can be used to test significance. Standardised loading factors greater than 0.5 (Steenkamp and Van Trijp 1991) are usually recommended. All the items across the factor models were adequate in displaying these properties ranging from 0. 30 to 0.96 (refer to Figures 6.3 to 6.5) and were all significant at the 0.01 level. These results show convergent validity was supported by the data for this thesis.

Discriminant validity refers to the distinctiveness of the factors measured by different sets of observed variables (Webster and Fisher 2001, p.14). This measure can be supported if the estimated correlations between the factors are not excessively high. Highly correlated indicators for particular constructs may imply a definitional overlap between constructs.

Discriminant validity of the measurement models was assessed via a chi square difference test on the values obtained for constrained (correlation equals unity) and unconstrained model (freeing the constraints) for two estimated constructs at a time (Anderson and Gerber 1988). A significant difference in the chi-square difference test facilitates an implication the constructs under testing do differ. Furthermore, a significantly lower chi-square value for the model in which the trait correlations are not constrained to unity would indicate that the traits are not perfectly correlated and that there is an indication of discriminant validity (Bagozzi, Youjae and Philips 1982). The main constructs of personal values, motivation and selection criteria were assessed for discriminant validity. Significant changes were observed between all models in the chi square test (refer to Table 6.7). In all cases, the constrained model was significantly worse fitting than the unconstrained model therefore implying distinctiveness between the two constructs. Furthermore, a significantly lower χ^2 value for the unconstrained model suggested the traits were not perfectly correlated and therefore may be considered as distinct concepts (Helgesen and Nesset 2007).

Table 5.7: Discriminant Validity

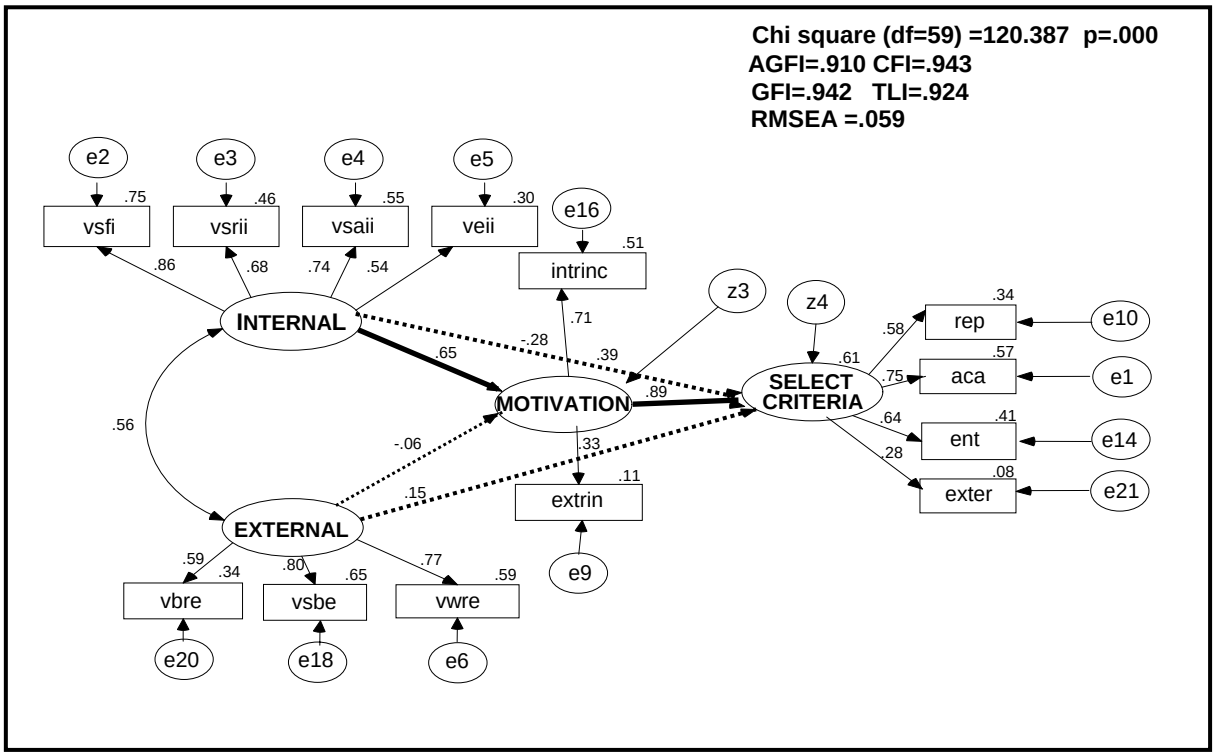
Constructs	**Constrained χ^2 value**	**Unconstrained χ^2 value**	**Chi square differences test**
Internal Values and External Values	df(14)65.1	df(13)20.8	**df(1)44.3***
Personal Values and Motivation	df(26)93.1	df(25)49.1	**df(1)44.1***
Personal Values and Selection Criteria	df(43)128.9	df(42)84	**df(1)44.9***
Motivation and Selection Criteria	df(9)54.9	df(8)11.3	**df(1)43.6***
*** All values significant at the 0.01 level**			

5.7 Structural Model

Leading on from the specification and establishment of measurement models, the hypothesised pathways between the independent variables of personal values, motivation and selection criteria were evaluated through structural equation modeling. For the analysis of both the paths between observed variables and the proposed relationships between the latent variables, this section develops and depicts two structural models, an initial

specification of the structural model; the full structural model and a final structural model. The full structural model in Figure 5.6 shows both significant and non-significant pathways. The final structural model depicted in Figure 5.12 is constructed through hypothesis testing and discussed in sections 5.9 and 5.10.

Figure 5.6: The Full Structural Equation Model



Non-significant pathway

Significant pathway

5.7.1 Findings of the Construct Relationships

A structural equation modeling analysis of the full structural hierarchy model with all hypothesised pathways was estimated using Maximum Likelihood (refer to Figure 5.6). In the model, there were two exogenous variables, namely Internal and External values which are assumed to be correlated and two endogenous variables, namely motivation and selection criteria. The model explained 39% of the variation on motivation and almost 62 % of the variation in selection criteria.

On the basis of a significant χ^2 goodness of fit statistic 59 (120) p =. 000, the absolute fit of this model can be considered rather poor. An examination of the structural results revealed several non-significant paths. The regression of external values on motivation was negative and not significant (-.06) and the regression of external values directly on selection criteria was positive and not significant (.15). The regression of the independent variable of internal values on a direct path to selection criteria was negative and also not significant (-2.8). However, following on from Byrne's advice (2001) in assessing the hypothesised pathways, the model was evaluated by examining in addition to χ^2 measure of absolute fit, a number of other fit indices discussed below.

The next analysis involved the inspection of fit indices of GFI, TLI, CFI and AGFI (.942, .924, .943 and .910) respectively for the Full Model. The RMSEA was .059 indicating a good fit (Hu and Bentler 1995). A Standardized SRMR of = 0.055 falls just within an acceptable range. Although the absolute fit of this model was poor (χ2 (59) = 120, p<0.000), multiple fit indices were consistent in pointing towards an acceptable fit of the hypothesised model to the data and overall to a model within acceptable standards. Jayawardhena (2004) in her application of the 'value–attitude–hierarchy' model on e-shopping reported a CFI of 0.921 and a GFI of 0.919 as comfortably above the 0.9 standard for model fit and a RMSEA outcome of .056 indicated a 'close fit'. Therefore, based on the given results, the structural equation model is confirmed. Importantly, confirmation occurs whilst acknowledging that other unexamined models might fit as well or better (Golob 2003).

5.8 Final Structural Model- Testing the Hypotheses

In order to determine the influence of psychological constructs in driving preferences in choice behaviour, three sets of hypotheses were proposed in Chapter two. The first set of hypotheses proposed an underlying causal relationship between the three drivers of personal values, motivation and selection criteria and will be discussed below. In broad terms, the proposed conceptual hierarchy model indicates values influence the level of importance students allocate to their level of motivation and to various selection criteria through both direct and indirect causal mediating psychological 'constructs' such as motivation (refer to Figure 5.7).

Figure 5.7: The Conceptual Hierarchy Model

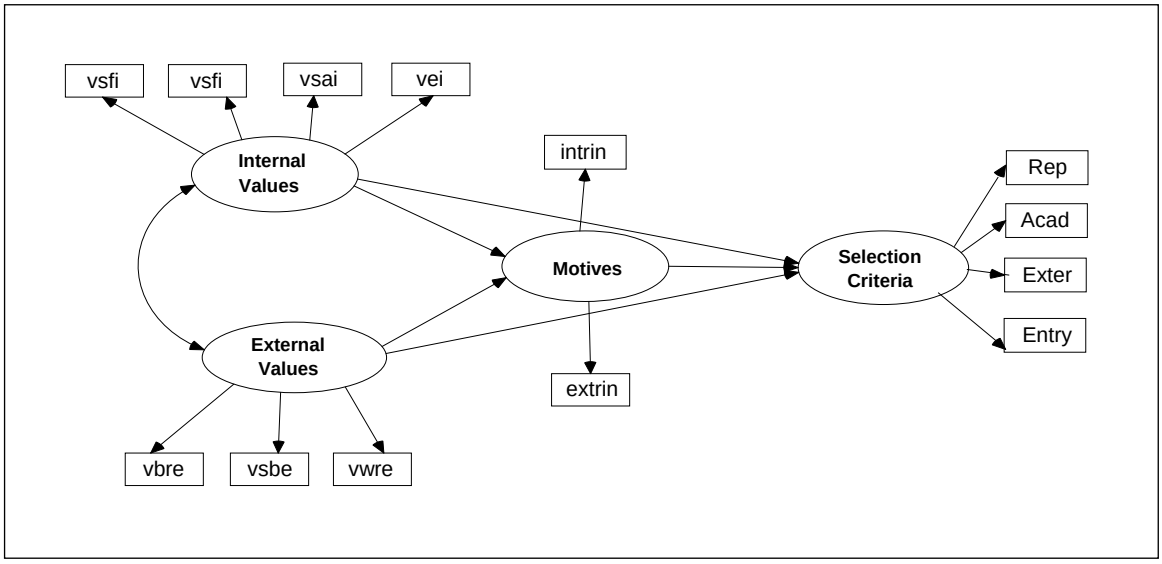


Table 5.8 displays standardised coefficients and *t*- values of the full structural equation model. Of the six hypotheses testing the proposed pathways between personal values, motivation and selection criteria of students currently enrolled at RMIT University, the data supported three hypotheses that of *H1a, H1f* and *H1c and* the three hypotheses not supported by data were that of *H1b*, *H1d* and *H1e.*

Table 5.8: Standardised Parameter Estimates for the Full Structural Model

Paths	**Standardised Factor Loadings**	**Standardised Estimate**	***t*-value**	**Hypothesis**
H1: Internal Values → Motivation	0.65	0.052	3.79	Supported
H1c: External Values → Motivation	-0.06	0.044	-.521	Not Supported
H1a: Internal Values → Selec. Criteria	0.28	0.171	-1.19	Not Supported
H1d: External Values → Selec. Criteria	0.15	0.083	1.40	Not Supported
H1e: Motivation → Selec Criteria	0.89	0.532	2.87	Supported
H1b: Values → Motivation → Selec. Criteria	$\chi^2(2) = 3.38$			Supported

5.8.1 Significant Pathways

Three of the six hypotheses were supported by the data. That of:

H1a: There is a direct and positive relationship between internal values and motivation. This path is supported by a positive estimate of 0.52 (t =3.83 p <.05)

H1f: There is a direct and positive relationship between motivation and selection criteria. This path is supported by a positive estimate of 58 (t= 2.87 p<.05). Consequently, student's selection criteria are positively affected directly by motivation and indirectly through their personal values.

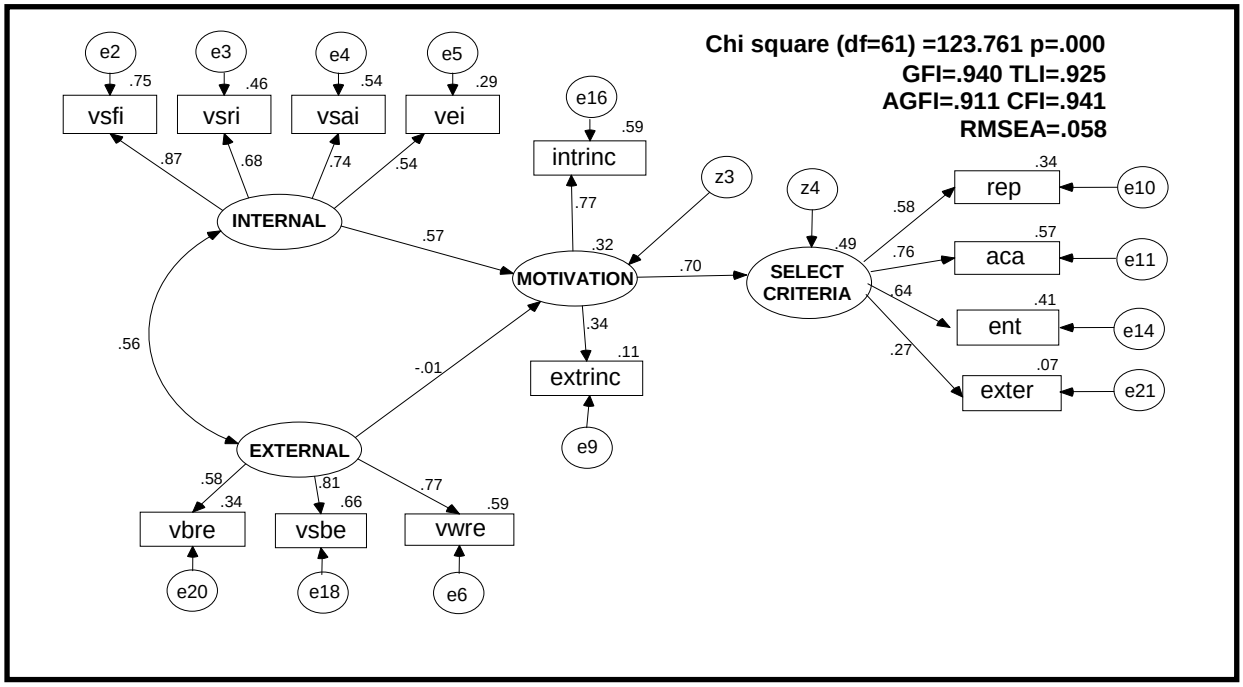
H1c: That motivation will mediate the influence of values on selection criteria. The chi square difference between the mediating model and the full model is non significant ($\chi^2(2) = 3.38$) therefore confirming motivation as a mediation variable for personal values. Consistent with the evidence in behavioural literature, personal values influence was mediated through a psychological construct, in this thesis motivation (Homer and Kahle 1988). The mediating model is discussed in further detail below.

5.8.2 Mediating Variables in the Full Model

A given variable is considered to function as a mediator to the extent that it accounts for the relation between the predictor and the criterion (Baron and Kenny 1986). Homer and Kahle (1988 p. 643) in their study of the influence of abstract values to mid-range attitudes to specific behaviours argued that values may influence behaviours both directly and indirectly through mediators, as attitudes. In the context of natural food shopping, a difference of chi square tests supported the mediating role of attitudes between the more abstract values and the more specific behaviours. Mediation effect is frequently referred to as an indirect effect. Internal values had a total effect of .56 on motivation, which is a direct effect and an estimated .39 which is an indirect (mediational) effect on selection criteria. Student's motives had a strong direct effect on influencing selection criteria. The total direct effect is estimated to .70 on selection criteria.

Comparing a mediating model with a full model (Figure 5.6) provides a test of mediation when appropriate paths are fixed and a difference in chi square is examined. The model depicted in Figure 5.8 is a mediating model suggesting the effects of both internal and external values on selection criteria are mediated by motivation, both intrinsic and extrinsic. Estimating the mediational model produces a chi square statistic for the mediating model of 123.76 with 61 degrees of freedom. The full model allows for the direct effects from both internal and external values to selection criteria. Estimating the full model produces a chi square statistic for the mediating model of 120.38 with 59 degrees of freedom.

Figure 5.8: The Mediating Hypothesis



The chi square difference between the mediating model and the full model is not significant (χ^2 (2) = 3.38). This suggests the full model does not represent a significant improvement over the mediating model. The paths between internal values and selection criteria are non significant, however the direct path from internal values to motivation reaches significance $t(1) = 3.79$. The paths between external values and motives and external values and selection criteria are non significant. This analysis demonstrates the support for the

mediating role of motivation between the more abstract values and the more specific selection criteria behaviour.

5.8.3 Non-Significant Pathways

The three hypotheses not supported by data were:

H1b: There is a direct and positive relationship between internal values and selection criteria (t =-1.19 p<.05).

H1d: There is a direct and positive relationship between external values and motivation *(t* =-.521 p <.05)

H1e: There is a direct and positive relationship between external values and selection criteria (t =1.40 p<.05)

Internal values did not influence selection criteria directly $t(1)$ = -.177) however the influence on selection criteria was indirectly mediated by the motivational construct. Selection criteria were found to be negatively influenced by both internal and external values; however these pathways were not supported by data. The proposed direct pathway of influence between external values and motivation was also insignificant and not supported by the data. The personal values domain of external values did not appear to be significant in exerting a direct influence to either motives t (1) = -.521 or to selection criteria t (1) = 1.04).

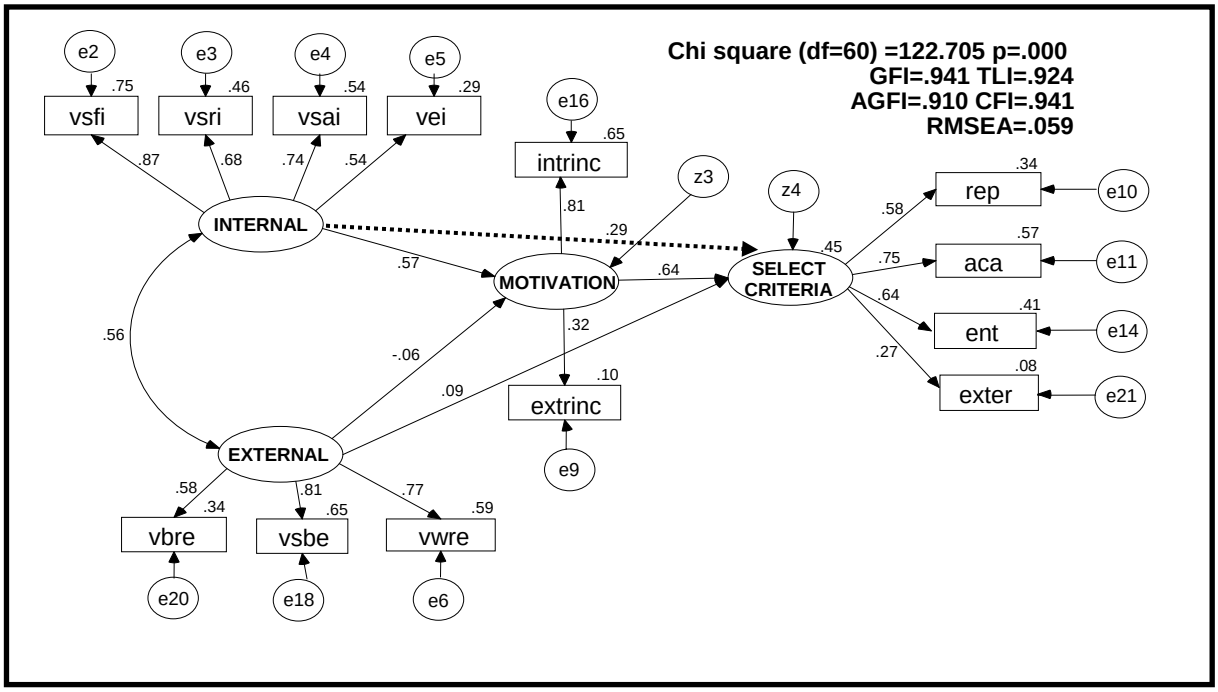
Figure 5.9 to 5.11 depicts the full model with the progressive removal of the non-significant pathways leading to the final model shown in Figure 6.11 as a result of hypothesis testing. An overview of the respective figures are:

- Figure 5.9: Partial Constraint Model (A) - *H1b:* Internal values to Selection Criteria

- Figure 5.10: Partial Constraint Model (B) - *H1d:* External values to Motivation

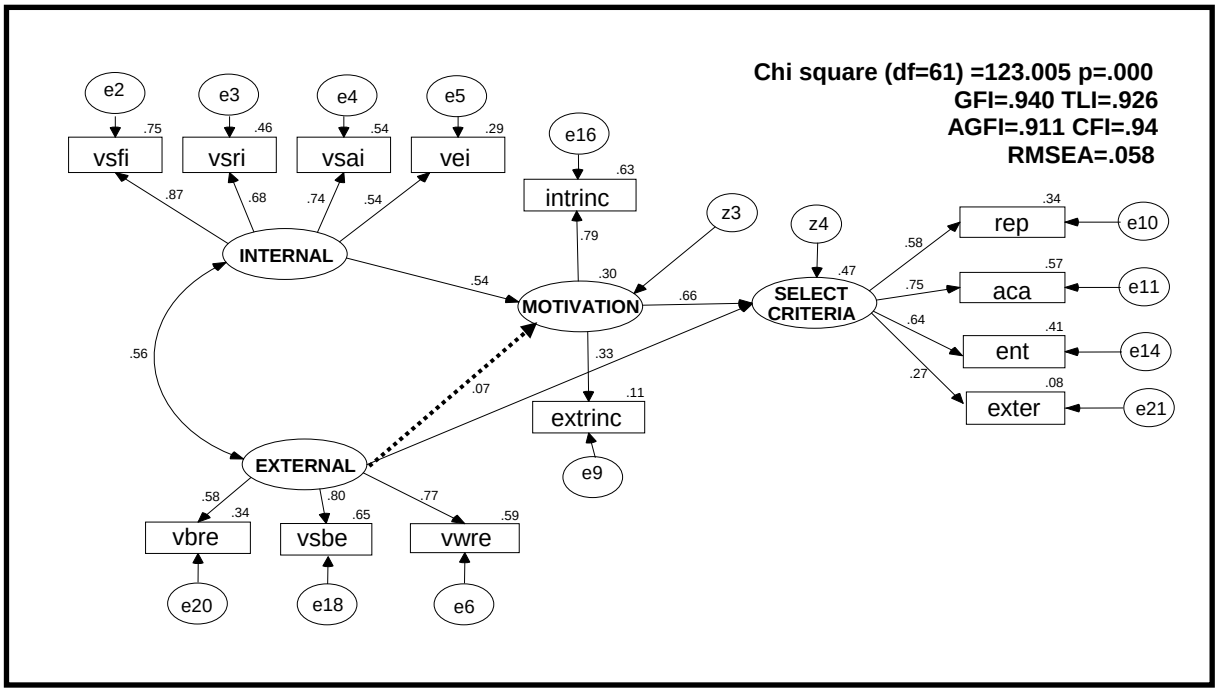
- Figure 5.11: Partial Constraint Model (C) - *H1e*: External values to Selection Criteria

Figure 5.9: Partial Constraint Model (A)



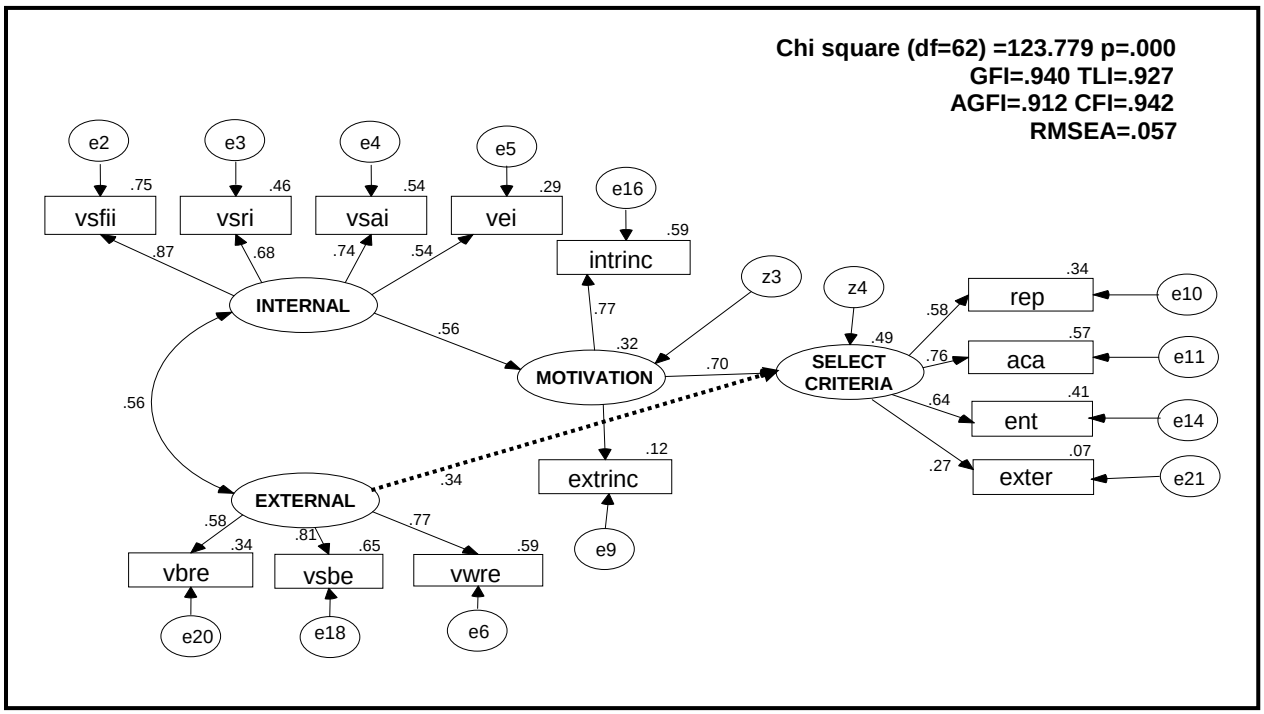
⋯⋯▸ **Non-significant pathway** (*H1b:* Internal values to Selection Criteria)

Figure 5.10: Partial Constraint Model (B)



⋯⋯▸ **Non-significant pathway** (*H1d:* External values to Motivation)

Figure 5.11: Partial Constraint Model (C)

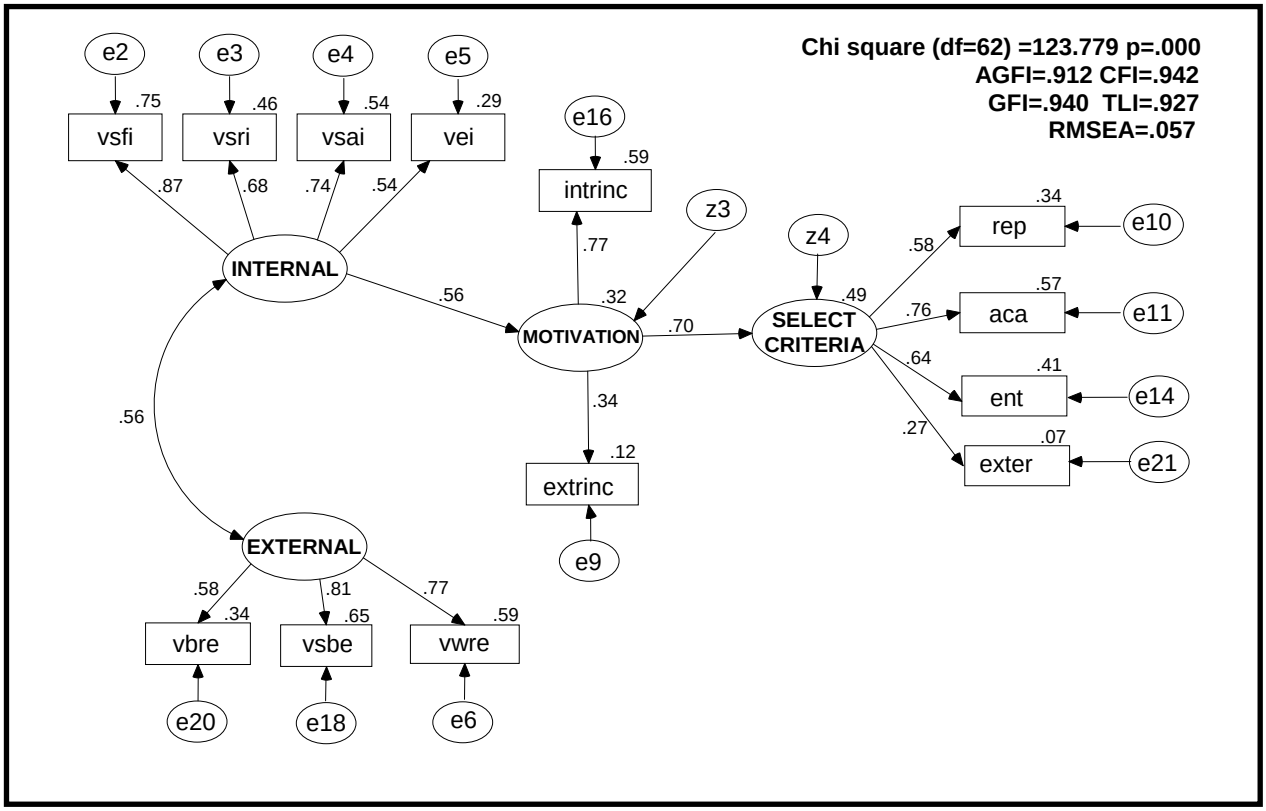


Non- significant pathway (*H1e*: External values to Selection Criteria)

5.9 The Final Structural Equation Model

Figure 5.12 shows the results from the estimated structural model where all the non-significant paths are excluded. The fit indices of GFI, TLI, CFI and AGFI for the Final Model indicate the model is within acceptable standards. A drop in RMSEA from .059 to .057 indicates the final model is a better fitting model than the full model.

Figure 5.12: The Final Structural Equation Model



5.9.1 Discussion of the Construct Relationships

The structural part of the model indicates several significant relationships, some of which are consistent with prior research. Other relationships posed contribute to the existing factors influencing student choice behaviour.

A structural equation model identified the internal dimension of *personal values* were significantly related to *motivation.* It appears students' internal personal values have a direct and positive effect on their motivation. Students' internal personal values do exert an influence on selection criteria however this influence is mitigated through motivation. It is of relevance to observe that a student's personal values had only an indirect effect in influencing which selection attribute prospective students deem important in their choice behaviour. This result clearly suggests motivation has a mediating effect upon the selection criteria attributes in the model. A student's motivation appears to be the essential construct and the main driver of the selection criteria influencing a student preference of discipline, program and university. This relationship of mediation was tested and confirmed thus

supporting the mediating role of motivation between the more abstract values and the more specific selection criteria behaviour. This outcome is consistent with prior studies that argue influence flows from abstract values to more specific behaviours and that values have only an indirect effect on end behaviour through mediating constructs (Homer and Kahle 1988; Shim and Eastlick 1998 Jayawardhena 2004). Both *intrinsic and extrinsic motivation* was significantly related to the selection criteria construct of *reputation influence; academic influence, external influence and entry influence*.

The latent variable of external values did not appear to be playing an influential role on either motivation or selection criteria, evident from the non-significant pathways between these latent constructs

5.9.2 Significant Pathways

This thesis suggests important pathways of influence amongst psychological constructs, in that; personal values follow both a direct and hierarchical pathway in influencing motivation and selection criteria. The first important pathway suggested by the model is a direct and positive relationship between internal values and motivation. The internal values of s*elf fulfilment, self respect and sense of accomplishment and excitement* were significantly related to both *intrinsic and extrinsic motivation.* These items of internal values were also listed in the top five values all respondents across the three portfolios strongly identified with. The values of *self fulfilment* (M=5.875 SD =.8474), followed by *self accomplishment* (M=5.861 SD=.8553), reported in Chapter four as having the highest level of agreement on the parenthetical definitions presented.

The second significant pathway indicates there is a direct and positive relationship between motivation and selection criteria. Extrinsic and intrinsic driven motivation was significant in influencing which selection criteria attributes prospective students deem important and relevant when considering the choice of program, discipline and university. The selection criteria observed variables of *reputation influence; academic influence, external influence; and entry influence* were instrumental in directing a prospective student's preference set. In other words, students who are strongly extrinsically driven will seek those attributes reflective of and consistent with the achievement of some external goal.

The results also suggest important indirect pathways. Consistent with the abstract nature of personal values, values as underlying determinants influence which criteria is important in selection behaviour though student's motivation. In other words favourable intrinsic and extrinsic motivation had a direct influence on selection attributes whereas internal personal values had only an indirect effect on student's selection criteria via motivation.

Summary

The empirical outcome of this thesis provides statistical evidence that the methodological approach and proposed pathway influences depicted in the structural equation model is significant. Unlike prior studies, the methodological approach sought to introduce and integrate related psychological variables of personal values, motivation and selection criteria and test this model in the context of a particular setting. The structural part of the model indicated several significant relationships; that there is a direct and positive relationship between internal values and motivation and motivation mediates the influence of internal values upon selection criteria; and that there is a direct and positive relationship between motivation and selection criteria.

The following chapter is the last analysis chapter. A discrete student choice model investigates the influence, strength and significance of the three psychological constructs of personal values, motivation, and selection criteria in addition to demographic and socioeconomic factors.

Chapter 6

A DISCRETE STUDENT CHOICE MODEL

6.1 Introduction

This chapter is the last of the result chapters. Chapter four assessed how representative the sample is with respect to preferences of particular programs, disciplines and university. A 'typical' respondent in terms of the importance allocated to the three psychological constructs of personal values, motivation and selection criteria were examined. Lastly, the properties of the three scales; Personal Values Influence Scale (PVIS), Motivation Influence Scale (MIS) and Selection Criteria Influence Scale (SCIS) were also tested. Chapter five discussed the development of a strategy for structural equation modeling and proposed significant influential pathways amongst the independent construct of personal values, motivation and selection criteria.

On the basis of prior findings, the discrete model is predicated on several key behavioural assumptions;

- that students' choice of a particular program, discipline and university is a function of underlying psychological constructs; and
- that characteristics of students are of significance in predicting their choice behaviour; and
- that a student choice model will account for the variability in choice behaviour .

This chapter introduces and discusses the application of a discrete student choice model as an analytical tool. Both a baseline and full model will be developed and proposed to explain student group membership in this case, the portfolios of Business, DSC and SET and to test a set of hypotheses. Furthermore, managerial and marketing relevance of the proposed model for strategy formation was applied through the use of simulation.

6.2 Data and Model Estimation

The analytical technique employed to assess prediction of membership in one of the three categories of choice outcome, (Business portfolio, Design and Social Context portfolio and Science and Engineering and Technology portfolio) is multinomial logistic regression. The three choice outcomes constitute the dependent outcome variable (y), and the demographic and socio economic predictors, personal values; motivation; and selection criteria constitute the explanatory variables (x) (refer to the model below). The nature of the dependent variable indicates that discrete dependent variable techniques are appropriate. Thus, the predictor variables driving a student's preferences were considered to test hypotheses *H3a, H3b* and *H3c.* That of:

The analytical technique employed is multinomial logistic regression performed through SPSS 15 to assess prediction of membership in one of the three categories of choice outcome, (Business portfolio, Design and Social Context portfolio and Science and Engineering and Technology portfolio) as the dependent outcome variable (y) regression with demographic and socio economic predictors; personal values; motivation; and selection criteria and as explanatory variables (x) (refer to the model below). Thus, the predictor variables driving student's preferences were considered to test hypotheses *H3, H3a and H3.* The nature of the dependent variable indicates discrete dependent variable techniques are appropriate.

H3a: Students' choice of selection criteria as underlying drivers will be positively associated with a student's particular preference selection set

H3b: Students' choice of personal values as underlying drivers will be positively associated with a student's particular preference selection set

H3c: Students' choice of selection criteria as underlying drivers will be positively associated with a student's particular preference selection

Model[8]

$$\Pr(y_i = j) = \frac{\exp(X_i \beta_j)}{1 + \sum_j^J \exp(X_i \beta_j)}$$

and

$$\Pr(y_i = 0) = \frac{1}{1 + \sum_j^J \exp(X_i \beta_j)}$$

6.3 Variables

6.3.1 Criterion variable

For the dependent variable the students are categorised in three classes:

- those who have nominated Business as their preferred choice portfolio to undertake a degree program (y=1).
- those who have nominated DSC as their preferred choice portfolio to undertake a degree program (y=2).
- those who have nominated SET as their preferred choice portfolio to undertake a degree program (y=0).

To estimate the model, SPSS takes SET to be the reference category. A case is predicted to belong to the group associated with the highest probability. Predicted group membership can be compared to actual group membership to obtain a measure of classification accuracy.

6.3.2 Predictor variables.

The next two sets of information are specified as explanatory variables in the multinomial logistic regression derived from the questionnaire. The first of these sets of information relates to non-metric independent variables as gender, age, country of birth and preference

[8] Where for the ith respondent y_i is the observed outcome and X_i is a vector of explanatory variables.
The unknown parameters βj are typically estimated by maximum likelihood.

selection of currently enrolled degree program to profile the student portfolio groups. The socio economic influences of parental education, occupation and aggregate income although measured on a continuous scale are also included as factors due to the collapsing of the interval scales into ordinal groupings.

The second set of data pertains to the covariates, the metric independent variables comprising of psychological constructs of personal values, motivation and selection criteria that empirical evidence suggests may be influential drivers underlying a student's preference for a particular program, discipline and university. The three predictor variables were measured on a continuous interval scale where the level of importance assigned (seven intervals Likert- type scale) to items was tested. The outcome culminated in to a data set of 76 variables. Derived factor regression scores generated were interpreted as composite measures within each dimension (Worthington and Higgs 2004).

6.4 Analysis- Baseline Model

Initially a baseline model was produced to evaluate improvement when predictor variables are added. Such an approach facilitates evaluating the predictive ability of personal values, motivation and selection taking into consideration demographic and socio economic factors.

Demographic and socioeconomic variables outlined in Table 6.1 were considered:

Table 6.1: Definition of Categorical Variables

Variable	Variable Description	Description
GENDER	Respondents' Gender	1: Female, 2: Male
AGEAGGR	Respondents' Age Group	1:17-20, 2:21-27+
COUNTRYGPS	Respondents' Country of Birth	1: Australia, 2: Asia
OCCUPATIONGPS	Respondens' Parents Occupation	1: Professional, 2: Intermediate; 3: Self Employed 4: Working

EDUCATIONGPS	Respondens' Parents Education	1: High School, 2: Diploma, 3: University 4: Postgraduate 5:Don't know
COMBINC	Respondents' Parent's Combined Income	1: $20 000- $49 000; 2: $50 000- $ 79 000; 3: $ 80 000+
PREFERENCE	Are you currently enrolled in your first preference for a degree program?	1:yes; 2: no

6.4.1. Interpretation

In order for the multinomial logistic regression question to be an adequate representation of the data, the overall relationship must be statistically significant. The classification accuracy rate must also be substantially better than could be obtained by chance alone. In addition, the stated individual relationship must be statistically significant and interpreted correctly. An initial inspection of parameter estimates examined the standard errors for the b coefficients. This was to ensure there was no evidence of numerical problems indicating possible multicollinearity among the independent variables.

Table 6 2: Model Fitting Information for Multinomial Logistic Regression

Model	**Model Fitting Criteria**	**Likelihood Ratio Tests**		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	614.729			
Final	444.387	170.341	42	.000

Table 6.2 shows whether demographic and socio economic factors provide adequate predictions in comparison to the Intercept Only (Null Model). In this analysis, the probability of the model chi square value (170.341) is significant $p < 0.00$. Therefore the stated null hypothesis that there was no difference in the model without independent variables and the model with independent variables was rejected. In other words, the existence of a relationship between demographic and socio economic factors was supported in that there is a significant relationship between the dependent variable and the set of independent variables.

6.4.2 The Classification Matrices as a Measure of Model Accuracy

The classification matrix evaluates the accuracy of the model and assesses the utility of a multinomial logistic regression model. Table 6.3 shows that overall 65% of the cases are classified correctly, ranging from 71% of the Business students; 74% of DSC students and 47% of SET students. In other words, of the cases used to create the model, 91 of the 128 students who chose to study in Business are correctly classified, 64 of the 87 students who chose to study in DSC are correctly classified and 42 of the 89 students who chose to study in SET are correctly classified. If there is a discrepancy between the predicted group membership and actual group membership, the model 'misses' for that case. This is particularly evident for SET as 36 SET students are classified as belonging to the Business portfolio. Therefore, although this current model is outperforming the null, it is an unimpressive model in predicting the SET portfolio.

Table 6.3: Classification Matrix

Observed	**Predicted**			
	Business	**Design and Social Context**	**Science, Engineering and Technology**	**Percent Correct**
Business	91	17	20	71.0%
Design and Social Context	18	64	5	74.0%
Science, Engineering and Technology	36	11	42	47.0%
Overall Percentage	**48.0%**	**30.0%**	**22.0%**	**65.0%**

Before interpreting the classification matrix, two measures will initially be applied to evaluate the accuracy of the model, *the proportional by chance accuracy rate* and *the maximum by chance accuracy rates* is computed, if deemed appropriate.

1. The proportional chance criteria for assessing model fit is calculated by summing the squared proportion that each group represents of the sample, in this case (0.470x 0.470) + (0.303 x 0.303) + (0.220 x 0.220) = 0.361. Based on the requirement that model accuracy is 25% better than the chance criteria, the standard to use for

comparing the model's accuracy is 1.25 x 0.361 = 0.456. The model accuracy rate of 65 % exceeds this standard.

2. The maximum chance criteria is the proportion of cases in the largest group, 42.1% (Business) Based on the requirement that model accuracy be 25% better than the chance criteria, the standard to use for comparing the model's accuracy is 1.25 x .421 = 52.6 %. The model accuracy rate of 65 % exceeds this standard.

6.4.3 The Likelihood Ratio Test

The likelihood ratio test (refer to Table 6.4) evaluates the overall relationship between an independent variable in this case demographics and socio economic factors and the dependent variable (portfolio choice).

Table 6.4: Results of Multinomial Logit Analysis: Likelihood Ratio Tests

Effect	Model Fitting Criteria		Likelihood Ratio Tests	
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	444.387(a)	.000	0	.
***OCCFATHER**	**458.477**	**14.090**	**6**	**.029**
OCCMOTHER	447.385	2.998	6	.809
***PREFERENCES**	**460.670**	**16.283**	**2**	**.000**
***GENDER**	**477.283**	**32.896**	**2**	**.000**
***AGEAGGR**	**479.494**	**35.107**	**2**	**.000**
***COMBINCAGG**	**453.948**	**9.561**	**4**	**.049**
***COUNTRYAGG**	**481.874**	**37.486**	**4**	**.000**
EDUCATIONFATHER	453.070	8.683	8	.370
***EDUCATIONMOTHER**	**460.147**	**15.759**	**8**	**.046**

*** Bolded items signify statistical significance**

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

The likelihood ratio tests show the contribution of each variable to the model, specifically between the dependent variable and the individual independent variables. A number of predictor variables significantly add to the prediction of student preference status using a critical value for each test that sets α =.05. In this output there is a statistically significant

relationship between the demographic variable of GENDER (.000<.05) AGEAGGR (000<.05), COUNTRYAGG (000<.05) OCCFATHER (.009 < 0.05), EDMOTHER and PREFERENCES (.000<0.05). The independent variable of COMBINAGG may be considered borderline significant (.046< 0.05)

However it is important to note even though an independent variable may indicate a relationship with the dependent variable, it may or may not be statistically significant in differentiating between classifications of groups as stipulated by the dependent variable. Furthermore, it is the WALD test statistic that assesses whether an independent variable is statistically significant in differentiating between two groups, in this case portfolios.

6.4.5 Parameter Estimates

Of the independent variables GENDER, AGEAGGR, COUNTRYAGG and OCCFATHER and PREFERENCES are significant in distinguishing between portfolios 1 (Business) from portfolio 3 (SET) and portfolio 2 (DSC) from portfolio 3 (SET). For Business and DSC respectively, EDMOTHER (.315>0.05; .369>0.05) and COMBINAGG (.412>0.05, .117> 0.05) although significant to the overall contribution of the model, did not appear significant in significant in distinguishing between portfolios in the baseline model.

6.4.6 Interpretation of Parameter Estimates

Based on the parameter estimates the following relationships can be stated considering the odds ratios for the predictors (Tabaschnick and Fidell 2007). It is important to also note the sign before the coefficient of particular variable. A positive (negative) sign implies a 'higher value of that variable for a certain individual increases (reduces) the odds' the respondents belongs to the group analysed (Business/DSC) relative to the reference group (SET) (Hernandez and Mazzon 2007, p.83).

GENDER: The odds ratio (Exp (B) = 2.833) is a relative risk ratio for comparing female students to male students for Business and DSC (Exp (B) = 7.243) relative to SET given all the other variables in the model are held constant. For females students relative to males students, the odds are expected to increase by 183.3% increase (2.833– 1.0= 1.833) (or over one and a half times) of being classified correctly as a female enrolled in Business and a

624.3% increase (7.243-1.0 = 6.243) (or over six times) in the odds of being classified as a female enrolled in DSC. In other words, survey respondents who were female increased the likelihood they are enrolled in either Business or DSC relative to SET.

AGE: The odds ratio (Exp (B) = 0.066) is a relative risk ratio for a one unit increase in age score for DSC relative to SET given all the other variables in the model are held constant. Comparing the age categories of 17 – 20 to 21+ for students enrolled in DSC relative to SET, for those students aged of 17 – 20 relative to those students enrolled in SET, the odds are expected to decrease by 92.7 % (.073-1.0= -.927) of being classified correctly as a enrolled in DSC than SET. In other words, students aged 17 -20 decreased the likelihood they are enrolled in DSC than SET. Age was not deemed differentially important in comparisons between students enrolled in Business and SET.

COUNTRY OF BIRTH: The odds ratio (Exp (B) = 5.01) is a relative risk ratio for comparing Australia to Asia as a country of birth in DSC relative to SET given all the other variables in the model are held constant. To be an Australian born student relative to a student born in Asia, the odds are expected to increase by 624.3% (7.243-1.0 = 6.243) (or over six times) of being classified correctly as a student enrolled DSC relative to SET. In other words, Australian born students increase the likelihood of being enrolled in DSC relative to SET.

OCCUPATION-FATHER: The odds ratio (Exp (B) = .308) is a relative risk ratio for comparing the different occupational categories of a respondents' father in Business and DSC (.072) relative to SET given all the other variables in the model are held constant. This socio economic predictor variable was statistically significant for both Business and DSC relative to SET for the same occupational category. The occupational category of 2 indicated all parental occupation classified at an 'Intermediate level' (Rose and O'Reilly 1998) including occupations in sales/retail and clerical/administrative roles. To be currently enrolled with parents employed in 'Intermediate' occupation roles, the odds are expected to decrease by 69.7% (.303 – 1. = -.0697) for a student enrolled in Business and 92.8% (.072 – 1.00= - 92.8) for a student enrolled in DSC relative to SET. In other words, having parents employed in the 'Intermediate' occupational category decreases the likelihood of being enrolled in both Business and DSC portfolios relative to SET

PREFERENCES: The odds ratio for Business (Exp (B) = 2.130 p = .045) and DSC (Exp (B) = .8.27 p = .000) is a relative risk ratio for comparing those students who are currently enrolled in the degree of their first preference (yes) to those who are not (no) relative to SET given all the other variables in the model are held constant. To be a student enrolled in a degree program of their first preference, the odds are expected to increase for the Business portfolio by 1.13% (2.130 – 1.00 = 1.13) and for DSC an increase of 727% (8.27 - 1.00 = 7.27) (or just over seven times). In other words, a student enrolled in the degree of their first preference increases the odds of being enrolled in both Business and DSC relative to SET.

6.4.7 Summary of Baseline Model

A multinomial logistic regression was employed to assess the prediction of membership in one of the three categories of outcome (Business, DSC and SET) first on the basis of demographic and socio economic predictors. The model overall suggested a good model fit on the basis of the profile statistics alone, using deviance statistic (chi square (444) = 401.3 p= 0.927) (Tabachnick and Fidell 2007). Correct classification on the basis of profile statistics alone is 65% overall with 71% for students enrolled in Business, 74% for students enrolled in SET and 47% for students enrolled in SET.

As an overview:

- Female respondents are more likely than male respondents to prefer to enrol in both Business and DSC than SET. The WALD test statistic is significant in the model for the predictor GENDER for Business (9.44 *p* value = .002) and DSC (28.3 *p* value = .000). With an alpha level set to 0.05, the null hypothesis is rejected and a conclusion drawn that the regression factor for GENDER has been found to be statistically significant in distinguishing between portfolios.

- Students in the 17 -20 age category are less likely than students in the 21+ age category to prefer to enrol in DSC than SET. For DSC relative to SET, the WALD test statistic for the predictor AGE is 24.9 with an associated p value of .000. With an alpha level set to 0.05, the null hypothesis is rejected and a conclusion drawn that the regression factor for AGE has been found to be statistically significant in

distinguishing between portfolio for DSC relative to SET, given that other factors and coefficients are included in the model.

- Australian born students are more likely than Asian born students to prefer to enrol in DSC than SET. For DSC relative to SET, the WALD test statistic for the predictor is 9.42 with an associated *p* value of .003. With an alpha level set to 0.05, the null hypothesis is rejected and a conclusion drawn that the regression factor for COUNTRYAGG has been found to been found to be statistically significant in distinguishing between portfolio for DSC relative to SET, given that other factors and coefficients are included in the model.

- Students whose fathers are employed in an intermediate occupation role decrease the likelihood that a student is enrolled in both Business and DSC than in SET. The WALD test statistic is significant in the model for the predictor OCCFATHER for Business (4.31 *p* value = 0 .038) and DSC (8.04 *p* value = 0.005). With an alpha level set to 0.05, the null hypothesis is rejected and a conclusion drawn that the regression factor for OCCFATHER has been found to be statistically significant in distinguishing between portfolios for DSC relative to SET, and Business relative to SET, given that other factors and coefficients are included in the model.

- Students who are enrolled in the degree program of their first preference increase the likelihood of being enrolled in the portfolios of either Business or DSC. The WALD test statistic is significant in the model for the predictor PREFERENCES for Business (4.02 *p* value = 0 .045) and DSC (13.5 *p* value = 0.000).With an alpha level set to 0.05, the null hypothesis is rejected and a conclusion drawn that the regression factor for PREFERENCE suggests to be statistically significant in distinguishing between portfolios for DSC relative to SET, and Business relative to SET, given that other factors and coefficients are included in the model.

6.5 The Full Model

To assess the influence of psychological variables proposed to drive and explain students' group membership, multinomial logistic regression analysis incorporated an additional nine psychological variables to the baseline model of Table 6.4. Psychological predictors included the personal value dimension of internal and external values; extrinsic, amotivation and intrinsic motivation and the selection criteria influences of *reputation, academic*, *entry* and *external.*

6.5.1 Analysis: Incorporation of Continuous Factor Variables

Table 6.5 shows the most important psychological drivers of the continuous variables categorised across portfolios.

Table 6.5: Description of Continuous Factor Variables

Construct	Variable Name	Label
Personal Values – Two Factors	F1INTERNAL	Internal Personal Values
	F2 EXTERNAL	External Personal Values
Selection Criteria– Four Factors	FA1REPINFL	Reputation Influence
	FA2ACADINFL	Academic Influence
	FA3ENTRYINFL	Entry Influence
	FA4EXTERINFL	External Influence
Motivation Three- Factors	FAC1EXTR	Extrinsic Motivation
	FAC2AMOTIV	Amotivation Motivation
	FAC3INTRIN	Intrinsic Motivation

To assess the level of variation amongst the introduced psychological drivers, the mean values and standard deviation was reported. The figures in Table 6.6 indicate there is little variation within some of the psychological drivers. This is particularly evident for personal values reinforcing the importance of internal values for all students across the three portfolios. Both the constructs of motivation and selection criteria showed greater variation in terms of the level of importance allocated to these drivers. In particular, the students

enrolled in the portfolio of DSC differentiated themselves from students enrolled in Business and SET portfolios in terms of the level importance allocated to a particular item. These results are broadly in keeping with prior descriptive analyses of chapter four suggesting that the importance students attach to psychological drivers may not only influence student choice, but account for the variability in that choice behaviour. To represent these drivers, estimated factor scores derived in chapter four are used.

Table 6.6: Mean value of the Most Important Continuous Variables by Portfolio

Most Important Variable of:			
Personal Values	**BUS**	**DSC**	**SET**
Self Respect	***M=6.11SD=.1.24**	M= 5.97SD=1.04	M=5.99 SD=1.06
Self Fulfilment	M=6.07 SD=1.28	**M=6.36 SD=.997**	M=6.25 SD=.935
Self Fulfilment	M=6.07 SD=1.28	M=6.36 SD=.997	**M=6.25 SD=.935**
Motivation			
Extrinsic (m) "*Getting a degree will allow me to get the job I want".*	**M=5.91, SD=1.30**	M= 5.49SD= 1.52	M= 5.92 SD=1.29
Intrinsic (b) "*I want to become a better educated person".*	M=5.64 SD=1.36	**M= 5.81 SD=1.28**	M= 5.39 SD=1.40
Extrinsic (g) "G*aining a degree will allow me to earn more money".*	M=6.00 SD=1.14	M= 4.42 SD=1.73	**M= 6.40SD=.987**
Selection Criteria			
Job Opportunities	**M= 6.38 SD=1.21**	M= 5.33 SD=1.75	M=6.08 SD= 1.19
Course Suitability	M= 5.97 SD=1.22	**M=6.48 SD= .874**	M=5.89 SD= 1.20
Job Opportunities	M= 6.38 SD=1.21	M= 5.33 SD=1.75	**M=6.08 SD= 1.19**

*** Bolded values indicate the most important for that portfolio**

6.5.2 Likelihood Ratio Test

In Full model analysis, the probability of the model chi square (278.471) was .000 less than or equal to the level of significance of .05. (refer to Table 6.7). Therefore the stated null hypothesis that there was no difference the model without independent variables (both

metric and metric) and the model with independent variables was rejected. In other words, the existence of a relationship between demographic and socio economic factors and predictor metric variables was supported.

Table 6.7: Model Fitting Information for Multinomial Logistic Regression

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	657.788			
Final	379.316	278.471	60	.000

6.5.3 The Classification Matrices as a Measure of Model Accuracy

The classification matrix in logistic regression evaluates the accuracy of the model and assesses the utility of a multinomial logistic regression model (refer to Table 6.8). Evaluation of the accuracy of the model, shows the model accuracy rate of almost 74% exceeds the proportional chance criteria (1.25 x 0. 359 = 0.44) and the maximum chance criteria (52.6%).

Table 6.8: Classification Matrix

Observed	Predicted			
	Business	**Design and Social Context**	**Science, Engineering and Technology**	**Percent Correct**
Business	103	3	22	80.5%
Design and Social Context	8	73	6	83.9%
Science, Engineering and Technology	30	11	48	53.9%
Overall Percentage	**46.4%**	**28.6%**	**25.0%**	**73.7%**

The classification table shows that overall almost 74% of the cases are classified correctly; ranging from 80.5% of the Business students, 84% of DES students and 54% of SET students. In other words, of the cases used to create the model, 103 of the 128 students who chose to study in Business are correctly classified; 73 of the 87 students who chose to study in DSC are correctly classified and 48 of the 89 students who chose to study in SET are correctly classified. Although this current model is outperforming the null, as with the baseline model, the model is only satisfactory as a predicting model for the SET portfolio. Of interest for the SET portfolio are the 30 respondents the model 'misses' classified as belonging to the Business portfolio; however are in fact students currently enrolled in SET.

Inspection of the descriptive statistics (refer to chapter 4) provided some insight into the classification discrepancy occurring for SET. The descriptive statistics indicated 78% of all students surveyed reported they are currently enrolled in the degree program of their first preference. DSC reported a very strong majority of 95% of first year students currently enrolled in the degree programs of their first preference followed by the Business portfolio reporting 79% of students and students currently enrolled in SET reported at almost 61%. This implies the remaining 39% of students are enrolled in SET are enrolled a degree program of their second preference. A random selection of respondents currently enrolled in the SET portfolio identified a range of different first preference degree programs. For example, for first preference degree program R*espondent 39* indicated a 'Business' degree, *Respondent 53, a* 'Biomedical Science' degree, and *Respondent 37* a degree in 'Physiotherapy'. Furthermore, the variable PREFERENCE was significant (.000<0.05) in distinguishing between portfolios. Affirmative preference scores (enrolled in a degree program of your first choice) increased the likelihood that a student was enrolled in Business and DSC instead of SET. Furthermore, at a portfolio level, of the 5% of DSC students who did not enrol in their first degree preference, only 2% enrolled in a different discipline area. Students from SET indicated 29% enrolled in a discipline different to their first preference, as did 13% of students currently enrolled in the Business portfolio.

6.5.4 The Likelihood Ratio Test

The likelihood ratio test (see Table 6.9) evaluates the overall relationship between demographics and socio economic factors, the three psychological predictor variables and the dependent variable (portfolio choice).

Table 6.9: Results of Multinomial logit analysis: Likelihood Ratio Tests

Effect	**Model Fitting Criteria**	**Likelihood Ratio Tests**		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	379.316(a)	.000	0	
INTERNAL	380.021	.704	2	.703
***EXTERNAL**	**385.672**	**6.355**	**2**	**.042**
***REPUTATION**	**394.693**	**15.376**	**2**	**.000**
ACADEMIC	379.562	.246	2	.884
***ENTRY**	**386.642**	**7.325**	**2**	**.026**
***EXTERNAL**	**387.189**	**7.873**	**2**	**.020**
***EXTRTINSIC**	**404.484**	**25.167**	**2**	**000**
AMOTIVATION	382.234	2.918	2	.232
***INTRINSIC**	**390.770**	**11.453**	**2**	**.003**
***OCCFATHER**	**394.087**	**14.770**	**6**	**.022**
OCCMOTHER	386.841	7.524	6	.275
***PREFERENCES**	**393.318**	**14.002**	**2**	**.001**
***GENDER**	**415.564**	**36.248**	**2**	**.000**
***AGE**	**396.330**	**17.014**	**2**	**.000**
***COMBINEDINC**	**396.061**	**16.745**	**4**	**.002**
***COUNTRYAGG**	**409.544**	**30.228**	**4**	**.000**
EDFAAGG4	390.395	11.078	8	.197
***EDMOAGG4**	**398.081**	**18.765**	**8**	**.016**

*** Bolded items signify statistical significance**

In this output, there is a statistically significant relationship between the demographic variables of GENDER (.000<.05) AGEAGGR (000<.05), COUNTRYAGG (000<.05), OCCFATHER (.009<0.05) and EDMOTHER (.016< .05) and PREFERENCES (.000>0.05). With the influence of the metric covariates, COMBINAGG is now clearly significant (.002<0.05). A number of predictor variables which significantly add to the prediction of student preference status using a critical value for each test that sets α =.05 were EXTERNAL values (.042<.05); motives of EXTRINISIC (.000< .05); and

INTRINSIC (.003< .05), and Selection criteria of REPUTATIONAL INFL (.000<.05), ENTRY INFL (.026<.05) and EXTERNAL INFL (.020. < .05).

6.5.5 Parameter Estimates Statistics:

COMBINED INCOME: The odds ratio for DSC (Exp (B) = .158 p = .025) is a relative risk ratio for comparing the different combined income categories of parents of students enrolled in DSC relative to SET given all the other variables in the model are held constant. For students who have their parents combined income falling in the $20,000 to $49,000, the odds are expected to decrease by 84% (.158– 1. = - 0.842) of being classified as a student enrolled in the portfolios of DSC relative to SET. In other words, currently enrolled students who have parents combined income falling in the $20,000 to $49,000 decreased the likelihood likely to prefer to enrol in DSC than SET. Based on the Wald Statistic, the regression factor for COMBINCOME has been found to be statistically different (0.025 < 0.05) for DSC relative to SET, given that other factors and coefficients are included in the model. Parent's combined income however was not deemed differentially important in comparisons between students enrolled in Business and SET.

EDUCATION MOTHER: The odds ratio for DSC (Exp (B) = 31.6 p = .009) is a relative risk ratio comparing the highest level of education attained by the mother of students enrolled in DSC relative to SET. For students whose mother has attained an education qualification at a postgraduate level, the odds are expected to increase by (31.6 – 1. = 30.6) of being classified as a student enrolled in the portfolios of DSC relative to SET. In other words, students enrolled in DSC whose mother qualified at a postgraduate level of education are more likely to prefer to enrol in DSC than SET. The educational attainment of a mother was not deemed differentially important in comparisons between students enrolled in Business and SET. The Wald test is significant in the model for the predictor EDUMOTHER for DSC (6.89 p = 0.009). With an alpha level set to 0.05, the null hypothesis is rejected and a conclusion drawn that the regression factor for EDUMOTHER suggests to be statistically significant in distinguishing between portfolios given that other factors and coefficients are included in the model. However the fathers' level of education was not deemed be differentially important.

This finding was consistent with previous results undertaken in chapter four. The outcome of a chi square test indicated that there was a relationship between the level of a mother's educational attainment $\{\chi^2 (6 N= 305) = 16.04 p< .05)\}$ and decision to pursue a particular degree program. Furthermore, this outcome gave support to a traditional school of thought whereby in the case of parental education, is often considered that the mother's educational level is of primary importance (Marks et al. 2000 p.15). The chi square outcome suggested the educational status of fathers was not significant factor in influencing an undergraduate student's preference choice; $\{\chi^2 (6, N= 304) = 6.083 p>.05\}$ when making their decision to pursue a particular discipline in the tertiary field.

6.5.6 Predictor Variables

REPUTATION INFLUENCE (REPINFL): The odds ratio (Exp (B) = 2.010 p = .000) is a relative risk ratio for a one unit increase in REPINFL score for Business relative to SET given the other variables in the model are held constant. A one unit increase in REPINFL score is associated with a 101% increase (2.01 – 1. = 19.1) in the odds of being classified as a student enrolled in the portfolios of Business relative to SET. In other words, students who consider reputation as a strong influence on their selection criteria are more likely to prefer to enrol in Business than SET. The Wald test is significant in the model for the predictor REPINFL for Business (12.4 p = 0.000).With an alpha level set to 0.05, the null hypothesis is rejected and a conclusion drawn that the regression factor REPINFL suggests to be statistically significant in distinguishing between portfolios given that other factors and coefficients are included in the model.

EXTERNAL INFLUENCE (EXTERINFL): The odds ratio (Exp (B) = 1.576 p = .038) is a relative risk ratio for a one unit increase in EXTERINFL score for Business relative to SET given the other variables in the model are held constant. A one unit increase in EXTERINFL score is associated with an almost a 58% increase (1.576 – 1. = .576) in the odds of being classified as a student enrolled in the portfolios of Business relative to SET. In other words, students who consider external influences as a driver on their selection criteria are more likely to prefer to enrol in Business than SET. The Wald test is significant in the model for the predictor EXTERINF for Business (4.31 p = 0.038).With an alpha level set to 0.05, the null hypothesis is rejected and a conclusion drawn that the factor

EXTERINFL suggests to be statistically significant in distinguishing between portfolios given that other factors and coefficients are included in the model.

In terms of what attributes were deemed relevant and important to students enrolled in Business, both *reputation* and *externa*l influences become paramount. This outcome mirrors the results attained in chapter five. Reputation influences ranked as the most important for this cohort of students included all four of the items; 'course suitability', 'program reputation', 'university reputation' and 'university status and prestige'. The ordering of selection criteria suggests for Business applicants, 'academic' quality and reputation is of utmost importance when considering what degree program and where to study once a decision to undertake tertiary education is taken. Business students' prioritising of 'job opportunities' as the most important selection criteria suggested the association this cohort of students have with a vocational view of education.

ENTRY INFLUENCE (ENTRINFL): The odds ratio (Exp (B) = 1.918 p = .017) is a relative risk ratio for a one unit increase in ENTRYINFL score for DSC relative to SET given the other variables in the model are held constant. A one unit increase in ENTRYINFL score is associated with a 92% increase (1.918 – 1. = .918) in the odds of being classified as a student enrolled in the portfolios of DSC relative to SET. In other words, students who consider entry influences as a driver on their selection criteria are more likely to prefer to enrol in DSC than SET. The Wald test is significant in the model for the predictor ENTRYINFL for DSC (5.74 p = 0.017). With an alpha level set to 0.05, the null hypothesis is rejected and a conclusion drawn that the regression factor ENRYINFL suggests to be statistically significant in distinguishing between portfolios given that other factors and coefficients are included in the model. Entry influence as a differentiating attribute for students enrolled in DSC supported what this cohort of student deemed important when considering their choice behaviour. Less vocationally oriented, students enrolled in DSC expressed importance towards 'entry requirements' and 'location' as important selection attributes.

INTRINSIC MOTIVATION (INTRINMOT): The odds ratio (Exp (B) = .626 p = .050) is a relative risk ratio for a one unit increase in INTRINSIC MOTIAVION score for Business relative to SET given the other variables in the model are held constant. A one unit increase in INTRINMOT score is associated with a 37% decrease (.626- 1. = -.374) in the odds of being classified as a student enrolled in the portfolios of Business relative to

SET. In other words, students enrolled in Business who consider intrinsic motives as a driver are less likely to prefer to enrol in Business than SET. The Wald test is significant in the model for the predictor INTRINMOT for Business (3.84 p = 0.05).With an alpha level set to 0.05, the null hypothesis is rejected and a conclusion drawn that the regression factor INTRINMOT suggests to be statistically significant in distinguishing between portfolios given that other factors and coefficients are included in the model.

EXTRINSIC MOTIVATION (EXTRMOT) The odds ratio (Exp (B) = .265 p = .000) is a relative risk ratio for a one unit increase in EXTRMOT score for DSC relative to SET given the other variables in the model are held constant .A one unit increase in EXTRMOT score is associated with an almost 74% decrease (.265- 1 =-.735) in the odds of being classified as a student enrolled in the portfolio of DSC relative to SET. In other words, students who rate extrinsic motives as important drivers are less likely to prefer to enrol in DSC than SET. Wald test is significant in the model for the predictor EXTRMOT for DSC (14.6 p = 0.000). With an alpha level set to 0.05, the null hypothesis is rejected and a conclusion drawn that the regression factor EXTRMOT suggests to be statistically significant in distinguishing between portfolios given that other factors and coefficients are included in the model.

6.6 Hypothesis Tests

The multinomial parameter estimates provides specific information on effects of each predictor variable. Hypotheses were treated in terms of significance and direction of parameter estimates (Lee, Kwon and Schumann 2005). In order to determine the influence of psychological constructs in driving preferences in choice behaviour once a decision is made to enter higher education, three sets of hypotheses were proposed. The third set of hypotheses will be discussed below.

The third set of hypotheses proposed the likelihood of psychological constructs being positively associated with a student's particular preference selection set.

H3a: Students' choice of personal values as underlying drivers will be positively associated with a student's particular preference selection set

H3b: Students' choice of types of motivation as underlying drivers will be positively associated with a student's particular preference selection set.

H3c: Students' choice of selection criteria as underlying drivers will be positively associated with a student's particular preference selection set.

6.6.1 Full Model:

H3a: Students' choice of personal values as underlying drivers will be positively associated with a student's particular preference selection set.

Internal values were not found to be significant to the overall discrete student choice model and were therefore not considered to be statistically different amongst the respondents enrolled in the three different portfolios. In other words, all students considered internal values important and deemed relevant in their preference behaviour. This outcome was consistent with the findings of chapter five and chapter six. The descriptive analysis suggested that all students across the different portfolios and enrolled in different programs showed strong agreement towards the 'internal' value dimension. The relevance of internal values as an underlying driver of choice behaviour was also reflected in the hierarchy model which suggested; *internal values* were significantly and positively related to both *intrinsic and extrinsic motivation* and had an indirect influence on *selection criteria* mediated through *motivation*. Although external values were found to be significant to the overall contribution model, these values did not appear to be statistically different amongst the respondents enrolled in the three portfolios. Overall, personal values as underlying drivers were not found to be significant in differentiating between portfolios, therefore *H3a* was not supported.

H3b: Students' choice of types of motivation as underlying drivers will be positively associated with a student's particular preference selection set.

Intrinsic motivation was found to be just a significant factor differentiating students between students enrolled in Business (β =-.468 p = .050) and SET. In other words, students enrolled in Business who considered intrinsic motivation as an important driver

were less likely to prefer to enrol in Business than SET. However intrinsic motivation was also not deemed be differentially important in comparisons between students enrolled in DSC and SET. Overall, although intrinsic motivation was as a significant predictor, it was found to be *negatively* associated with a student's particular preference selection set, thus lending only partial support for *H3b.*

Extrinsic motivation was found to be a significant factor differentiating students between students enrolled in DSC (β = -1.328 p = .000) and SET. In other words, students enrolled in DSC who consider extrinsic motivation as an important driver are *less likely* to prefer to enrol in SET than DSC. However intrinsic motivation was also not deemed as differentially important in comparisons between students enrolled in Business and SET. Overall, although extrinsic motivation was a significant predictor, it was found to be *negatively* associated with a student's particular preference selection set, thus lending only partial support for *H3b.*

H3c: Students' choice of selection criteria as underlying drivers will be positively associated with a student's particular preference selection set.

Reputation influence was found to be a significant factor differentiating students between students enrolled in Business (β =.698 p = .000) and SET. In other words, students who consider reputation as a strong influence in their selection criteria are more likely to prefer to enrol in Business than SET. However reputation influences was also not deemed be differentially important in comparisons between students enrolled in DSC and SET. In sum, reputation influence was found to be positively associated with the probability of a student choosing a particular preference set, therefore *H3c* was supported.

External influence was found to be a significant factor differentiating students between students enrolled in Business (β =.455 p = .038) and SET. In other words, students who consider external influences as a driver on their selection criteria are more likely to prefer to enrol in Business than SET. However external influences were also not deemed be differentially important in comparisons between students enrolled in DSC and SET. In sum, external influence was found to be positively associated with the probability of a student choosing a particular preference set, therefore *H3c* was supported.

Entry influence: was found to be a significant factor differentiating students between students enrolled in DSC (β =.651 p = .017) and SET. In other words, students who consider entry influences as a driver on their selection criteria are more likely to prefer to enrol in DSC than SET. However entry influences were also not deemed be differentially important in comparisons between students enrolled in Business and SET. In sum, entry influence was found to be positively associated with the probability of a student choosing a particular preference set, therefore *H3c* was supported.

6.6.2 Summary of the Discrete Student Choice Model

A multinomial logistic regression was employed to assess the prediction of membership in one of the three categories of outcome (Business, DSC and SET) first on the basis of demographic and socio economic predictors, and second, with the addition of three metric drivers. The pseudo coefficients of determination for the model are relatively high (Cox & Snell =.600, Nagelkerke .678 McFadde .423) (Hernandez and Mazzon 2006, Tabachnick and Fidell 2007). The Nagelkerke measure as a pseudo coefficient of determination is an often preferred measure, since it ranges from 0 to 1, while 'Cox and Snell have a maximum that is less than 1.00' (Leishman and Watkins 2002, p.314). The model classification table indicates the discrete student choice model predicting correctly almost 74% of the time, correctly classifying almost 81% for Business group, 84% for the DSC group and almost 54% for the SET group. In conclusion, the student choice model can be effectively used by marketers in education to predict the portfolio type selected by prospective students.

6.7 Application of Student Choice Model

Study results have led to the identification of a significant set of variables which influence the choices prospective undergraduate student's make in selecting a particular program, discipline and university. The likelihood ratio of the model is highly significant (p =.000) suggesting an undergraduate students choice of behaviour of selecting a particular program, discipline and university can be well explained by this set of particular explanatory predictor variable. As a result educational marketers can develop segmented marketing strategies to influence choice behaviour of prospective students. Accordingly, to illustrate the marketing application of the student choice model, *student types* were generated and the results discussed in this section.

Probability outputs for student classification were estimated on the basis of modal values for characteristics (refer to Table 6.10) and average values for derived factor variables (refer to Table 6.11).

Table 6.10: Modal Values for Demographic and Socio Economic Variables

Portfolio	**Business**	**DSC**	**SET**
Gender	Female (1)	Female (1)	Male (2)
Age Aggregate	17- 20(1)	21- 27 (2)	17- 20 (1)
Country of Birth	Australia (1)	Australia(1)	Australia (1)
Preferences	Yes (1)	Yes (1)	Yes (1)
Occupation- Father	Professional (1)	Professional (1)	Professional (1)
Occupation- Mother	Working (4)	Professional (1)	Working (4)
Education – Father	University (3)	University (3)	University (3)
Education – Mother	At least High School (1)	University (3)	At least High School (1)
Combined Income	$80 000- $90 000 (3)	$80 000- $90 000 +(3)	$50 000- $80 000 (3)

Table 6.11: Average Values of Derived Factor Variables

Portfolio	**Business**	**DSC**	**SET**
Selection Criteria:			
Reputation Influence	0.2144719	-0.0440308	-0.2654126
Academic Influence	-0.0148854	0.0322597	-0.0101266
Entry Influence	0.0545619	0.1028874	-0.1790464
External Influence	0.3308722	-0.5446211	0.0565213
Motivation			
Extrinsic	0.2791487	0.5587757	0.1447467
Amotivation	0.2810578	-0.4772184	0.0622765
Intrinsic	-0.1908398	0.4350080	-0.1507664
Personal Values			
Internal	-0.0751254	0.4350080	0.0382182
External	0.2665618	-0.2653717	- 0.1239615

6.7.1 Consideration of a Typical Portfolio 'Student Type'

Based on the above average values, the student choice model was used to predict the probability of the three outcomes. Table 6.12 shows that for the typical Business student, a 99.99% accuracy rate was found; for a student enrolled in DSC, a 99.71% accuracy rate was predicted, and for a student enrolled in SET an almost accuracy rate of 75% was found. These prediction rates are proportional to the results specified from the classification matrix (refer to Table 6.8).

Table 6.12: Probability output for the 'Typical' Portfolio Student

Students Classification	Probability Values		
	Pr(BUS)	Pr(DSC)	Pr(SET)
Business	**0.999985**	1.38E-06	1.33497E-05
DSC	0.00174	**0.997176**	0.001084
SET	0.056757	0.194958	**0.748285**

To further investigate the effectiveness of the student choice model, two students enrolled in each portfolio were randomly chosen and their particular profile constituted the basis for a prediction change of this group membership. The student model was particularly effective in predicting group membership for those students enrolled in both Business (92.6% and 99.7%) DSC (both 99%). However, as expected the choice model was an unimpressive predicting model for students enrolled in SET (48% and 38% respectively), as shown in Table 6.13.

Table 6.13: Profile of Random 'Student Types'

Students Classification	Probability Values		
	Pr(BUS)	Pr(DSC)	Pr(SET)
BUSINESS			
Respondent *162*	**0.926321**	0.073569	0.00011
Respondent *211*	**0.997129**	0.002707	0.000163

DSC			
Respondent *231*	0.000582	**0.999231**	0.000188
Respondent *294*	6.87E-06	**0.999987**	6.22E-06
SET			
Respondent *37*	0.517474	3.73E-05	**0.482489168**
Respondent *28*	0.241515	0.3709	**0.387584**

6.7.2 Student Types

Two students were chosen at random from the Business portfolio. Firstly, *Respondent 162* is a Chinese born female, aged 17-20 years, Australian HECS upfront school leaver student who is currently enrolled in the Business portfolio in a degree program (Bachelor of Business–Accounting) and university (RMIT University) of her first preference. Both of her parents are Chinese born. The respondent's father has completed a university degree as his highest level of educational attainment and her mother has completed High School. Her father is professionally employed and her mother falls in category 4 (worker). The combined family income falls in to the $30,000 - $39,000 income bracket.

In terms of selection criteria, respondent *162* considers F1 *Reputation* influences and F4 *External* Influences as the most important influences and is strongly extrinsically motivated. Internal values indicated the strongest level of agreement with the value statements.

Secondly, *Respondent 211* is an Australian born male, aged 17-20 years Australian HECS upfront school leaver student who is currently enrolled in the Business portfolio in a degree program (Bachelor of Business – Accounting) and university (RMIT University) of his first preference. Both of his parents are Australian born. The respondent's father has completed a university degree as the highest level of educational attainment and his mother has completed Primary School. His father is professionally employed and his mother falls in category 4 (worker). The combined family income falls in to the 80,000 - $90,000 and over income bracket.

In terms of selection criteria, respondent *211* considers F1 *Reputation* influences and F4 *External* Influences as the most important influences and is strongly extrinsically motivated. In contrast to the respondents *162* external values indicated the strongest level of agreement with the value statements.

Two students were chosen at random from the DSC portfolio. Firstly, *Respondent 231* is an Australian born female aged 21-24 years, HECS upfront mature aged student who is currently enrolled in the DSC portfolio in a degree program (Bachelor of Fine Arts) and university (RMIT University) of her first preference. One of her parents is Australian born, the other parent born overseas. Both of the respondent's parents completed a university degree as the highest level of educational attainment and are both professionally employed. The combined family income falls in to the $90,000 and above income bracket.

In terms of selection criteria, *Respondent 231* considers criteria F3 *Entry* Influences as the most important followed by *Academic* and *Reputation* influences. Intrinsic motives rate the most important as are internal values.

Secondly, *Respondent 294* is an Australian born female aged 21-24 years HECS deferred matured aged student who is currently enrolled in the DSC portfolio in a degree program Bachelor of Arts (Criminal Justice Administration) and university (RMIT University) of her first preference. Both of her parents are Australian born. Her father completed a Diploma as the highest level of educational attainment and her mother completed High School. The respondents' father is professionally employed and mother is a part time worker. The combined family income falls in to the $70,000 - $79,000 income bracket.

In terms of selection criteria, *Respondent 239* showed identical selection criteria to respondents *231* rating *Entry* Influences followed by *Academic* and *Reputation* influences as the most important. Intrinsic motivation was considered the most important in comparison to extrinsic motivation. However, some extrinsic motives, although less important also were relevant. This result is consistent with the descriptive analysis where an extrinsic motive was included in DSC's 'The Top Five Motivation' (see Table 4.19). The selection criteria influence of reputation influences were also deemed important particularly, item (a) '*A degree will allow me to get a prestigious job'*. Internal values indicated the strongest level of agreement with the value statements.

Two students were chosen at random from the SET portfolio. Firstly, *Respondent 37* is an Australian born male aged 17-21 years HECS upfront school leaver who is currently enrolled in the SET portfolio in a degree program (Bachelor of Applied Chemistry/Chemical Engineering) and university (RMIT University) of his third preference. Both of his parents are Australian born. The respondent's father completed a

University degree as the highest level of educational attainment and his mother completed a Diploma. Both parents are classified as 'self employed' (3) and combined family income falls in to the $ 90,000 and over income bracket.

In terms of selection criteria, *Respondent 37* considers criteria F1 *Reputation* influences and F3 *Entry* Influences as the most important influences. Extrinsic motives rate the most important as do predominately internal values.

Secondly, *Respondent 28* is a Chinese born male aged 17-21 years International full fee paying upfront school leaver who is currently enrolled in the SET portfolio in a degree program (Bachelor of Science (Applied Chemistry)) and university (RMIT University) of his first preference. Both of his parents are Chinese born. Both of the respondent's parents completed a High School as their highest level of educational attainment. Both of his parents are classified as self employed (3) and the combined family income falls into the $30,000 – 39,000 and over income bracket.

In terms of selection criteria, *Respondent 28* considers criteria F1*Reputation* Influences and F3 *Entry* Influences as the most important influences. Extrinsic motives rate the most important, and in personal values, although internal values indicated the strongest level of agreement with the value statements, there is also an underlying external value influence.

6.7. 3 Summary of Model Application

As previously noted, the student choice model was effective in predicting the classification of students enrolled in both Business and DSC, however the model was just satisfactory for students enrolled in SET. Several underlying patterns emerged with closer inspection of both the factors and coefficients of students enrolled in SET. If classification occurred on socioeconomic and demographic factors alone, the characteristics displayed of randomly chosen students from SET clearly differentiated these students from the other two student cohorts of Business and DSC. For example with both *Respondent 37 and Respondent 28,* there is almost an 83% and 71% respectively; the students are accurately predicted as student enrolled in the SET portfolio. However, with the inclusion of the psychological constructs, the likelihood shifts from classification of a student enrolled in SET (R*espondent 37:* 45% to 53% *and Respondent 28:* 13% to 36%*)* to a student enrolled in

Business. This suggests student enrolled in both SET and Business reflect similar underlying psychological drivers as influencers on preference choices. This was also confirmed by the similarities displayed in terms of importance allocated to psychological constructs (see Table 6.14).

Table 6.14: Overview of Psychological Constructs

Portfolio	Business	DSC	SET
Personal Values	*Internal* Sense of Accomplishment	*Internal:* Self Fulfilment	*Internal :* Sense of Accomplishment
Motivation	*Extrinsic* "A degree will enable me to get to prestigious job"	*Intrinsic* "I want to become a better educated"	*Extrinsi*c "Gaining a degree will allow me to gain more money'
Selection Criteria	*External Influence* "Job Opportunities"	*Reputation Influence* "Course Suitability"	*External Influence* "Job Opportunities"

6.8 Application of Multinomial Logit Model: Simulation Analysis

To investigate what effects changes in derived factor scores have on the probability of predicting students' group membership, in this case the portfolios of Business, DSC and SET, a set of simulation analyses were conducted (Oppenheim 1999). Using the estimated coefficients of predicator variables, a Microsoft Excel worksheet was constructed to compute the portfolio choice probabilities for student groups. For a given derived factor variable, the three outcome probabilities were computed over the range of values (-2 to + 2) for that factor variable. These outcome probabilities are computed setting all other variables in the model to their average or modal values. These computed probabilities are then plotted over the range of values for the factor variable.

6.8.1 Simulation of Changes - Selection Criteria

Selection Criteria – Reputation Influence

As expected from the descriptive analysis, as there is a change to the mean value of reputation influence from largely negative (*not at all important*) to strongly positive (*extremely important*) the probability of being a classified as a student enrolled in DSC and SET steadily decreased, while the probability of being classified as a student enrolled in Business steadily increased. There is a clear cross over effect occurring when students enrolled in Business 'take over' students in both DSC and SET as the most likely students whom allocate particular importance to the selection criteria of 'reputation' influence.

Figure 6.1: Selection Criteria – Reputation Influence *(FA1REPINL)*

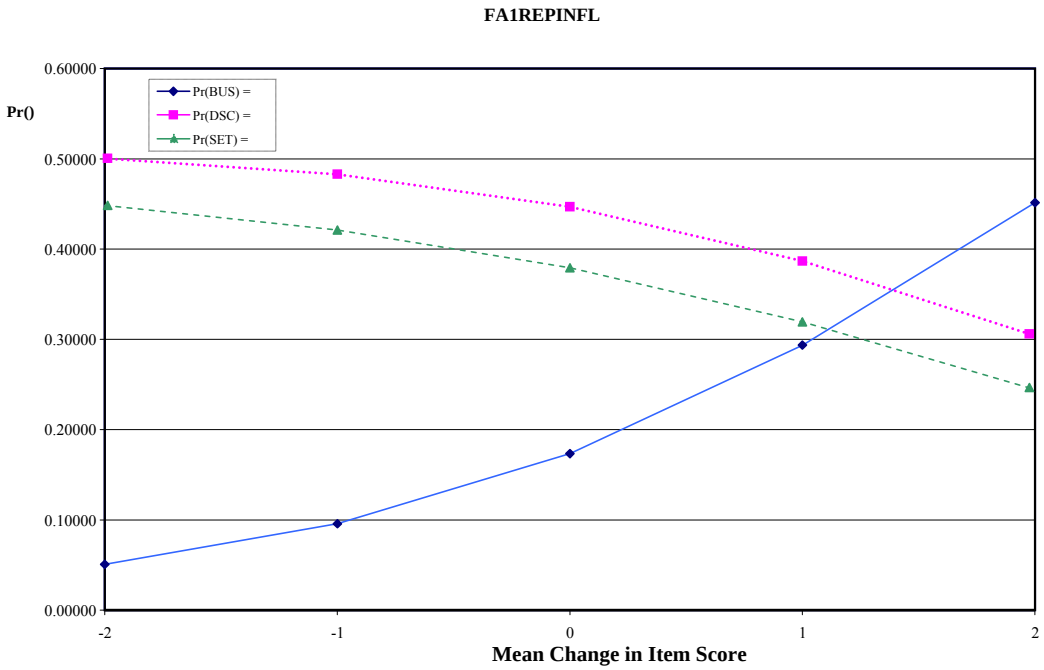


Table 6.15 depicts the changes as a result of the cross over effect in the rank ordering of the likelihood of group membership as values of reputation influence moves from a largely negative to a largely positive value.

Table 6.15: Changes in rank order of cross over effects for FA1REPINFL

Values	Largely negative ⟶	Largely positive
Ranking		
	1. DSC	1. Business
	2. SET	2. DSC
	3. Business	3. SET

Selection Criteria – Entry Influence

The results of Entry Influence simulation indicates as the values progress from largely negative (not *at all important*) to strongly positive (*extremely important*), a cross over effect reassigns the probabilities of classification from a student enrolled in SET to a student enrolled in DSC. Thus, as the selection criteria of Entry became more important as an influence upon the selection process, the likelihood of classification of enrolment in SET decreased as DSC likelihood steadily increased. At the same time the probability associated with classification of a student enrolled in Business remained relatively stable over the values for *FA3ENTRYINFL.*

Figure 6.2: Selection Criteria – Entry Influence *(FA3ENTRYINFL)*

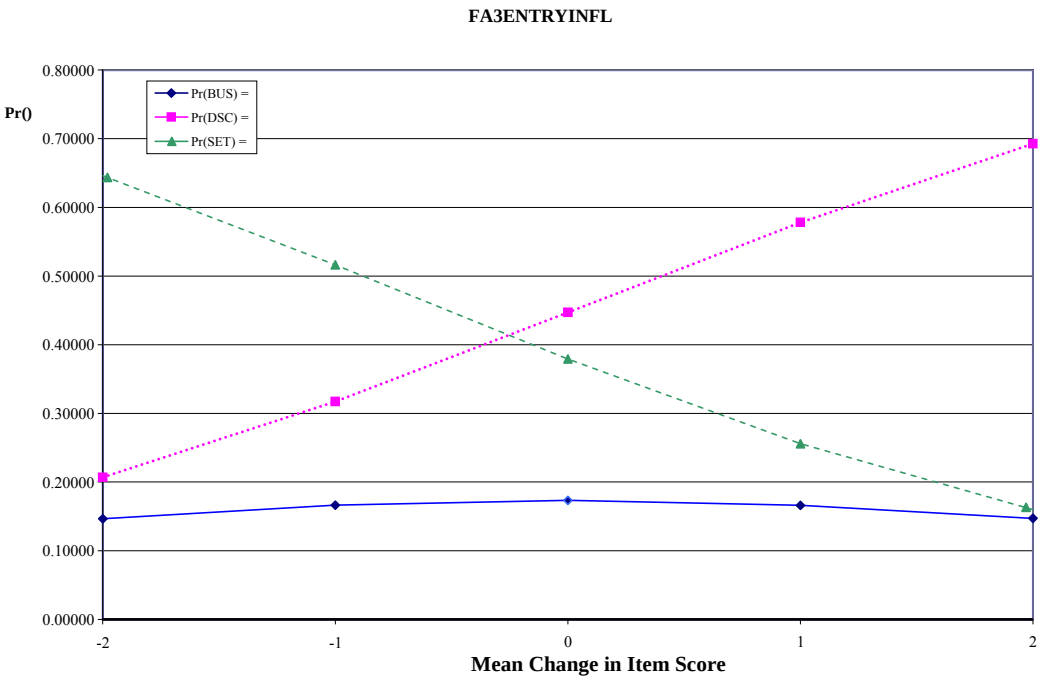


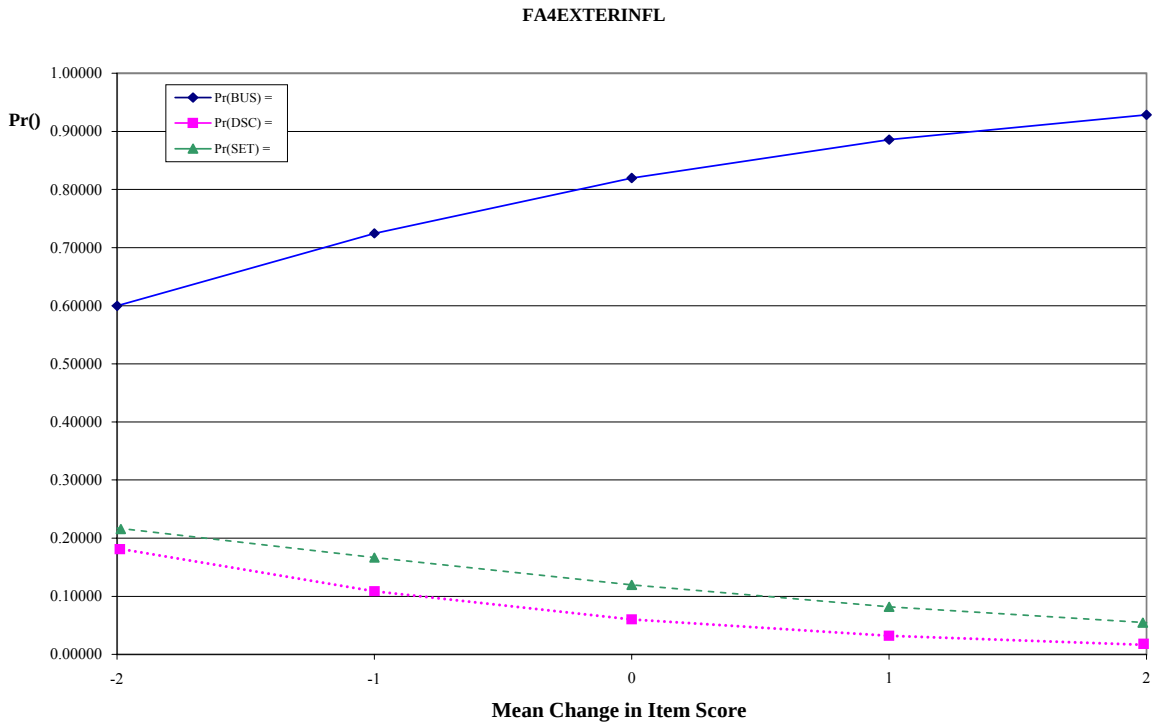
Table 6.16: Changes in rank order of cross over effects for Entry Influence

Values	Largely negative ⟶	Largely positive
Ranking		
	1. SET	1.DSC
	2. DSC	2. SET
	3. Business	3. Business

Selection Criteria – External Influence

The results achieved in this analysis are not only expected but also consistent with the constructed descriptive profile of a 'typical' student enrolled in the portfolios of Business; DSC and SET. The outcome presented in Figure 6.4 strongly supports the likelihood a student who considers 'external influence' as extremely important will continue to be a student enrolled in Business as the mean value towards F4SC_Externa moved from negative to large positive values. Simultaneously, the choice associated with considering F4SC_External as more important declines for students enrolled in both SET and DSC. Of relevance was to note the absence of a 'cross over effect' suggesting students surveyed were very clear as to which selection criteria was deemed important and relevant.

Figure 6.3: Selection Criteria – External Influence *(F4EXTERNAL)*



6.8.3 Simulation of Changes: Motivation

Motivation – Extrinsic Motivation

The result for Extrinsic Motivation depicted two cross over effects in a consequential shift of probability outcomes as values transit from large negative to large positive values At a very negative score where the value assigned to FAC1 M_Extr is "*not at all important*", the probability such a student is enrolled in DSC is very high (92%). In contrast, the probability such a student is enrolled in Business or SET is very low (2% and 5% respectively). Thus, as the level of importance towards extrinsic motives progressively increased, so does the probability such a student will be enrolled in either in SET or Business. At the same time, the probability for students enrolled in SET dramatically decreased.

Figure 6.4: Motivation – Extrinsic Motivation *(FAC1EXTR)*

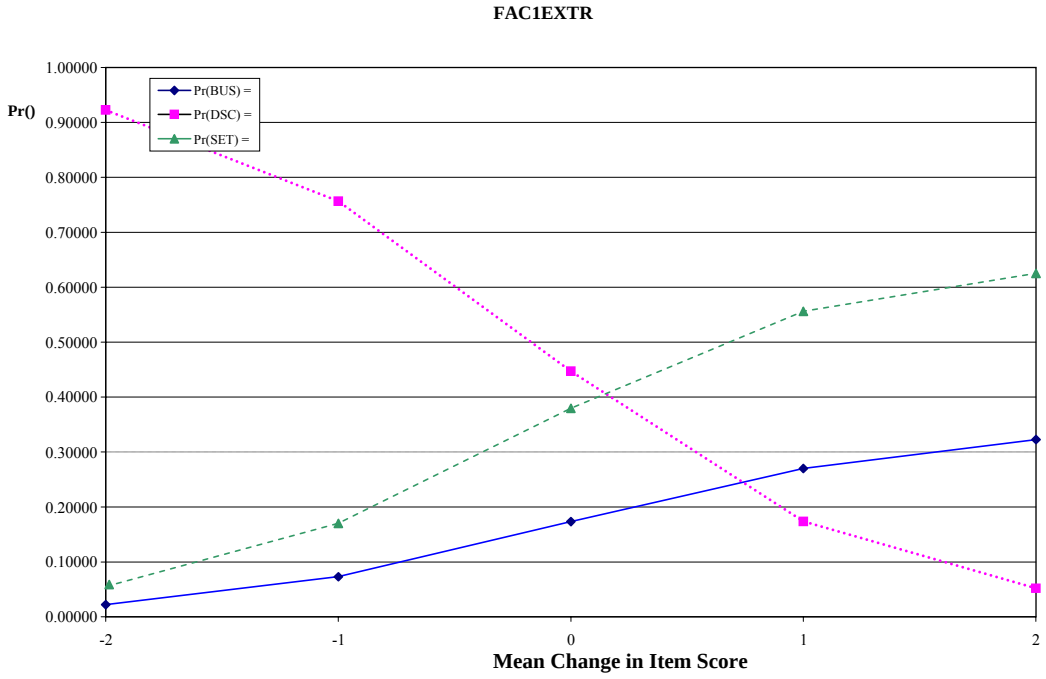


Table 6.17: Changes in rank order of cross over effects for FAC1 M_Extr

Values Ranking	Largely negative ⟶	Largely positive
	1. DSC	1. SET
	2. SET	2. Business
	3. Business	3. DSC

Motivation - Intrinsic Motivation

Three cross over effects characterises the change in the probabilities associated with the F3M_Intrins. As scores progressively shifted from largely negative values (not *at all important*) to strongly positive values (extremely *important*) so did the probabilities of prospective students choosing intrinsic driven statement as influencing reasons in pursuing higher education in a particular portfolio. As the Business curve started to decline, the first cross over effect occurred between Business and SET. As the portfolio of SET commenced a decline, the second and third cross over effect occurred as students enrolled in DSC take over both Business and SET, as the most likely group of students favouring intrinsic motives. The three cross over effects reaffirm the strength of probability associated with the strongly driven intrinsic motivation of students enrolled in DSC.

Figure 6.5 Motivation: Intrinsic Motivation *(FAC3INTRINS)*

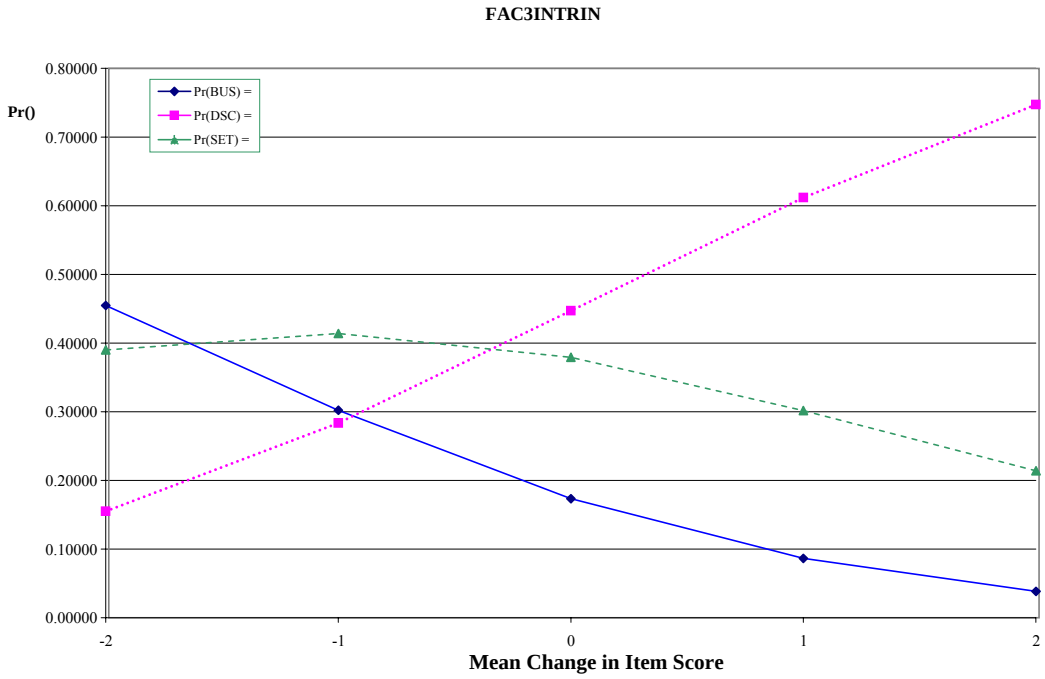


Table 6.18: Changes in rank order of cross over effects for F3M_Intrins

Values Ranking	Largely negative ⟶	Largely positive
	1. Business	1. DSC
	2. SET	2. SET
	3. DSC	3. Business

An overview of the ranking order of preferences is depicted in Table 6.19. The results support previous analyses illustrating choice behaviour towards a particular portfolio as the relative importance of an attributes shifts from largely negative values (*not at all important* to strongly positive values (extremely *important*). Students enrolled in Business and SET are motivated and act upon extrinsic motives which influences which attributes are deemed relevant and important. Similarly, students enrolled in DSC seek attributes compatible with their intrinsic motives for pursing a particular degree program.

Table 6.19: An Overview of changes in rank order of Derived Factor Scores

Construct	**Largely Negative ⟶ Largely Positive**	
Selection Criteria:		
Reputation Influence	DSC	Business
Entry Influence	SET	DSC
External Influence	DSC	Business
Motivation		
Extrinsic	DSC	SET
Intrinsic	Business	DSC

6.9 Summary of a Discrete Student Choice Model

A discrete student choice model is effective in predicting correctly almost 74% of the time the chance of prospective new students expressing preferences to selecting a particular portfolio to study in. The likelihood ratio of the model is highly significant (p =.000) suggesting an undergraduate students choice of behaviour of selecting a particular program, discipline and university can be well explained by this set of particular explanatory predictor variable.

Variables found to be significant in influencing preferences of which program and discipline to study include; a respondents' gender (p =.000), age (p =.000, and country of birth (p =.000. Whether a respondent is currently studying in the degree program of their choice was found to be significant (p =.000). Also found to be significant in was the respondent's father's occupation (p =.022); the mother's educational attainment level (p =. 016) and the parents level of combined income (p =.002).

Intrinsic (p =.030) and extrinsic motivation (p =.000) and the selection criteria of reputation (p =.000), entry (p =.026) and external influence (p =.020) were among the predictor covariates found to be significant in driving students' preferences and accounting for the variability in selecting a particular program and discipline. Although external values were found to be significant to the overall contribution model, these values did not appear to be statistically different amongst the respondents enrolled in the three portfolios.

The key empirical findings can be summarised a follows -

6.9.1 Business Portfolio

Prospective students are more likely to enrol in the Business portfolio than SET portfolio if:
Is of female gender
Falls in the 17-20 age category
Australian born
Father's occupation falls in a category other than 'Intermediate', such as 'Professional', 'Self employed' or 'Working'.
Currently enrolled in their preferred degree program
Considers *reputation* influences as important selection criteria when selecting expressing preference for a Business academic degree
Considers *external* influences as important selection criteria when selecting a university to pursue further studies
Allocates greater importance to extrinsic motives

6.9.2 DSC Portfolio

Prospective students are more likely to enrol in the DSC portfolio than SET portfolio if:
Is of female gender
Falls into the 21- 27+ age category
Born in Australia
Father's occupation falls in a category other than 'Intermediate', such as 'Professional', 'Self employed' or 'Working'.
Parents combined income is above $49 000 bracket
Mother's educational attainment is at least a postgraduate qualification
Currently enrolled in their preferred degree program
Considers *entry* influences as important selection criteria when selecting a university to pursue further studies

Chapter 7

DISCUSSION

7.1 Introduction

The previous chapters have investigated the underlying psychological drivers of the choice behaviour of undergraduate students. This chapter presents an overview regarding the interpretation of the models and a discussion of the analysis presented in the thesis. The purpose of this chapter is threefold. First, the chapter presents an overview of the results of hypothesis testing. Second, it reflects upon the contributions this thesis makes to the literature, both at a conceptual level and at a practical level in terms of the marketing implications. Third and final aim is to identify and suggest recommendations on opportunities for future research in this field of study.

7.2 Objective of the thesis

To attain the general aim of this thesis, two specific objectives stipulated are:

1. To empirically test causal processes underlying the observed relationship among variables to estimate the relative importance of alternative paths of influence between personal values, motivation and selection criteria of first year undergraduate students.

2. To test whether the effects of personal values, motivation, selection criteria and socio economic factors are significant in differentiating between student's choice of a degree program, discipline and university.

7.2.1 Hypotheses: An Overview

This thesis was predicated on the assumption the psychological constructs of personal values, motivations, selection criteria and demographic and psychographic variables drive preference behaviour in undergraduate students in their selection of a particular degree program at a particular university. It was argued personal values exert both direct and positive influence in terms of the level of importance students allocate amongst psychological constructs. Furthermore, once significant independent variables were identified, a discrete student choice model identified 'student types' explaining students' group membership.

Three sets of hypotheses were proposed:

1. The first set of hypotheses proposed an underlying causal relationship between the three drivers of personal values, motivation and selection criteria. Structural equation modeling supported three of the six hypotheses (refer Table 7.1).

Table 7.1: Hypotheses Set One – Structural Equation Modeling

H1a: There is a direct and positive relationship between internal values and motivation	Supported
H1b: There is a direct and positive relationship between internal values and selection criteria	Not Supported
H1c: That motivation will mediate the influence of values on selection criteria	Supported
H1d: There is a direct and positive relationship between external values and motivation	Not Supported
H1e: There is a direct and positive relationship between external values and |selection criteria	Not Supported
H1f: There is a direct and positive relationship between motivation and selection criteria	Supported

2. The second set of hypotheses proposed the likelihood of demographics and socioeconomic variables is related to a particular preference selection set. A series of non-parametric analyses supported seven of the nine hypotheses (refer to Table 8.2).

Table 7.2: Hypotheses Set Two- Descriptive Statistics Non- Parametric Tests

Hypotheses Set Two- Descriptive Statistics Non- Parametric Tests	
H2a: Gender is a factor in determining a student's particular preference selection set	Supported
H2b: Age is a factor in determining a student's particular preference selection set	Supported
H2c: Country of Birth is a factor in determining a student's particular preference selection set	Supported
H2d: A mother's particular educational levels is a factor in determining a student's particular preference selection set	Supported
H2e: A father's particular educational levels is a factor in determining a student's particular preference selection set	Not Supported
H2f: A mother's occupational status is a factor in determining a student's particular preference selection set.	Not Supported
H2g: A father's occupational status is a factor in determining a student's particular preference selection set.	Supported
H2h: Parental combined income levels are a factor in determining a student's particular preference selection set	Supported
H2i: A student's first preference is a factor in determining a student's particular preference selection set	Supported

3. The third set of hypotheses proposed the likelihood of psychological constructs being positively associated with student's particular preference selection set. A discrete student choice model did not support the first hypothesis, gave partial support to the second, and showed support for the third hypothesis (refer Table 7.3).

Table 7.3: Hypotheses Set Three - Multinomial Logistic Regression

Hypotheses Set Three - Multinomial Logistic Regression	Not Supported
Ha3: Students' choice of personal values as underlying drivers will be positively associated with a student's particular preference selection set	
H3b: Students' motivation as underlying drivers will be positively associated with a student's particular preference selection set	Partial Support
H3c: Students' choice of selection criteria as underlying drivers will be positively associated with a student's particular preference selection set	Supported

7.3. The Contribution of this Thesis

This section contemplates contributions both on an academic level towards the field of consumer behaviour and marketing literature and on a practical marketing level through proposing a conceptual model for developing marketing strategies.

7.3.1 Contribution to the Theory of Choice Behaviour

A critical review of literature pertaining to choice behaviour revealed research identifying a set of the most important selection attributes has predominated past literature. As a result, marketing and behavioural researchers have become consistent in terms of ranking important and relevant attributes. Although research has looked beyond selection criteria and identified a number of other variables that influence choice behaviour, only a few studies have taken on an approach to examine underlying drivers for an in-depth understanding of choice behaviour. Two underlying dimensions appear to emerge from past literature, those of *external and internal* constructs as drivers on choice behaviour. *Internal drivers* comprise of among other things, the psychological constructs of personal values, motivation, personality types, and interest, perception and selection criteria. *External drivers* are broadly captured by demographic and socio economic factors. Acquiring knowledge of what influences selection preferences effectively empowers educational marketers to designing relevant marketing strategies. This thesis extends an understanding of and provides invaluable insight into the pathways of influence and relationships between 'student types' and their choice behaviour by introducing the constructs of *personal values, motivation, selection criteria and demographic and socioeconomic* as influential drivers.

This thesis is therefore significant because through the development of a conceptual model, it has both acknowledged and addressed this gap in the existing literature on choice behaviour. Through proposing a conceptual model, this thesis uniquely addresses in an educational context that personal values directly influence motivation and that motivation directly influences selection criteria and alternatively, personal values influence selection criteria indirectly via motivation mediating this pathway. Furthermore, a causal methodology, has offered an innovative approach to investigating the drivers of choice behaviour through the construction of a hierarchy model and a discrete choice student model. Developing 'student profiles' facilitates marketers to customise integrated marketing communication campaigns reinforcing the appeal to students who for example are strongly extrinsically or intrinsically driven. Appealing to relevant attributes of the program and university increases the likelihood of attracting and retaining the 'right student type' most suited to the degree program offered.

Another important contribution is the development of a measurement instrument designed to capture the specific domains of the nine List of Values (LOV) applied in an educational context. The application of statements to better define the construct measured has been typical in LOV research (Kropp et al. 2005; Desiderato et al. 2002). The exploratory research entailed a two phase approach to scale development for the measurement instrument. Sample item generation involved exploring the perceived meaning of the underlying nine LOV constructs through a qualitative type survey. Early validation of the measurement instrument through pre-testing constituted the second phase. The internal consistencies of the subscales were assessed with the use of Cronbach's α for each of the two indices (.849 and .792) exceeded the 0.70 criteria (Nunnally 1994) therefore demonstrating acceptable scale reliability.

7.3.2 Contribution to the Understanding of Student Profiles

The thesis clearly indicates students enrolled across the three portfolios fundamentally exhibit a particular set of demographics and socioeconomic characteristics typical of that particular cohort. The key findings of the analysis suggested an undergraduate student's choice behaviour appears to be significantly influenced by their age, gender, country of birth; the occupational status of their father, the educational attainment of their mother, combined family income and whether they are enrolled in their first preference for a degree program.

The results also indicated the influential role gender plays in a student's preferential choices of which particular program to study and discipline. Gender discrepancies were most apparent in the portfolios of DSC and SET. Statistical differences were evident in the scores for personal values, motivation and selection criteria for male and female students. Translated into 'student types', for example, students who express a preference for degree programs in the Business portfolio were more likely to be female school leavers enrolled in a degree program of their first choice. Female respondents were also more likely to go into higher education for academic motivational reasons, such as 'enjoying a course' adding support to Whitehead's et al. (2006) study. Being a mature aged female student also increased the likelihood of expressing a preference to enrol in DSC.

For students enrolled in SET, there was more of a likelihood of such a student being born overseas and male compared to the other two portfolios. Furthermore, students enrolled in SET differentiated themselves more on socioeconomic variables as their demographic profile closely mirrored the characteristics of students enrolled in Business. Also students whose both parents are professionally employed were more likely to express preference to undertake a Business degree, followed by a degree program offered under DSC compared to a degree program offered under SET. However, students whose mother qualified at a postgraduate level of education were more likely to prefer to enrol in DSC than SET. Parental combined income was deemed differentially important in comparisons between students enrolled in DSC and SET.

7.3.3 Contribution to the Understanding of Causal Relationship

The conceptual model proposed a pathway of influence as a vehicle for investigating choice behaviour. The hypotheses proposed were tested through a quantitative approach by two distinct but mutually supporting stages in research analysis; that of a hierarchy model and a discrete choice model. The hierarchy model (Homer and Kahle 1988) was tested by a structural equation model (SEM) for the significance of the relationships between particular pairs of variables. In contrast to other applications of a hierarchy model applied to investigate relationships amongst psychological contrasts (Homer and Kahle 1988), the constructs of *personal values, motivation and selection criteria* introduced for this thesis have not been previously applied in a hierarchy model, nor has a hierarchy model been applied in an educational context.

The first set of hypotheses proposed three fundamental causal relationships between the three drivers of personal values, motivation and selection criteria. The empirical outcome of this thesis provides statistical evidence that the proposed pathway influences depicted structural equation model is plausible. The structural part of the model indicated several significant relationships, some of which are consistent with prior research. Other relationships posed contribute to the current understanding of relevant psychological constructs and their influencing student' choice behaviour.

Consistent with prior research (Homer and Kahle 1988):

- There is a direct and positive relationship between internal values and motivation.

- Internal personal values had only an indirect effect in influencing which selection attribute prospective students deem important in their choice behaviour.

- Motivation has a mediating effect upon the selection criteria attributes in the proposed model.

Internal personal values had only an indirect influence on students' selection criteria via motivation. In other words, the construct of motivation took on a mediating role between the more abstract values and the more specific selection criteria attributes. This hierarchical flow of pathway influence from the abstract values to the more specific behaviours in an educational context lent support to Homer and Kahle (1988) argument that values have only an indirect effect on behaviour mediated through 'domain specific attitudes'.

Contribution to understanding of causal relationship in an educational context:

- The internal values of s*elf fulfilment; self respect; sense of accomplishment; and excitement* were significantly related to both *intrinsic and extrinsic motivation.*

- There is a direct and positive relationship between motivation and selection criteria. Extrinsic and intrinsic driven motivation was significant in influencing which selection criteria attributes prospective students deem important and relevant when considering the choice of program, discipline and university.

- The selection criteria observed variables of *reputation influence; academic influence, external influence and entry influence* were instrumental in directing preferences of degree program, discipline and university.

- External values did not appear to be playing an influential role on either motivation or selection criteria, evident from the non-significant pathways between these latent constructs

- Motivation is represented by an intrinsic and extrinsic orientation.

The top five motivation for all students across the three portfolios comprised of four items of extrinsic motivation and one item of intrinsic motivation. Of the four selection criteria factors, the influence of *reputation* of the 'university' and the 'degree course' and *external* influence of 'job opportunities' were deemed the most important by all students. This outcome supports the two latent constructs of intrinsic and extrinsic motivation depicted in the structural equation model. Furthermore, upholding a two-factor measurement motivation model is the inconsequential impact of amotivation as an important influencing factor. A two-factor measurement motivation model substantially improved through excluding the 'amotivation' construct {(χ^2 (8) 120, p=.000) as noted by the drop in RMSEA .083 to .058.}. In fact, not one amotivational reason was listed in any of the top five motives across all three portfolios. The removal of the amotivational construct from the measurement model was also consistent with the descriptive analysis. Amotivation scores were very low across all portfolios, and in fact the amotivation motive of *I don't want to get a job yet* (M=2.940 SD=1.768) rated as the least important motive across all the 304 students lending support to prior research (Fazey and Fazey 2001). In other words, students surveyed for this thesis clearly understood the reason behind what motivated them to enrol in a particular degree program.

Accordingly, the findings of this thesis confirm prospective students who placed greater emphasis on the values of *self fulfilment*, *self respect, sense of accomplishment and excitement* were also shown to be highly motivated in seeking selection attributes that facilitate attaining their preferred degree program in their preferred discipline and preferred university. Moreover, results of this thesis suggest a student's motivation, that is what impels them to act, is directly influenced by their internal values. Students whom affiliated strongly with internal values also indicated a tendency to be either strongly intrinsically or extrinsically motivated to pursing a particular degree course. Therefore, conceptually, the results of this research point towards a cohort of first year undergraduate students who are clearly very driven in their pursuit of expressing preferences towards a particular program and discipline. This appears to hold true as internal values are rated highly by those individuals who believe they can influence or control outcomes. According to Madrigal (1995) internally oriented individuals tend to feel more self motivated. At opposing ends of a spectrum, externally oriented individuals tend to abdicate responsibility to others, resulting in a sense of powerlessness whereby external forces govern solutions to problems. Furthermore, external values generally require the presence judgments, or opinions of others (Kropp et al. 2005).

7.3.4. Contribution to the Understanding of the Variability in Choice Behaviour

The discrete student choice model attributed choice behaviour to the psychological variables perceived different by cohorts of students when considering the choice of a preferred program, discipline and university. The variability associated with the relative importance students allocate to particular drivers amongst students' preferred choice of a particular portfolio was well explained and predicted through the application of the discrete student choice model. In other words, on the basis of both factors and coefficients, MLR was effective in predicting a 'student type' well suited for undertaking a particular degree program in a particular discipline. This was illustrated through the application of the student choice model based on average values. On the basis of a set of psychological constructs and demographic and psychographic factors, a 99.99% accuracy rate was obtained for a student enrolled in Business, and a 99.71% accuracy rate for a student enrolled in DSC and an accuracy rate of almost 75% for a student enrolled in SET. Thus, the student choice model was outstandingly effective in predicting classification for students enrolled in both Business and DSC; however it was still a satisfactory model for students enrolled in SET.

Importantly, the discrete student choice model validated results emanating from both the descriptive analysis and the structural model. The *internal* variable of personal values, motivation and selection criteria and the *external* variables of demographic and socioeconomic variables introduced in this thesis effectively provided an insight into underlying determinants of choice behaviour. Analysis results clearly indicated a potential applicant's demographic and socioeconomic variables of gender, age, country of birth, the degree program of first preference, father's occupation, the mother's educational attainment level and the parents level of combined income were identified to be statistically significant in distinguishing between portfolios given that other factors and coefficients are included in the model.

In terms of testing significant pathways in the structural equation model, internal values as a psychological drivers had a positive and direct relationship to motivation and an indirect relationship mediated by motivation to selection criteria. A discrete student choice model identified internal values not to be statistically different amongst the respondents enrolled in the three different portfolios. This outcome logically tied to and reinforced the descriptive analyses which suggested the internal dimension of personal values were relevant and deemed important by *all* respondents. The importance of internal values flowed through to the hierarchy model which indicated both the positive direct and indirect effects upon the other psychological constructs.

External values also did not appear to be statistically significant amongst the respondents enrolled in the three different portfolios. More specifically, although external values were found to be significant to the overall contribution of the student's choice model, as underlying drivers did not play an influential role on either motivation or selection criteria, evident from the non-significant pathways between these latent constructs.

A student's motivational orientation, be it intrinsic and extrinsic motivation was among the predictor variables found to be significant in driving students' preferences. A discrete choice model also suggested these two types of motivational orientation were statistically significant in distinguishing between portfolios. Although the hypothesis testing confirmed a negative, not a positive relationship, lending only partial support to the hypotheses, the result was nevertheless consistent with prior findings. Students who consider intrinsic motivation as an important driver were less likely to prefer to enrol in Business than SET;

students who consider extrinsic motivation as an important driver are less likely to prefer to enrol in SET than DSC.

The selection criteria of reputation, entry and external influence were considered to be statistically significant in distinguishing between portfolios. Hypotheses testing confirmed a positive relationship between a student's choice of selection criteria and a particular preference set. Students across all three portfolios overall perceived academic reputation and academic quality for both the university and the programs offered as *extremely important*. By the same token, career related concerns were also strongly emphasised and highly rated on level of importance. In general, these outcomes are consistent with the findings of Soutar and Turner (2002) and Veloutsou et al. (2004). Future career prospects and opportunities following degree completion from the university are also judged of the utmost importance (McInnis et al. 2000). Undergraduate students aspire to attain the economic advantage of a university degree (Whitehead et al. 2006) though profitable employment and career prospects related to their chosen degree program studied. Course and institutional reputation (Moogan and Baron 2003; James et al. 1999) were considered of importance by prospective students when making their selection, thus supporting Chapman's (1986) notion of the relevance of academic quality as 'unquestionable' in the selection process.

The attributes considered least important to all students related to university infrastructure and resources as (library, computer labs, and/or classrooms) and recreational facilities. In contrast to Chapman's (1982) findings, significant persons were not judged as an important external influencing factor by students in their selection process. This outcome is also opposing to the findings of Krause et al. (2006) who observed a notable in increase in the percentage of students who say that 'expectations of my parents or family' is an important reason from their 1994 to 2004 study. Location of the university was considered as one of the top five selection criteria. Almost 15% of all students in the population were full fee paying international students. Approximately a third of international students (26.5%) reported the selection criteria of both *location* and *entry requirements* as "*extremely important"* (M=6.50) and "*important*" (M=5.50) respectively.

The results of this analysis indicates a similar trend to past research (Krause et al. 2005), in that prospective undergraduate applicants have clear in their mind the reasons for enrolling and the occupation they ultimately seek. As a cohort these students are motivated to seek

out the attributes they consider relevant and important when expressing their preferences of a degree program and university**.** Accordingly, students who consider reputation as a strong influence in their selection criteria are more likely to prefer to enrol in Business than SET; students who consider external influences as a driver on their selection criteria are more likely to prefer to enrol in Business than SET, and; students who consider entry influences as a driver on their selection criteria are more likely to prefer to enrol in DSC than SET. Academic influence was not considered statistically significant in distinguishing between portfolios.

Simulation analysis of the discrete student choice model facilitated an in-depth understanding and insight of 'student types'. The analysis demonstrated the effect of changes of a given derived factor variable, on the probability of correctly predicting students' group membership**.** For example, in this case of the selection criteria factor of *reputation,* as values scores transit from largely negative (*not at all important*) to strongly positive (*extremely important*) the probability of being a classified as a student enrolled in DSC and SET steadily decreased, while the probability of being classified as a student enrolled in Business steadily increased. A clear cross over effect occurs when students enrolled in Business 'take over' students in both DSC and SET as the most likely students whom allocate particular importance to the selection criteria of 'reputation' influence.

7.4 Recommendation in terms of Marketing Strategy

Findings from this thesis suggest undergraduate students should not be treated as a homogeneous market. More specifically the strategic implications are that positioning of academic programs and universities should be recognised and differentiated at a macro and a micro level. Through evaluation of 'student types', the customisation of marketing strategies occurs on a macro competitive level as to how the university can attract, retain and sustain the vast undergraduate market and on a more micro level through degree program offerings.

7.4.1 University Level

Personal *values* exert a direct and positive influence upon *intrinsic and extrinsic motivation*, which then mediated an influence upon a student's selection criteria. Howard

and Woodside (cited in Pitts and Woodside 1983) contend that consumers can be grouped according to the degree of similarity of their value systems. Furthermore, an awareness of the value orientations held by a specific group may help in understanding, explaining, or perhaps predicting subsequent attitudes and behaviour (Munson and McIntyre 1978). As previously discussed, attracting and retaining suitable students is a key objective of any university. In the case of this thesis, the findings of the results chapters indicated that all students across the different portfolios and enrolled in different programs showed strong agreement upon a common set of values.

More specifically, 80% of the personal values preferred by all students currently enrolled were categorised under the 'internal' value dimension. The values of *self fulfilment*, *self accomplishment, fun and enjoyment in life*, and *excitement* were deemed of importance and relevance. Those who rate internal values as important and of relevance do not require the judgements or confirmation through the opinion of others. In accordance with this, students across the three portfolios in prioritising their selection criteria indicated the external influence of 'family opinion' as exerting the least importance.

Acknowledgement of the personal values significant in influencing choice behaviour at a university level is likely to allow educational marketers to communicate distinct benefits aligned with what prospective applicants are seeking to fulfil. The results of this thesis show students identified with the following top five statements of internal personal values.; '*It is important to feel happy with yourself and where you are in life'; 'Finishing something makes me feel content and satisfied'; 'Doing things for myself which makes me happy is important to me; 'It is important to have a sense of dignity about one self';* and '*It is important to me to look forward to something'*. The causal flow of internal personal values towards motivation in an educational setting suggests that universities can positively influence student choice behaviour by developing marketing strategies directed at appealing to the internal values of self fulfilment, self accomplishment; self respect; fun and enjoyment and excitement. Therefore, promotional themes incorporating these values are likely to maximally enhance the appeal of a university to particular prospective applicant in better matching of students, and programs offered at that university.

It is then, at a university level, that promotional elements of the marketing mix recognising important values prospective students hold in pursuing higher education can positively influence their choice behaviour. These internal values will in turn have a direct and

positive effect on a prospective student's motivation, as well as an indirect influence on the selection criteria deemed relevant and important. Similarly, Muller (2001) proposed that acknowledging relevant values in promotional themes should make a particular destination more desirable to a particular segment. A marketing strategy positioned at the portfolio level is discussed in the next section.

7.4.2 Portfolio Level

Conceptually, the results of this research point towards a cohort of first year undergraduate students who are both intrinsically and extrinsically stimulated to act. The hierarchy model clearly showed the orientation of a student's level of motivation is a pertinent driver in the choice behaviour towards preference for a particular degree program. The outcomes suggest the different cohort of students have very clear reasons as to what motivated them to choose a particular preference set. The discrete student choice model was effective in predicting classification of students enrolled in Business and DSC in comparison to students enrolled in SET through a set of 'student types'.

In comparing the three cohorts of students, those enrolled in Business and DSC reflected distinctive characteristics in terms of their profile and their psychological constructs. For example, Business students majoring in Economics and Finance, International Business, and Accounting are professions that have traditionally identified with males (Goyette and Mullen 2006). However results from this thesis have recognised the consideration by female students in expressing preferences to enrol in the Business portfolio. At portfolio level, an integrated marketing campaign to capture and attract prospective undergraduate students should integrate and reflect these profile types. The risk otherwise is to discourage application by prospective female students who may not identify with the positioning for particular degree programs within a particular discipline.

Students enrolled in SET portfolio indicated some distinctive characteristics; however shared a common set of underlying psychological constructs (refer to Table 6.14), to Business compared with DSC and SET. In other words, Science and Engineering applicants similar to Business applicants shared a common set of values and motives and what selection attributes they deemed important. Students enrolled in both Business and SET were distinctly extrinsically driven to securing a clearly defined goal. Moreover, the results indicated strong vocationally oriented motives impelled this cohort of students to enrol in particular degree program and discipline. Given motivation was significant in

influencing which selection criteria attributes prospective students deem important and relevant, this cohort of students accordingly displayed similar attributes. The motives that impel students to act are also instrumental in not only influencing, but differentiating amongst students as to which selection criteria are deemed important. It can therefore be assumed students who express a preference for a particular program and discipline that appeals to their underlying motivational orientation will posses the impetus to strive to achieve their goals through completing their degree program. For example, the impetus for Business applicants was the strong influence of 'employment rates', 'institutional image and prestige', and 'reputation' of both the degree program and the university. In contrast, students enrolled in DSC were distinctly intrinsically driven expressing this motive through attributes focusing on the degree programs 'reputation' and suitability.

Accordingly, on a portfolio level, specific communications strategies can be offered for the two cohorts of Business and DSC identifying the desired outcome sought by each student cohort. Given the underlying similarities in terms of underlying psychological drivers among students enrolled in Business and SET portfolio, an integrated marketing campaign designed for Business would also be effective in attracting applicants for the degree programs offered in SET. Thus, promotional efforts designed to appeal to motivations of and provide information for important choice criteria will be instrumental in attracting a viable and sustainable marketing segment. An overview of a marketing approach is proposed below.

7.4.3 Business/ SET Portfolio

For students enrolled in the Business and SET portfolio, the results indicate these students are overwhelmingly extrinsically motivated and driven in pursing a higher education degree. The only point of differentiation between Business and SET was the intrinsic motivation of *I want to become a better educated person* entering as fifth consideration in the SET portfolios top five motives. As in the other two portfolios, universities resources and facilities rated very low in terms of importance as did *family opinion.* Facilities also did not rate very highly as important attributes although Engineering students are by far the most frequently daily users of technology as email.

In expressing their first consideration in preference selection once they made a decision to enter in to higher education, almost 52% of students enrolled in the Business portfolio

reported *university*, followed by *program* consideration at 33% and *discipline* at 15.5% which ranked last across all portfolios. In other words, students currently enrolled in Business gave first consideration to the university of their preference, and then the specific degree programs offered at that particular university and lastly the discipline. For students enrolled in SET, 47% of students indicated precedence to the *degree program* followed by 37% consideration to the *university*. However as noted by James et al. (1999) the process in which students engage in evaluative choices pertaining to the order of choice, tends not to be a linear process, but an iterative process.

First year undergraduate students have very clear motives for enrolling in a Business degree and a degree offered under the SET portfolio. What is deemed very important to this cohort of students is clearly the achievement of a 'means to an end'. For both cohorts of students, the attainment of a goal translates to *getting a degree* which will allow [the respondent] to get a *prestigious job* and in *the job I want* to *earn more money* and to *follow my chosen career.* An extrinsically motivated student is primarily concerned with material, social or symbolic rewards (Kinman and Kinman 2001). Byrne and Flood (2005) concur asserting extrinsically motivated students engage in learning purely to achieve an external goal. Therefore, positioning a degree program offered under both portfolios will demand communication of extrinsic rewards and the efficacy of the university to operate as a vehicle for attaining such goals. As the construct of motivation directly influences the selection criteria of prospective students, the factors of 'reputation' influence and 'external' influence of both the degree program and the university must align with the attainment of extrinsic end goals. These outcomes suggest an integrated marketing communication strategy directed towards both cohorts of students should essentially reinforce the 'reputation', 'prestige and statuses' of the university and of the degree program.

7.4.4 DSC

First year students enrolled in DSC were predominately intrinsically driven to pursuing an undergraduate degree. For this cohort of students, the underlying motivation to enrol at a university is the participation and engagement in education for the desire to learn. Findings by Kimweli and Richards (1999) add some insight into this intrinsic motivation. The study examined the interrelationships of students' choice of an Art major, selection of a career, and a student's perception of art as improving quality of life. Results suggested as students

mature, they tend to appreciate their major of Art and to perceive their major in Art as improving their quality of life.

Therefore, positioning degree programs offered in DSC will demand predominately communication of intrinsic rewards, such as engaging in learning out of curiosity, interest or enjoyment. Further, students enrolled in DSC support the findings by James et al. (1999) that indicate students studying the Arts are less vocationally focused and also less influenced overall by specific institutional characteristics. Although less vocationally focused, careers and future job prosperity was also of relevance to these students.

Almost 44% of students indicated the program was their first consideration, followed by consideration for the university at 26%. Accordingly, emphasis on reputation influence shifts to the degree program and the course suitability rather than the university per se. This outcome is consistent with the preference selection of program offered as first consideration for DSC students once they made a decision to enter into higher education. Furthermore, the selectiveness of a course at a university for some students may also enhance the attractiveness of a particular degree course. Similar to Business students, this cohort places less importance in what a university has to offer in terms of infrastructure resources as (library, computer labs, and/or classrooms) and recreational facilities. The external influence of "family opinion" exerts the least importance in prioritising their selection criteria.

This thesis found that prospective students did not tend to persist with lower order preferences indicative of their first preference. Harvey-Beavis and Elsworth (1998) suggestion of influencing of enrolment patterns in terms of 'clusters of courses' would only be relevant for students enrolled in DSC. This cohort of students appeared to be driven by the interests of their first preferences to lower order preferences.

7.5 Limitations and Implications for Future Research

Through the interpretation of results and acknowledgement of limitations, the thesis has identified a number of opportunities all of which suggest directions for future research.

First, through the development of a hierarchy model and a discrete choice model, this thesis has proposed a comprehensive and innovative approach in investigating the constructs influencing a student's choice behaviour. In contrast to other applications of a hierarchy model, the psychological constructs of *personal values, motivation and selection criteria* proposed in the model for this thesis have not been previously introduced in a single model, nor has a hierarchy model been applied in an educational context. Importantly, this thesis has provided a platform for further application of the proposed models to investigate the influence of the introduced psychological constructs in terms of the importance students attach in comparable educational contexts. To do so, will facilitate continual refinement of the three measurement scales proposed.

However, although the conceptual framework proposed an approach to understanding drivers of choice behaviour; it is by no means a comprehensive model. Other psychological constructs identified by prior research as relevant and pertinent in investigating influences may be as effective in explaining choice behaviour. Clearly students are driven by their motivational orientation however; future research can consider investigating other pertinent constructs in the role of mediators upon other relevant constructs.

Second, the sample from which the research is based is drawn from a specific university therefore preventing generalisation of these findings to a broader context. Although one advantage may be the population as a cohort may exhibit similar generic characteristics, the implication could also be results may differ given other institutional contexts (Worthington and Higgins 2004). Building on findings from this thesis, there is the direction of comparing faculties that share common degree programs. For example, as comparing enrolled students within a Business faculty across other universities. There is no way of knowing without further study to predict if the significant 'student types' emanating from this sample are representative of samples from other universities. As a recommendation for future research, it would be advantageous and useful to broaden the scope of the sample to include other universities with similar faculties and repeat the same study.

Third, the thesis did not distinguish between degree programs within a particular portfolio in the analysis. The assumption that respondents are alike within a portfolio could be further considered. There is a possible future research avenue of investigating the variability that may exist within a portfolio offering different degree programs. For example, the portfolio of SET at RMIT University offers a broad number of degree programs across different disciplines. A re-examination of only the SET portfolio may provide a better understanding as to why the discrete student choice model was a less impressive model for predicting students enrolled in SET.

Fourth, the undergraduate market is one of the largest and most profitable segments within universities. Although international students are also a recognisable portion of the undergraduate market, as a group were not adequately represented by this sample. As international students may allocate a different level of importance to personal values, motivation and selection criteria, a future recommendation would be to ensure such constituents of the undergraduate market were well represented.

7.6 Conclusion

Undergraduate students as a cohort are recognised as a relevant and important segment by tertiary institutions, but few studies have taken on an approach to examine underlying drivers for an *in-depth* understanding of choice behaviour. This thesis extends an understanding of and provides invaluable insight into the pathways of influence and relationships between 'student types' and their choice behaviour by introducing the constructs of *personal values, motivation, selection criteria, demographic and socioeconomic* variables as influential drivers. This thesis is therefore significant because through the development of a conceptual model, it has addressed this gap in the existing literature on choice behaviour. By developing a causal methodology for investigating the drivers of choice behaviour within a conceptual model, important and timely contributions resulted at both an academic and marketing level.

Application of analysis techniques from descriptive to causal yielded a consistent outcome in terms of identifying significant internal and external predictor variables. Undergraduate students' choice behaviour as to which academic degree program, discipline and university is influenced by their gender, age, country of birth, preference of degree program, father's

occupation, mother's educational attainment level and the level of their parents combined income. Furthermore, this thesis demonstrated a hierarchical relationship amongst the proposed psychological constructs and identified significant predictor variables. The internal variable of personal values, motivation and selection criteria introduced in the conceptual model and tested by a structural and a discrete choice model were identified as significant drivers of choice behaviour. In terms of hierarchical relationships, internal personal values directly and positively influenced intrinsic and/or extrinsic motivation; however this influence on the selection attributes of reputation, academic, entry and external influence was mediated though motivation. Internal personal values had only an indirect influence on students' selection criteria via motivation when seeking a particular degree program and university. Therefore, although personal values have acted as influential predictors of behavioural outcomes (Homer and Kahle 1988) in prior studies, application of a hierarchy model in an educational context to assess the level of importance students allocate to these psychological constructs indicated it was a student's motivational orientation and not the direct influence of their personal values that was instrumental in influencing the selection attributes relevant to choice behaviour. For that reason, an awareness of a student's motivation and how that orientation be it intrinsic or extrinsic manifests itself in terms of influencing the importance and relevance of selection attributes for a particular degree course is of *noteworthy relevance* for marketers.

Additionally, the development of a discrete student choice model provides marketers with an invaluable insight into 'student types'. As to how psychological constructs explain significant levels of variability in student's choice of degree programs and universities for the same attribute provides an important understanding of choice behaviour. For example, prospective students who are currently enrolled in the Business portfolio deemed reputation and job opportunities as a relevant selection criteria and this was reflected by the strongly positive importance scores allocated on the SCIS. Therefore to attract prospective undergraduate students to enrol in the Business portfolio emphasis must be directed towards the career and monetary advantages of obtaining a degree. Likewise, the status and privileges enjoyed by Business graduates in the employment market would be an appropriate positioning angle. For students currently enrolled in DSC, job opportunities was also identified as one of their 'top five' selection criterion. However, the variability in the level of importance allocated to this attribute explained the differentiation existing between the cohorts. Students enrolled in DSC differed in their priorities from students

enrolled in Business and SET as this cohort of students were predominately intrinsically driven and less vocationally focused.

As a cohort, undergraduate first year students currently enrolled across the three portfolios of Business, Design and Social Context; and Science, Engineering and Technology are motivated to seek out the attributes they consider relevant and important when expressing their preferences of a degree program and a university. Their choice behaviour is characterised by the interaction of a number of influencing attributes. However, they have clear in their mind the reasons for enrolling and the occupation they ultimately seek. Armed with this insight, educational marketers can effectively utilise these predictors of preferential choice behaviour for strategy development. Implications for marketing in higher education wishing to recruit the 'right type of student' to suit the programs offered, must customise different integrated marketing communication campaigns to target segments. Clearly, there is no long term gain for universities in attracting students better suited to other degree programs. Accordingly, in terms of designing marketing strategies, the contribution of this thesis facilitates an *in-depth* understanding of significant drivers influencing choice behaviour, which becomes considerably relevant in appealing to and retaining the students most suited to particular academic programs and universities.

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Appendix A1 - Plain Language Statement: Qualitative

RMIT BUSINESS

Dear Student

You are invited to participate in a research project being conducted by the School of Economics, Finance and Marketing at RMIT Business. This information sheet describes the project in 'plain English'. Please read this sheet carefully and be confident that you understand its contents before deciding whether to participate. If you have any questions about the project, please ask one of the investigators. You may choose not to participate.

Who is involved in this research project? Why is it being conducted?

The investigator is a PhD student enrolled in a PhD degree by research in Marketing in the School of Economics, Finance and Marketing. The investigator is also a lecturer in Marketing in the School of Economics, Finance and Marketing.

The supervisors for this research project are:

- Prof Tim Fry (Director of Research) Economics, Finance and Marketing, RMIT University tim.fry@rmit.edu.au 99251478
- Dr. Raju Mulye (Senior lecturer) Economics, Finance and Marketing, RMIT University, raju.mulye@rmit.edu.au 99255561
- Dr. Christopher Ziguras (Senior Research Fellow) PVC Design & Social Context Global Studies, Social Science & Planning christopher.ziguras@rmit.edu.au

The research is conducted to investigate the decision making process of first year undergraduate students in a higher educational context.

Why have you been approached?

Your cohort has been randomly selected from a population pool of first year undergraduate students enrolled in this particular portfolio.

What is the project about? What are the questions being addressed?

The project involves identifying and understanding the reasons underlying a student's selection criteria when choosing to study at a particular university and in a particular faculty and program

The underlying objective of a group discussion is to explore and translate a set of value domains from LOV (List of Values) into statements and or words from an undergraduate student perspective.

The investigator anticipates receiving feedback from all respondents participating in the group discussion.

If I agree to participate, what will I be required to do?

A question sheet (*Appendix B*) specifying a series of three questions for 10 value domains will be distributed and collected in class time.
The expectation of participations will be to engage in a class discussion and to write answers to a series of three distributed questions:

- *"Self respect to me means….."*
- *"Other word(s) for self respect are…"*
- *"A person who attains self respect has….."/ "Define a person who is……."*

The discussion and responses should take no more than 20 minutes and will be conducted at the end of a lecture. Respondents who choose to remain in the lecture will imply consent.

What are the risks or disadvantages associated with participation?

There are no risks associated with participation in this project as there is no right or wrong answers and no names are required.
"If you are unduly concerned about your responses to any of the questionnaire items or if you find participation in the project distressing, you should contact Foula Kopanidis as soon as convenient. Foula will discuss your concerns with you confidentially and suggest appropriate follow-up, if necessary"

What are the benefits associated with participation?

The benefit of participation in this project is an opportunity to provide an invaluable contribution into helping the investigator to better understand the decision making process of first year undergraduate students.

What will happen to the information I provide?

Once all the completed surveys are collected, the data will be entered using statistical software to enable analysis of results. The analysis will aggregated to constitute part of a thesis report, which may also be published in academic journals. Steps have been put in place to safeguard the data collected. At no stage of this project can participants be identified, and access to the identified data will only be for the investigator and her supervisors (Prof. Tim Fry, Dr. Raju Muyle, and Dr. Christopher Ziguras). The research data will be kept securely at RMIT for a period of 5 years before being destroyed.

However, "Any information that you provide can be disclosed only if (1) it is to protect you or others from harm, (2) a court order is produced, or (3) you provide the researchers with written permission".

What are my rights as a participant?

o As a participant you have::
- ✓ The right to withdraw their participation at any time, without prejudice.
- ✓ The right to have any unprocessed data withdrawn and destroyed, provided it can be reliably identified, and provided that so doing does not increase the risk for the participant.
- ✓ The right to have any questions answered at any time.

Whom should I contact if I have any questions?

Foula Kopanidis (03) 99255475 Email: foula.kopanidis@rmit.edu.au or the supervisors listed above.

What other issues should I be aware of before deciding whether to participate?

There are no other issues as a participant you should be aware of.

Yours Sincerely

Foula Kopanidis
MEd, Grad Dip, B.Bus (Mkt), B. Ed, Dip T.

Any complaints about your participation in this project may be directed to the Secretary, Portfolio Human Research Ethics Sub Committee, Business Portfolio, RMIT, GPO Box 2476V, Melbourne, 3001. The telephone number is (03) 9925 5594 or email address rdu@rmit.edu.au. Details of the complaints procedure are available from the above address or http://ww.rmit.edu.au/council/hrec

Appendix A2: Questionnaire – Qualitative

RMIT BUSINESS

Please complete the grid below as to what each value means to you. There is no right or wrong answer.

Value Domains:			
	To me …….means:	**Other words for:**	**A person who acquires …….. is:**
Self- fulfilment:			
Self- respect:			
Sense of accomplishment:			
Security:			
Sense of Belonging:			
Relationships with others:			
Being well respected			
Fun and enjoyment in life:			
Excitement:			

Thank you for your participation.

Appendix A3: Analysis of Value Statements

Self Fulfilment

- to be happy with what you have
- being content
- a happy person
- being content, happy, relaxed
- satisfy oneself in order to fill what we wish
- satisfaction
- to satisfy my needs and wants
- I want to do something to improve my world
- happy with yourself and where you are in your life
- satisfied, complete
- works hard to achieve the goal
- to fufill what's missing in my life
- happy
- happiness and feeling as though my life is the best it can be and on reaching my potential in academic and social pursuits
- happiness, content, relaxed, focused
- well-balanced content, " at one " with the world
- happiness satisfaction with what you are
- that I have achieved life goals, happiness
- happiness, fullness of life, happy successful
- affinities of satisfaction because they had served a purpose for a greater good,
- being whole and complete and satisfied and content
- successful, happy
- satisfaction out of carrying out a task
- achieve success, satisfy
- satisfied with a current condition
- to do what you are planning and do it well
- happiness with myself and personal satisfaction
- being happy with happy with who you are and where you are in life,
- satisfaction, content
- being completely happy with yourself
- content, happy, satisfied
- someone who is happy with what they have done
- achieving something, proving something to yourself
- pleased, content
- achieving goals
- achieving my goals in career, education, and relationships
- acquiring knowledge in reaching your potential
- getting what you want, satisfied, happy in life
- had it has in yourself, achieve what you want to achieve
- internally happy with their life stage
- achievement, happiness, internal happiness, and no longer searching
- achieving goals that are considered vital to the individual,
- self satisfaction,
- content, calm, reflective
- meeting goals satisfying yourself
- confident, happy, content
- to strive to one's potential
- achievement of goals, happy, successful

Self Fulfilment

- I can get anything I want,
- having lots of money lots of friends respect from other people
- doing things in life which make you happy and achieving your goals
- achievements, generally happy, motivated, had aspirations
- being happy with what you've achieved achieving what you plan to,
- achievements, content, happy, satisfied
- content with the stage of your life and the things going on in, satisfaction
- happy and feeling content
- happy, satisfaction, having fun
- happy with their life
- to achieve everything desired in life,
- achievement, accomplishment, happy
- being happy withwho you are and what you have achieved
- you are happy with yourself after doing something to a high standard
- private, generally happy, proud about oneself, understanding themselves
- achieving my tertiary studies on time
- success
- happy with self no need to search further
- content, pleased, relaxed, confident
- achieved goals set
- self satisfaction, more confident, pleased with themselves
- being happy, being satisfied with the life you were living,
- whole, happy, complete
- happy with the life they are living, doesn't need anything more in their life to make them happy
- it needs to be in it you are content and happy with what you have achieved. You have achieved goals that you have previously says in a pleased with the results
- content, satisfy, happy
- achieving a goal of something that I set out to achieve
- completion, realisation, happy, humble
- happiness and achieved most goals
- love, satisfaction
- achieving a state of being at ease/content with oneself i.e who you are
- pride content, happy
- achieving all my personal goals in life and feeling satisfied for doing so
- personal achievement completeness
- successful in their own eyes are not necessarily others
- bringing out the full potential and ensuring you putting all that you have got
- aspirations, fulfilment, believing in oneself
- brings out the full potential of oneself
- being happy with yourself, your life, and achieving all the goals you want
- happiness, contentment
- they are happy in their own skin and proud to be who they are
- being close to the ideal self. Bridging the gap between the action itself an ideal self
- bridging your potential, satisfaction,
- satisfied with themselves
- when you achieve your goals
- very happy in life and has a very positive attitude
- being satisfied with life
- satisfaction, complete
- happy satisfied, complete
- completeness being whole striving for success and succeeding
- the setting goals for various things and accomplishing them

Self Respect

- having a sense of dignity about yourself. Being proud of the way you go about your life
- dignity, pride, moral
- proper and will never let themselves live on the street. They will kill themselves (all be depressed) if they do not live to these standards
- has high self-esteem
- not compromising myself and acting in a way which is true to me
- self-awareness, true to self, morally aware, respectful
- Knows who they are and is happy with themselves Does not compromised themselves for others
- not having to always look to others for approval
- appreciating yourself
- loving oneself, able to respect others in the same way
- being able to take here all look after your body and mind
- respect
- things before they act to whether the actions ago to conflict with themselves
- appreciating and accepting your strengths and weaknesses
- self acceptance
- comfortable with their shortcoming
- standing up to yourself and what you believe in, looking after yourself and maintaining your well-being, doing good things the yourself
- believing in yourself
- not afraid to stand up for what they believe in
- respect in yourself looking after yourself and standing up for what you believe in
- belief in oneself unafraid, strong, respectful
- believes in oneself and is not afraid to speak out and stand up for the values
- looking after yourself, respecting yourself like you would others stop making sure you follow and stick to your own beliefs and values
- self love
- does not sell out on their personal beliefs and values
- maintaining a set of actions that that reflects positively who you are and what you stand for
- Honour, pride
- sure in themselves and how they act and react in life's situations
- the way you carry yourself, live in the way you want to within the means of what you believe is right
- morals, ethics, Noble
- self-respect is noble
- looking after yourself and taking care of yourself and your values and your beliefs
- confident, not self harming, comfortable in their own skin
- thinking that you as a person, as a friend, as anything are worthwhile of anything
- love for themselves, were the,
- feel you can tackle any challenge that is set upon you ,to like oneself
- please with yourself
- respectful, confident
- knowing when to say no
- you fit in the world
- feels " worthy"
- being proud of who I and not being ashamed, not doing anything to embarrass myself or my family
- Pride, self pride, proud, confident
- appreciate your strengths, accepting your weaknesses and recognise in your importance is a unique individual
- well rounded, happy, positive, able to form healthy relationships with others
- Pride
- accepting who you are a living by your personal morals and values
- while, acceptance, moral, lucky
- respect yourself
- Loving oneself physically and mentally
- confident
- do not do something that can hurt other people

Self Respect

- your life, being honest with oneself,
- honest and truthful
- honest with themselves and others around them
- having confidence in yourself, being happy with the you are, having pride in yourself
- pride dignity, confidence
- able to be confident in themselves, after and stand up for themselves and have happy, healthy relationships with those around them
- having a feeling of worth and that you only deserve what's right, self-esteem
- excepted who they are
- being happy/content with your choices, who you are
- respect in oneself and ensuring you are well presented and happy
- integrity
- positive, generous, confident
- looking good, taking good care of self image
- having a standard that doesn't compromise dignity or esteem
- Love, dignity, standards, morals,
- strong mentally and high self-esteem
- being happy with yourself, comfortable in your skin
- considering oneself of enough value to be treated with on a, being deserving of "good"
- grounded, confident
- no one can treat me badly and neither will I, belief, honour
- doing the right thing, being seen by others as morally conscious
- a person who is morally and ethically wealthy
- respecting others
- believing in myself, normally I'm doing the right thing
- morality, honour
- to not take any crap from someone else
- pride belief in oneself
- is not insecure and knows what he or she will take in terms of criticism and pressure
- believing that you are a worthy person and not lesser of a person than anyone else
- someone who treats people well
- feeling that you are an honourable person
- honour, pride in one's morals, decisions
- Honourable to themselves
- to take care of myself and respect me in every case
- validation of me as a person
- Rich in confidence
- know your own limits and strengths
- understanding and honouring oneself, hold yourself with high regard
- self honour, self regard
- self confident
- exceeded the boundary of insecurity to a stage where they no longer need to validate will justify their existence
- knowing yourself and where you fit in the world
- feels " worthy"
- being proud of who I and not being ashamed, not doing anything to embarrass myself or my family
- Pride, self pride, proud, confident
- appreciate your strengths, accepting your weaknesses and recognise in your importance is a unique individual
- well rounded, happy, positive, able to form healthy relationships with others
- accepting who you are a living by your personal morals and values
- respect yourself
- Loving oneself physically and mentally
- confident
- do not do something that can hurt other people
- to stand up for what you believe in
- someone who does not want to be pushed around
- self honour

Being Well Respected

- that other people will ask your opinion on many subjects,
- someone we can all look to a
- adored
- respected by fellow peers and co workers and friends
- a welcoming person
- good reputation
- people looking up here
- do good and do something that is good to people in society
- dont let people put you down, show respect to others to get the respect for yourself
- moral person and tries to do the right thing by everyone and themselves
- heading other people at towards me in a polite way of regarding my feelings and rights
- appreciated, taken care of, polite
- feels comfortable with others and can function well in relationships
- acknowledged and accepted to who you are
- good as long as doesn't cloud judgment
- good to other people
- have very high skills in some specific area
- admired by others
- confident achiever
- being trusted by people who know you
- to be validated for who you are and what you are
- validated, respected, he
- people are not looking down on you
- is a person who is kind warm person
- safety, good reputation,
- wants to be accepted works hard behaves well has the skill and knowledge
- others turn to you for guidance
- proud, morally and ethically wealthy
- having other people's good opinion held in high regard
- going to progress in life and make good choices
- being liked and acknowledged
- Status, iconic, liked, favoured,
- does justice to their morals and social standing
- having a positive attitude and not worrying what others think or say
- idolised, looked up to
- such a person in a higher forehead position
- any amount of respect in which others to perceive about you
- liked, a loved cared for respected
- being treated how you think you deserve to be treated
- is content in themselves and feel deserving of respect
- having people view you as a genuine person
- liked by others and is viewed as being a good person
- how you are perceived by others
- Honour legend, inspirational
- high reputation
- loved cared and relied on
- having made achievements, being with its things, that others think highly of
- if successful in work, family and leisure
- the sense of respect admiration shown by others to oneself
- proud, knowledgeable or brave
- respect, believes values and role model
- having and gaining respect from those who might feel are important influences in my life
- respecting yourself, the people you care about respecting new
- to be treated with dignity
- people are treated with dignity has high self-esteem as well
- being successful in what you do without pride or arrogance affecting you
- doing things well in the eyes of other people

Being Well Respected

- being a role model and looked upon by others
- that people don't make fun of you for what you believe in, they respect of decisions even if they don't agree
- I been accepted by others
- being appreciated and phrases in the community
- prestige, reputation, standing,
- seen positive in the eyes of others and admired
- liked by others and is viewed as being a good person
- how you are perceived by others
- Honour legend, inspirational
- high reputation
- loved cared and relied on
- having made achievements, being with its things, that others think highly of,
- if successful in work, family and leisure
- the sense of respect admiration shown by others to oneself
- proud, knowledgeable or brave
- looked upon by others
- respect, believes values and role model
- being a role model and looked upon by others
- that people don't make fun of you for what you believe in, they respect of decisions even if they don't agree
- I accepted by others
- being appreciated and praises in the community
- prestige, reputation, standing,
- seen positive in the eyes of others and admired
- being liked
- doing the right thing
- having and gaining respect from those who might feel are important influences in my life
- respecting yourself, the people you care about respecting new
- to be treated with dignity
- people are treated with dignity has high self-esteem as well
- being successful in what you do without pride or arrogance affecting you
- doing things well in the eyes of other people
- honest, generous kind
- others having strong positive beliefs about some aspect of view,
- held in high esteem
- probably respected for a good reason
- others will look up to you and admire you
- has entered respected through doing or being someone admirable
- having good morals and ethics, being friendly and likeable and having strong friendships
- likeable, looked up to
- true to themselves
- ability to fit in society
- you are someone that people look up to an admire

Sense of Accomplishment

- completion
- some has lived the life
- felt completion and or achievement of something
- feeling complete, feeling like a winner, happy
- finish something or achieve something
- achievement
- achieving a goal and being satisfied with the outcome
- winning, self-fulfilment, satisfy, complete
- feeling like I have achieved something important in my life
- thankful, happy, likely to see themselves in a positive light
- achieved what you set out to do
- happy with the job done on something
- achievement, success
- achievement of goals and success
- satisfaction, proud of what's been accomplished, valued
- knowing that you have achieved something for yourself
- satisfaction with your efforts
- satisfied, happy
- to feel that you have achieved something
- that you feel better when you do something right
- you have achieved something, achievement, pride
- has completed a task
- achieving a goal that you had previously set for yourself
- someone who achieves a set goal
- what has achieved something, finished something
- fulfilment, content and happy to completed something or reached a goal
- completing what I set out to do
- achievement, only gained if the person's efforts result in completion of a goal
- achieve an an undefined objective
- satisfaction of task
- elation at completion, internal satisfaction
- Feeling satisfied with what one is achieving. Heading good outcome to tasks undertaken
- self-fulfilment, motivated, proud
- content in what I have achieved
- trying and achieving your best
- achieving something and feeling happy and proud of doing so
- winning, achievement, goals, determined, positive
- feeling that you have achieved something that required work and effort
- feeling fulfilled, happy
- achieving something, reaching that goal
- the dollar orientated and works towards the final result
- proud of their achievements
- completing something really hard
- achievement, complete
- feeling of achieving one's goals
- works hard
- enough to complete tasks to a high standard. Finishing the task/job
- the satisfied, hard-working, committed, a high achiever
- the achieving work/life balance
- internal happiness and satisfaction
- is able to also give to others
- having completed something to your absolute best ability
- completed, succeeded, achieved

Sense of Accomplishment

- feels rewarded satisfied, pleased
- completing a task and feeling happy with the result
- happy to have achieved something and overcome a challenge
- feeling like you have achieved something you had set out to do
- reaching your goals, achieving set tasks
- content with themselves, confident in their abilities
- setting goals that you have achieved and feel proud about
- pride, goal setting, achievement
- the feeling of obtaining a goal will outcome
- proud, happy, content
- the feeling you get when you achieve something and you are satisfied, it has been done well
- establishing personal goals and ensuring these goals are reached and fulfilled
- complete, accomplished, reach fulfilment
- one who has previously set goals and have fulfilled and exceeded them
- achieving any goals you set whether it's big or small
- proud of themselves, happy with what they have achieved
- going for personal goals
- will work towards achieving goals
- they are a better person for having accomplished their goals
- you feel like you have done a good job
- happy and satisfied and fulfilled
- having completed all finish something you can be proud of
- the fulfilling what I set out to do
- thinking or sensing that you are doing things right

Sense of Belonging

- being wanted; a person who feels loved
- being part of something all or social circle
- attachment
- goals/ target in own life
- the feeling like you're wanted
- you are happy with who you are in a group/ circumstance/ workplace
- has found what they're looking for
- to be part of the country, culture, community, not being left alone, not feeling lonely
- feeling accepted in my group of friends/ wider community for who I am
- attached , connected
- has many friends and meet many people
- feelings you have a place within a community/ group
- having friends fitting in a group, or at work
- attachment, emotional dependency and clinginess
- at risk of heart, overpowering head
- to feel you belong in your environment and blend well with environment
- to feel that you specially belong somewhere
- respectful to wherever they feel they belong
- being accepted by friends and family
- feeling included an accepted feeling "at home"
- wants to be in a group and feeling included
- being comfortable
- defined by your character, an everchanging process
- part of a group
- having a place where one can feel safe and at peace where/when they are home
- safe and assumed, comfortable
- feeling in tune with others
- heading love from boyfriend, parents and friends
- having support from others, family
- feeling like you know who you are and where you fit in socially
- has found themselves and people they feel comfortable around
- being accepted for who you are and being able to be yourself
- to feel comfortable in your community
- feeling like you are part of something bigger than you
- being welcomed able to relax and fit in with people
- feeling comfortable in the environment where you live in
- " arriving home"
- feeling as if you are emotionally part of something
- and someone with a sense of commradary, the friends and part of something bigger than I
- part of the group and feels a vital part of this group
- feeling as though you are part of a group or part of something
- being wanted and needed feels happy about themselves
- feeling comfortable in surroundings
- knowing where you come from, your background and your family
- the feeling of being part of a community of people by any common trend or characteristic
- inclusion
- at ease when interacting with other members of such group
- being a part of a group and feeling like a member/contributor
- he was part of the group, classified as someone
- being able to fit in with a group of people either because you share similar characteristics or you complement each other
- they feel accepted and wanted and liked and their opinion matters
- there is a purpose to your existence
- feeling comfortable doing anything around a certain group
- grounded, based, centred
- there is a purpose to your existence

Security

- a feeling of safety that it many times breeds contempt
- safe and doesn't want to go anywhere in life and works a "9 to 5" desk job
- to be protected by someone or something, you are safe
- protection, comfortable, save, content, assured
- in the house, food to eat family and friends around me,
- feels grounded feels at home
- is having a sense of safety, not being afraid,
- safety, security, safe haven
- having faith that nothing will go wrong
- preparedness, safe
- when a person is it is either financially or personally grounded
- safe, established
- well grounded and focused
- feeling comfortable within your situation
- relaxed, peace of mind
- calm, and emotionally centred
- being safe, having in place to go to work school home, having enough money to get through life
- knows where they're going next, what's going on in their life
- safe and predictable environment. Where one feel safe and comfortable no stress
- safe, comfort, predictable
- comfortable and safe among their surroundings and look forward/complaint of the future
- feeling safe, not being worried about you outside surroundings
- being with loved ones
- safety comfortable
- be free from any worries
- knowing that there is a protective barrier that will aid you in times of need
- safe
- safety. The feeling of being safe and out of harm's way
- relax, happy with their life
- feeling safe in all aspects (financially, career wise, relationships, personal)
- safe, feels relaxed and happy about the situation
- Having a sense of belonging with oneself
- at ease, belonging, content
- feeling secure in an environment such as home environment
- is loved by all those around him or her
- safety and reliability
- reliable, honest, welcoming
- money to do what you want
- To feel safe
- Being able to be and act yourself, having good friends, family ,
- Confident and comfortable
- Being safe and not at risk of danger
- Not feeling threatened
- Feeling safe
- Being safe and feeling secure
- Confident, goals, positive thoughts
- Enjoying life without any worry
- to have a settled, relaxed feeling about ones position emotionally and physically
- Stable mentally and physically, comfortable emotionally
- a feeling of safety, comfortable within surroundings, financially stability
- having an adequate level of certainty that things will go as planned is optimal
- safety, assurance, confidence
- prepared for life in the future

Warm Relationship with Others

- how you treat others
- to have a bond with another person or thing, is however could be negative as well as positive
- friend, Bond, Link
- loves to be around people they enjoy being in another person's Company
- give and take, speaking and listening, not to thinking about yourself
- friendship, family,
- fulfil, has support from others
- is able to connect and communicate with others
- interaction
- having common ground with another
- the quantity and quality of social life
- sociability, rapport, connection, affiliation
- intimate and socially connected with others
- having a bond with other people
- happy to be around those people, can go to them if something goes wrong in their lives
- contributing, learning from relationship with others
- the long, give/take, development, learning
- has the ability to give and take, although others
- the bonds and ties formed with other people
- friends and family, lovers
- how will you connect with others, having friends who are good friends and you understand each other
- the way you feel towards those that are close to you
- understanding another person
- understands people and better understand themselves
- love, friendship, family, work related, the context of two peoples affiliation with each other
- is social and will experience with another person
- adding a friendship that allows you to share explore in different ways
- friendship, love, relations
- either positive or negative experiences with other human beings
- the ability to form friends and bonds with other people
- interactions that are mutually satisfying on different levels
- ability to work in groups
- friendships, enjoyment around other people of
- include friendships and partners. Brings meaning into life
- interacting on more than a superficial level
- opening up and bonding with others
- chance opportunities love sex
- to be compatible to love to share in comfort and enjoy
- compatibility likeness adapter coolly
- the interactions and connections with other individuals
- caring that another person
- empathising, network
- sharing and caring people that mean something to you
- the ability to work with other people
- connected to people all around you
- friends, caring between friends
- important to networks and the stress
- interaction with other people
- forming meaningful connections with others to satisfy person needs
- friendships, associations, networks, family
- is able to function well in a social environment and the community, feels appreciated and connected
- friendship, love
- understand and connect to others
- feeling loved friends
- important human interaction with fellow human beings
- feels a sense of belonging ;sense of importance
- knowing other people, bonds

Being Well Respected

- that other people will ask your opinion on many subjects,
- someone we can all look to a
- adored
- respected by fellow peers and co workers and friends
- a welcoming person
- good reputation
- people looking up here
- do good and do something that is good to people in society
- dont let people put you down, show respect to others to get the respect for yourself
- moral person and tries to do the right thing by everyone and themselves
- heading other people at towards me in a polite way of regarding my feelings and rights
- appreciated, taken care of, polite
- feels comfortable with others and can function well in relationships
- acknowledged and accepted to who you are
- good as long as doesn't cloud judgment
- good to other people
- have very high skills in some specific area
- admired by others
- confident achiever
- being trusted by people who know you
- to be validated for who you are and what you are
- validated, respected, he
- people are not looking down on you
- is a person who is kind warm person
- safety, good reputation,
- wants to be accepted works hard behaves well has the skill and knowledge
- others turn to you for guidance
- proud, morally and ethically wealthy
- having other people's good opinion held in high regard
- going to progress in life and make good choices
- being liked and acknowledged
- Status, iconic, liked, favoured,
- does justice to their morals and social standing
- having a positive attitude and not worrying what others think or say
- honest, generous kind
- others having strong positive beliefs about some aspect of view,
- held in high esteem
- probably respected for a good reason
- others will look up to you and admire you
- has entered respected through doing or being someone admirable
- having good morals and ethics, being friendly and likeable and having strong friendships
- likeable, looked up to
- true to themselves
- ability to fit in society
- successful as a city in
- you are someone that people look up to an admire
- idolised, looked up to
- such a person in a higher position
- any which others to perceive about you
- liked, a loved cared for respected
- being treated how you think you deserve to be treated
- is content in themselves and feel deserving of respect
- having people view you as a genuine person
- liked by others and is viewed as being a good person
- how you are perceived by others
- Honour legend, inspirational
- high reputation

Being Well Respected

- liked, a loved cared for respected
- being treated how you think you deserve to be treated
- is content in themselves and feel deserving of respect
- having people view you as a genuine person
- liked by others and is viewed as being a good person
- how you are perceived by others
- honour legend, inspirational
- high reputation
- loved cared and relied on
- having made achievements, being with its things, that others think highly of,
- if successful in work, family and leisure
- the sense of respect admiration shown by others to oneself
- proud, knowledgeable or brave
- looked upon by others
- respect, believes values and role model
- being a role model and looked upon by others
- that people don't make fun of you for what you believe in, they respect of decisions even if they don't agree
- I accepted by others
- being appreciated and phrases in the community
- prestige, reputation, standing,
- seen positive in the eyes of others and admired
- being liked
- doing the right thing
- having and gaining respect from those who might feel are important influences in my life
- respecting yourself, the people you care about respecting new
- to be treated with dignity
- people are treated with dignity has high self-esteem as well
- being successful in what you do without pride or arrogance affecting you
- doing things well in the eyes of other people
- eyes of other people

Fun and Enjoyment in Life

- doing something you want to do, with the right people
- doing what they want to do not only in playtime but in what to
- doing what makes you happy, take enjoying every moment
- the joy, happiness
- is happy, satisfied, cheerful
- you live life to the fullest, enjoy being in people's lives and people love to be around you because of that
- uninhibited, spontaneous, happy
- always happy and isn't scared to try something new
- doing what you love, take time to relax and have fun
- thrilled, relaxation, fulfillment
- is vital to me to live a happy satisfied life
- doing what you want to do
- smiling happiness
- enjoying what you're doing, getting the most out of life
- doing the activities that excite and stimulate new
- leisure, recreation, life
- having a great time in whatever you do
- are happy like what they do they smile about life
- being in a pleasant environment and happy to be
- excitement, fun, happy, content
- who likes we're they are and content environment
- living life, joy
- living life enjoying life experience in life
- means reaching a life balancethat allows you to enjoy it the best of all aspects of life including family work and leisure
- I can manage all aspects of life well
- to do everything possible
- the purpose of life
- enjoyment in getting the most out of life
- being happy and living your life to the full
- being happy and have enjoyable times throughout one's life
- is happy and know how to have a good time
- making the most of any opportunity that presents you
- party, passion, weekends
- able to enjoy life that any major problems such as abuse will alcoholism
- in getting the most out of life than taking chances, doing exciting and once off activities
- good time, adventure
- happy, motivated, sell fulfilled
- getting what you want and then joined
- being happy, not stressed
- happy with themselves and others around them
- being happy having good friends
- satisfaction, joy, and, happy
- things that provide fulfillment
- has the complete life which isn't only centred around work and achievements
- doing what you want
- satisfaction
- doing things for myself and doing activities which make me happy
- overall wool being great times
- live lives life to full, positive attitude
- having lots of free time, I do not need to worry about money

Fun and Enjoyment in Life

- to be happy
- being the crazy
- it needs downtime and dark time to appreciated
- happy looks forward to the future
- critical in reaching a level of comfort and purpose in life
- being happy
- Jean things you like
- important, happiness
- loves life takes time out
- doing something that is of interest to you, everyone is different in this regard
- excitement, fulfilment
- people who do things that are of interest then
- enjoyed every minute of your life
- happy experiences they give you a reason to live
- happy-go-lucky
- should be balanced
- should be part of everyone everything but
- spending time with friends and family having type to do things on my own enjoyment
- happy with who you are aware you are in life
- positive energy
- achievement in some area
- achieving the goals set for one film also enjoying life and its experiences
- doing things that you want to
- balanced with work

Excitement

- gives me a sense of enthrallment
- doing something new, doing something you love
- Rush
- the new experiences, open to possibilities
- you are joyous and happy
- looking for to something a lot
- stimulation of the pleasurable nature
- pumped
- love
- jumpy and eager
- thrills, energy, enjoyment
- getting a thrill out of something
- challenging dolls international travel rewards
- happy ecstatic happy satisfied
- to do things the passion, enthusiastic, feels good what you do
- something that thrills do
- thrilled
- fun, Rush
- doing something new
- having fun not being to wait down
- spontaneity, and join life
- thrill, happiness looking forward to something
- anticipation of something positive
- never to be bored or essentially to never be completely at ease with oneself
- aware adventurous
- fun, happy, young at heart
- experiencing a lot of new things and feelings
- going on a roller coaster and holidays
- thrill breathtaking activities
- being more than content
- joy and exhilaration
- in the moment
- feeling enthused about an event or possibility
- having some spice in life
- being passionate, laughing
- living on an each in a fun and enjoyable way
- thrilling, and nuisance
- getting a rush, the bein
- outgoing, risk taker
- a feeling of happiness involved in being proactive doing things you enjoy
- adventure, risk, Rush
- a feeling of happiness short lived
- if someone looking for an adrenalin rush
- looking forward to something
- happy, crazy amazing
- looking forward, anticipating
- a thrill
- being extremely happy
- very happy thrilled
- is very happy smiles a lot and laughs a lot
- feeling you get when you are happy

Excitement

- to be successful
- to have your heart rate and feel pumped
- always has stores to tell about new and exciting things
- anticipation over a soon-to-be event, going somewhere, seeing someone or something
- jitters
- happy about an upcoming event occasion or experience
- feelings of happiness and joy at what's to come, looking forward to the future
- happy
- is happy and looking forward to the future
- getting a thrill from doing something
- positive energy above everyday life
- energy, passion, vitality far
- arousal entertainment
- stimulated
- not being up to contain Joy
- elation, joy
- fall of happiness and looking for to something greatly
- being alive

Appendix A4: Qualitative Analysis

Values	Category Descriptors
a. Self- Fulfilment a	1. Being **happy** with what you have 2. **Well balanced** , content, 3. **Achieving** vital goals in life and **succeeding** 4. **Satisfied** with a sense of completion 5. **Believing** in one self
b. Self- respect	1. Having a **sense of dignity** 2. Not **compromising** oneself 3. **Standing up** to what you believe in 4. Maintaining a **set of actions** 5. A **belief** of being worthy, confident and proud
c. Sense of accomplishment	1. Achieving a **personal goal** 2. **Completing successfully** what one set out to do 3. **Contentment and pride** in ones' efforts 4. **Internal satisfaction** for doing something right 5. **Working hard** towards a final result
d. Security	1. Having **faith** 2. **Protection** by someone 3. Feeling **safe, security** 4. Mentally and Emotional stability 5. Being **able to be and act yourself**
e. Sense of Belonging	1. Being **part of something** bigger than you 2. **Acceptance** in the environment 3. **Fitting in/ acceptance** with a group of similar people 4. Part of a community 5. Feeling **welcomed**
f. Warm Relationships with Others	1. **Socially connected** with others 2. **Interactions / connections** mutually satisfying 3. **Bonds and ties** formed with people 4. **Friendships/ associations**/ networks 5. **Contributing and learning** from relationships
g. Being well respected	**1**. **Admiration** by others 2. Social standing **/ Role Model** 3. Respecting oneself/ others around you 4. **Expert** and successful 5. Well respected/ opinions
h. Fun and enjoyment in life	1.Doing **something you want to do** 2.T**he most out of life** 3. Being **happy** and knowing how to have a good time 4. Do what I want to do 5. Having a **great time in** whatever one chooses to do
i. Excitement	1. A sense of **enthrallment/ excitement** 2. **Looking forward** to something 3. New **experiences** and possibilities 4. Anticipation of something **positive** 5. Thrill and risk of **breathtaking activities**

Appendix B1: Plain Language Statement: Quantitative

RMIT BUSINESS

Dear Student

You are invited to participate in a research project being conducted by the School of Economics, Finance and Marketing at RMIT Business. This information sheet describes the project in 'plain English'. Please read this sheet carefully and be confident that you understand its contents before deciding whether to participate. If you have any questions about the project, please ask one of the investigators. You may choose not to participate.

Who is involved in this research project? Why is it being conducted?

The investigator is a PhD student enrolled in a PhD degree by research in Marketing in the School of Economics, Finance and Marketing. The investigator is also a lecturer in Marketing in the School of Economics, Finance and Marketing.

The supervisors for this research project are:

- Prof Tim Fry (Director of Research) Economics, Finance and Marketing, RMIT University tim.fry@rmit.edu.au 99251478
- Dr. Raju Mulye (Senior lecturer) Economics, Finance and Marketing, RMIT University, raju.mulye@rmit.edu.au 99255561
- Dr. Christopher Ziguras (Senior Research Fellow) PVC Design & Social Context Global Studies, Social Science & Planning christopher.ziguras@rmit.edu.au

The research is conducted to investigate the decision making process of first year undergraduate students in a higher educational context.

Why have you been approached?

Your cohort has been randomly selected from a population pool of first year undergraduate students enrolled in this particular portfolio.

What is the project about? What are the questions being addressed?

The project involves identifying and understanding the reasons underlying a student's selection criteria when choosing to study at a particular university and in a particular faculty and program
Some research questions relevant to this project include:

- To investigate the relationship between personal values and motivation
- To investigate the role and influence values have on student preferences

The investigator anticipates receiving at least 100 responses.

If I agree to participate, what will I be required to do?

If you agree to participate you are requested to provide answers to 21 questions. The questions asked in the questionnaire will fall under 5 Parts:

- Part 1: Preferences for program and university
- Part 2: Motivation
- Part 3: Selection Criteria
- Part 4: Personal Values
- Part 5: Demographic

The questions will primarily involve asking you to rate the importance of statements and to respond to closed ended questions. Two questions (if relevant) require a one word open response. It is expected the questionnaire will take no more than 10 – 15 minutes to complete.

What are the risks or disadvantages associated with participation?

There are no risks associated with participation in this project as there is no right or wrong answers and no names are required.

"If you are unduly concerned about your responses to any of the questionnaire items or if you find participation in the project distressing, you should contact Foula Kopanidis as soon as convenient. Foula will discuss your concerns with you confidentially and suggest appropriate follow-up, if necessary"

What are the benefits associated with participation?

The benefit of participation in this project is simply an opportunity to provide an invaluable contribution into helping the investigator to better understand the decision making process of first year undergraduate students.

What will happen to the information I provide?

Once all the completed surveys are collected, the data will be entered using statistical software to enable analysis of results. The analysis will aggregated to constitute part of a thesis report, which may also be published in academic journals. Steps have been put in place to safeguard the data collected. At no stage of this project can participants be identified, and access to the identified data will only be for the investigator and her supervisors (Prof. Tim Fry, Dr. Raju Mulye Dr Christopher Ziguras). The research data will be kept securely at RMIT for a period of 5 years before being destroyed.

However*, "*Any information that you provide can be disclosed only if (1) it is to protect you or others from harm, (2) a court order is produced, or (3) you provide the researchers with written permission".

What are my rights as a participant?

What are my rights as a participant?

o As a participant you have::
- ✓ The right to withdraw their participation at any time, without prejudice.
- ✓ The right to have any unprocessed data withdrawn and destroyed, provided it can be reliably identified, and provided that so doing does not increase the risk for the participant.
- ✓ The right to have any questions answered at any time.

Whom should I contact if I have any questions?

Foula Kopanidis (03) 99255475 Email: foula.kopanidis@rmit.edu.au or the supervisors listed above.

What other issues should I be aware of before deciding whether to participate?

There are no other issues as a participant you should be aware of.

Yours Sincerely

Foula Kopanidis
MEd, Grad Dip, B.Bus (Mkt), B. Ed, Dip T

Appendix B2: Data Collecting Instrument - Questionnaire

Part 1: Preferences for program and university:

Q.1 When you made your decision to enter into a higher education institution, which did consider:

1.1 First: (Circle ***One***)

1	University
2	Discipline (Faculty) i.e. *Business*
3	Program (Degree) i.e. *Bachelor of...*

1.2 Second: (Circle ***One***)

1	University
2	Discipline (Faculty)
3	Program (Degree)

Q. 2 Which portfolio are you currently enrolled in*?* (Circle ***One***)

1	Business
2	Design and Social Context
3	Science , Engineering and Technology

Q. 3 Please write below the degree program you are enrolled in :
E.g. Bachelor of Business (Marketing)

_____

Q.4. Is the program you are currently enrolled in your first preference for a degree program?

1	Yes → **Go to Q. 6**
2	No → **Go to Q. 5.**

Q.5 Please write below your order of degree program preferences *eg Bachelor of …….*

1	First preference:
2	Second preference :
3	Third preference:
4	Fourth preference:

Q. 6. Which universities did you consider applying to as your:

(Circle ***One*** for each)		1 **First Preference**	2 **Second Preference**	3 **Third Preference**	4 **Don't Know**
a. LaTrobe University	→	**1**	**2**	**3**	**4**
b. RMIT University	→	**1**	**2**	**3**	**4**
c. Melbourne University	→	**1**	**2**	**3**	**4**
d. Monash University	→	**1**	**2**	**3**	**4**
e. Deakin University	→	**1**	**2**	**3**	**4**
f. Swinburne University	→	**1**	**2**	**3**	**4**
g. Victoria University	→	**1**	**2**	**3**	**4**
h. Other (Specify_____	→	**1**	**2**	**3**	**4**

Part 2: Motivation

Q. 7 Please rate how important to you the following reasons were in making your decision to come to university *where **'1' is 'not important at all'** and **'7' is 'extremely important'*** .

There is no right or wrong answer.

(Circle ***One*** for each)	1 Not Important at all	2	3	4 Neither Important/ Unimportant	5	6	7 Extremely important
a. A degree will enable me to get a prestigious job →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
b. I want to become a better educated person →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
c. The chance to meet and make new friends →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
d. All my friends are going to university →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
e. I want to experience life as a university student →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
f. I will enjoy the academic challenge of a degree course →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
g. Gaining a degree will allow me to earn more money →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
h. My parents want me to go to university →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
i. To show I can be successful at university →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
j. I need a degree to follow my chosen career →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
k. A university degree is really important for me. →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
l. I don't want to get a job yet →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
m. Getting a degree will allow me to get the job I want	**1**	**2**	**3**	**4**	**5**	**6**	**7**
n. Attending the right institution expresses who I am	**1**	**2**	**3**	**4**	**5**	**6**	**7**
o. Choosing the right institution will get me a head start in life	**1**	**2**	**3**	**4**	**5**	**6**	**7**
p. You can tell about a person from the institution they attend	**1**	**2**	**3**	**4**	**5**	**6**	**7**
q. I get a lot of enjoyment out of learning new things	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Part 3: Selection Criteria

Q.8 How important was the following attributes in your decision to study at a university?

*Please rate where **'1' is 'not important at all'** and **'7' is 'extremely important'** when selecting a university.*

(Circle ***One*** for each)	1 **Not Important at all**	2	3	4 **Neither Important/ Unimportant**	5	6	7 **Extremely**
a. University Reputation →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
b. Course Suitability →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
c. Entry requirements →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
d. Range of Courses available →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
e. Cost of Fees →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
f. Type of University →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
g. Family Opinion →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
h. Location of University →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
i. University's resources (library, computer labs, and/or classrooms) →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
j. Recreation and other facilities available →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
k. Job Opportunities after Graduation →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
l. Teaching staff experience and qualifications →	**1**	**2**	**3**	**4**	**5**	**6**	**7**
m. Programme Reputation	**1**	**2**	**3**	**4**	**5**	**6**	**7**
n. Prestige and status of the University	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Part 4: Personal Values

Q9. The following is a list of things some people look for or want out of life.

Please read the following statements carefully and *indicate **how important*** each statement is to you

(Circle ***One*** for each)		1 Not important	2	3	4 Neither important	5	6	7 Extremely
Self- fulfilment 1. Being happy with what you have 2. Well balanced , content, " at one" with the world 3. Achieving vital goals in life 4. Satisfied with a sense of completion 5. Believing in one self	→	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Self- respect 1. Having a sense of dignity about oneself 2. Not compromising oneself 3. Standing up to what you believe in 4. Maintaining a set of actions that reflect positively on who you are 5. A belief of being worthy, confident and proud	→	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Sense of accomplishment 1. Achieving a personal goal 2. Completing successfully what one set out to do 3. Contentment and pride in ones' efforts 4. Internal satisfaction for doing something right 5. Working hard towards a final result	→	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Security 1. Having faith that nothing will go wrong 2. To be protected by someone or something 3. To feel safe, protected and secure 4. To be mentally and emotionally stable 5. Being able to be and act yourself	→	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Sense of Belonging 1. Being part of something bigger than you 2. Accepted and included in your environment 3. Fitting in with a group of similar people 4. Feeling of being part of a community 5. Being welcomed and accepted for who you are	→	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Warm Relationships with others 1. Intimate and socially connected with others 2. Interactions and connections mutually satisfying with others 3. The bonds and ties formed with people 4. Building friendships, associations and networks 5. Contributing and learning from relationships	→	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Being well respected **1**. Being admired by others 2. Doing justice to ones morals and social standing 3. Respecting oneself and others around you 4. Being successful without arrogance 5. Being seem as a role model and looked upon by others	→	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Fun and enjoyment in life 1. Getting the most out of life is important to me 2 .Doing things for myself which make me happy is important to me 3. It is important to me to be happy and know how to have a good time 4. Doing something I want to do is important to me 5. I always seek to have a great time in whatever I choose to do	→	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Excitement 1. I always enjoy the thrill and risk of breathtaking activities 2. It is important to me to look forward to something 3. I always seek new experiences and possibilities 4. I always enjoy the anticipation of something new 5. I like to go to places that involve exciting activities	→	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Part 5: Demographics

Q.10 What is your gender? (Circle ***One***)

1 Female	**2** Male

Q.11. How old are you? (Circle ***One*** bracket)

1	17-20
2	21-24
3	24-27
4	27 +

Q.12. Where were you born? Please specify the country

_____

Q. 13 What is your entry level? (**Circle *One*)**

1	School leaver- Yr 12 completion entry ranked score
2	Mature age student (Yr 12 completed more than 2 years ago
3	Transfer from another course or institution
4	Other (Please specify_____)

Q. 14 What type of student are you? (**Circle *One*)**

1	Australian – CSP Deferred payment
2	Australian – CSP Paying upfront
3	Australian – Full fee paying
4	International – Full fee paying
5	Other – (Please specify……..)

Q. 15 Do you have older brothers and or sisters who completed university degree?

(**Circle One**)

1	Yes → **Continue**
2	No → **Go to Q 18**

Q. 16 What degree program did they study? *i.e. Bachelor of …..*

Please specify _____

Q. 17 At which university?

Please specify _____

Q18. Where were your parents born? Please specify the country

Father	
Mother	

Q.19. What is the highest level of education your parents have completed?

(Circle ***One***)

	Father	**Mother**
Completed Primary School	**1**	**1**
Completed High School	**2**	**2**
Diploma (TAFE)	**3**	**3**
University Degree	**4**	**4**
Post graduate Degree	**5**	**5**
Don't know	**6**	**6**

Q.20 What is the occupation of your parents? Please specify.

Father	
Mother	

Q. 21 What is your parent's combined household gross income? *(**Circle One**)*

1	$ Under $20 000
2	$ 20 000 – 29 000
3	$ 30 000 – 39 000
4	$ 40 000 – 49 000
5	$ 50 000 – 59 000
6	$ 60 000 – 69 000
7	$ 70 000 – 79 000
8	$ 80 000 – 89 000
9	$ 90 000 and over

Thank you very much for your co-operation.

Appendix C1: Factor Analysis of Personal Values Scale (PVS)

Communalities

	Initial	Extraction
VA	1.000	.730
VB	1.000	.655
VC	1.000	.655
VD	1.000	.458
VE	1.000	.801
VF	1.000	.633
VG	1.000	.635
VH	1.000	.613
VI	1.000	.522

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.455	49.502	49.502	4.455	49.502	49.502	3.153	35.036	35.036
2	1.247	13.858	63.360	1.247	13.858	63.360	2.549	28.324	63.360
3	.814	9.046	72.406						
4	.650	7.223	79.629						
5	.559	6.214	85.843						
6	.378	4.199	90.042						
7	.351	3.901	93.943						
8	.314	3.492	97.435						
9	.231	2.565	100.000						

Extraction Method: Principal Component Analysis.

Appendix C2: Factor Analysis of Motivation Scale (MIS)

Communalities

	Initial	Extraction
a. External Motive	1.000	.683
b. Internal Motive	1.000	.535
c.External Motive	1.000	.556
d.Amotivation	1.000	.573
e. Internal Motive	1.000	.605
f.Internal Motive	1.000	.646
g.External Motive	1.000	.691
h. Amotivation	1.000	.598
i. External Motive	1.000	.452
j.Amotivation	1.000	.597
k. External Motive	1.000	.564
l. Amotivation	1.000	.430
m. External Motive	1.000	.555
n. External Motive	1.000	.757
o.External Motive	1.000	.666
p. Amotivation	1.000	.607
q.Internal Motive	1.000	.719

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.955	26.367	26.367	3.955	26.367	26.367	3.086	20.575	20.575
2	2.484	16.557	42.925	2.484	16.557	42.925	2.611	17.409	37.985
3	1.733	11.553	54.477	1.733	11.553	54.477	2.474	16.493	54.477
4	1.166	7.775	62.252						
5	.793	5.286	67.539						
6	.695	4.632	72.170						
7	.634	4.226	76.397						
8	.557	3.713	80.110						
9	.532	3.547	83.657						
10	.519	3.463	87.120						
11	.471	3.140	90.260						
12	.414	2.758	93.018						
13	.390	2.598	95.616						
14	.347	2.316	97.932						
15	.310	2.068	100.000						

Extraction Method: Principal Component Analysis.

Appendix C 3: Factor Analysis of Selection Criteria (SCIS)

Communalities

	Initial	Extraction
Reputation	1.000	.683
Course Suitability	1.000	.543
Entry	1.000	.550
Range of courses	1.000	.529
Cost	1.000	.515
University Type	1.000	.410
Family Opinion	1.000	.645
Location	1.000	.408
Resources	1.000	.681
Facilities	1.000	.628
Job opportunites	1.000	.432
Teaching Quals	1.000	.662
Programme Reputation	1.000	.708
Status and Prestige	1.000	.709

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.962	28.301	28.301	3.962	28.301	28.301	2.451	17.510	17.510
2	1.547	11.049	39.350	1.547	11.049	39.350	2.296	16.397	33.907
3	1.314	9.384	48.734	1.314	9.384	48.734	1.811	12.934	46.842
4	1.280	9.143	57.877	1.280	9.143	57.877	1.545	11.036	57.877
5	.920	6.574	64.452						
6	.849	6.065	70.517						
7	.735	5.249	75.765						
8	.644	4.602	80.367						
9	.581	4.149	84.516						
10	.545	3.890	88.406						
11	.499	3.565	91.971						
12	.417	2.982	94.952						
13	.403	2.876	97.828						
14	.304	2.172	100.000						

Extraction Method: Principal Component Analysis.

Appendix D1: Mean and Standard Deviation of PVIS scale items

	Business (128)		Design and Social Context		Science, Engineering and Technology		Portfolios (304)	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Self fulfilment (INT)								
Q9A1	**6.0703**	1.28089	**6.3678**	.97784	**6.2584**	.93576	**6.2105**	1.10881
Q9A2	5.5703	1.22110	5.9080	1.20688	5.6292	1.01558	5.6842	1.16563
Q9A3	5.8672	1.31239	5.8966	1.04586	5.8989	.97753	5.8849	1.14461
Q9A4	5.9375	1.14156	5.6782	1.29843	5.7416	1.05020	5.8059	1.16544
Q9A5	5.7422	1.27512	5.9885	1.14622	5.6742	1.15577	5.7928	1.20771
Self Respect (INT)								
Q9B1	**6.0938**	1.16119	5.9770	1.04522	**5.9663**	1.06012	**6.0329**	1.09856
Q9B2	5.4063	1.35993	5.5402	1.17932	5.3708	1.17146	5.4342	1.25428
Q9B3	5.9141	1.26134	**6.0230**	1.06724	5.9888	1.01684	5.9671	1.13694
Q9B4	5.4922	1.25489	5.2299	1.10707	5.4831	1.30656	5.4145	1.23183
Q9B5	5.7891	1.24643	5.5747	1.13744	5.7640	1.07685	5.7204	1.16782
Sense of Accomplishment (INT)								
Q9C1	**6.1172**	1.24899	6.0460	.98722	5.8315	1.17971	5.8816	1.16003
Q9C2	5.6719	1.19124	5.7241	1.08574	5.6629	1.10725	5.6842	1.13406
Q9C3	5.6797	1.22913	5.6552	1.12919	5.6966	1.12214	5.6776	1.16665
Q9C4	5.8047	1.19749	5.8736	1.05439	5.9101	1.14456	5.8553	1.13979
Q9C5	5.8047	1.11847	**6.0575**	1.06046	**6.0000**	1.06600	**6.0559**	1.08401
Security (EXT)								
Q9D1	4.3750	1.72065	3.5977	1.54363	3.8764	1.58702	4.0066	1.66103
Q9D2	4.6875	1.52538	4.5172	1.42128	4.3483	1.69291	4.5395	1.54954
Q9D3	5.4453	1.52051	5.0920	1.27254	5.3820	1.50383	5.3257	1.45194
Q9D4	**5.7813**	1.22916	**5.4023**	1.08327	**5.6180**	1.51136	**5.6250**	1.28619
Q9D5	5.4609	1.39686	5.0920	1.22600	5.5506	1.23409	5.3816	1.31221
Sense of Belonging (EXT)								
Q9E1	5.7266	1.28415	**5.6161**	1.16668	**5.6966**	1.43340	**5.7618**	1.31530
Q9E2	5.2344	1.55975	5.4483	1.24600	5.4045	1.37939	5.5526	1.30644
Q9E3	5.0313	1.40268	4.8391	1.42138	5.1461	1.43456	5.0954	1.48949
Q9E4	5.6016	1.42718	4.9770	1.30274	4.8427	1.52925	4.9605	1.41132
Q9E5	**6.0078**	1.31913	5.4943	1.25637	5.4494	1.38179	5.5263	1.36407
Warm Relationships with others (EXT)								
Q9F1	**5.7031**	1.19289	5.4253	1.30858	5.4270	1.40525	5.5428	1.29411
Q9F2	5.4375	1.29657	5.1954	1.20887	5.3933	1.25787	5.3553	1.26077
Q9F3	5.5234	1.20344	5.3793	1.37453	5.3820	1.32721	5.4408	1.28835
Q9F4	**5.7031**	1.33611	5.4713	1.25605	**5.5393**	1.33192	**5.5888**	1.31204
Q9F5	5.6406	1.32650	**5.4828**	1.22818	5.3596	1.33355	5.5132	1.30238
Being Well Respected (EXT)								
Q9G1	5.2344	1.46069	4.3448	1.45336	4.6180	1.65492	4.7993	1.56146

Q9G2	5.4766	1.41402	4.4138	1.44312	**5.0787**	1.58275	**5.0559**	1.53297
Q9G3	5.0547	1.52826	4.2874	1.42982	4.3820	1.82474	4.6382	1.62915
Q9G4	5.1484	1.53741	4.4138	1.58152	4.5730	1.88226	4.7697	1.68460
Q9G5	**5.5703**	1.40126	**4.8161**	1.46691	4.9663	1.43376	5.1776	1.46511
Fun and enjoyment in Life (INT)								
Q9H1	**6.0781**	1.14747	5.7126	1.23804	5.6854	1.34499	5.8586	1.24402
Q9H2	5.9688	1.17008	**5.8736**	1.07622	**6.0337**	1.00509	**5.9605**	1.09533
Q9H3	5.9766	1.20016	5.7356	1.16599	5.8427	1.01016	5.8684	1.13849
Q9H4	5.7344	1.29496	5.7126	1.19988	5.6629	1.07602	5.7072	1.20360
Q9H5	5.5703	1.31427	5.5517	1.34475	5.5506	1.12827	5.5592	1.26769
Excitement (INT)								
Q9I1	5.0938	1.53406	4.8966	1.58506	5.3258	1.45988	5.1053	1.53144
Q9I2	**5.7422**	1.26893	**5.8207**	1.23176	**5.7753**	1.11552	**5.8171**	1.21279
Q9I3	5.3125	1.33251	5.5287	1.11896	5.4270	1.33048	5.4079	1.27352
Q914	5.3672	1.48944	5.5287	1.22796	5.4831	1.16884	5.4474	1.32650
Q915	5.4219	1.58541	5.4828	1.35425	5.5843	1.25959	5.4868	1.42809

Appendix D2: Parenthetical definitions applied to List of Values per Portfolio

Values	Business	Design and Social Context		All Portfolios
	Statement	Statement	Statement	Statement
A Self Fulfilment	It is important to feel happy with yourself and where you are in life (**A1**)	It is important to feel happy with yourself and where you are in life (**A1**)	It is important to feel happy with yourself and where you are in life **(A1)**	It is important to feel happy with yourself and where you are in life **(A1)**
b. Self Respect	Being worthy, confident and proud are beliefs that are very important to me **(B5)**	It is important to stand up to what you believe **(B3)**	It is important to stand up to what you believe **(B3)**	It is important to have a sense of dignity about one self **(B1)**
c. Sense of Accomplishment	I get a deep sense of satisfaction form achieve a personal goal. **(C1)**	Finishing something makes me feel content and satisfied **(C5)**	Finishing something makes me feel content and satisfied **(C5)**	Finishing something makes me feel content and satisfied **(C5)**
d. Security	It is important to me to be mentally and emotionally stable **(D4)**	It is very important to me to be mentally and emotionally stable **(D4)**	It is very important to me to be mentally and emotionally stable **(D4)**	It is very important to me to be mentally and emotionally stable **(D4)**
e. Sense of Belonging	Feeling comfortable and „at ease" with my family and friends is very important to me **(E1)**	Accepted and included in my social environment is important to me **(E2)**	Feeling comfortable and „at ease" with my family and friends is important to me **(E1)**	Feeling comfortable and „at ease" with my family and friends is important to me **(E1)**
f. Warm Relationships with others	Being socially connected with others is very important to me (**F1)** Building friendships, associations and networks is very important to me (**F4)**	Contributing and learning from relationships is very important to me **(F5)**	Being socially connected with others is very important to me **(F1)**	Building friendships, associations and network is very important to me **(F4)**
g. Being Well respected	People who have expertise in some areas are well respected **(G5)**	People who have expertise in some areas are well respected **(G5)**	It is important for me to have a good reputation **(G2)**	People who have expertise in some areas are well respected **(G5)**
h. Fun and Enjoyment in life	Getting the most out of life is very important to me (**H1)**	Doing things for myself which makes me happy is very important to me **(H2)**	I always seek to have a great time in whatever I choose to do **(H5)**	Doing things for myself which makes me happy is very important to me **(H2)**
i. Excitement	It is important to me to look forward to something **(I2)**	It is important to me to look forward to something **(I2)**	I like to go to places that involve exciting activities **(I5)**	It is important to me to look forward to something **(I2)**

Appendix D3: Mean and Standard Deviation of MIS scale items

	Business		Design and Social Context		Science, Engineering and Technology		All Portfolios	
	Mean	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
a. External Motive	6.4141	.84674	4.5862	2.03202	5.9438	.94580	5.7533	1.52265
b. Internal Motive	5.6406	1.36165	**5.8161**	**1.28975**	5.3933	1.40306	5.6184	1.35916
c. External Motive	4.8281	1.63191	4.3793	1.48826	4.7640	1.46956	4.6809	1.55223
d. Amotivation	3.2422	1.94712	2.4713	1.49292	2.9663	1.66822	2.9408	1.76969
e. Internal Motive	4.7422	1.68946	4.0920	1.68186	4.5730	1.57312	4.5066	1.67094
f. Internal Motive	4.6953	1.61469	5.3908	1.31500	4.8427	1.37261	4.9375	1.48903
g. External Motive	6.0000	1.14328	4.4253	1.73629	6.0449	.98754	5.5625	1.48570
h. Amotivation	4.7891	1.79084	3.2874	1.85465	4.5169	1.98353	4.2796	1.96775
i. External Motive	4.8594	1.68240	4.1034	1.85544	4.5843	1.78255	4.5625	1.78443
j. Amotivation	5.7188	1.43048	4.9310	1.91562	5.6629	1.36468	5.4770	1.60016
k. External Motive	5.7734	1.38163	4.7126	1.73814	5.3258	1.59385	5.3388	1.60866
l. Amotivation	2.9453	1.74928	3.4138	2.07169	3.3708	1.95624	3.2039	1.91344
m. External Motive	5.9141	1.30431	5.4943	1.52402	5.9213	1.29882	5.7961	1.37799
n. External Motive	4.30469	1.71862	3.60920	1.88849	3.82022	1.93391	3.9638	1.85141
o. External Motive	5.2344	1.53430	4.2069	1.79235	4.4157	1.80157	4.7007	1.74795
p. Amotivation	3.7891	1.78203	2.8966	1.69153	3.4944	1.65916	3.4474	1.75492
q. Internal Motive	4.7656	1.60454	5.7701	1.25477	5.9438	1.37326	5.1151	1.50134

Appendix D4: Mean and Standard Deviation of PVIS scale items

	Business		DSC		SET	
Atrtributes	**Mean**	**Std. Deviation**	**Mean**	**Std. Deviation**	**Mean**	**Std. Deviation**
Rep.	5.7969	1.32427	5.2299	1.44432	5.2022	1.65268
Cou.suit	5.9766	1.22613	**6.4828**	**.87420**	5.8989	1.20647
Entry	5.4609	1.45214	5.2644	1.48996	4.8764	1.52122
Rancours	4.8672	1.57925	4.9425	1.48916	4.6966	1.40133
Cost	4.2969	2.01709	3.9310	1.71039	4.0449	1.80221
Univtype	5.1563	1.48715	4.7241	1.41987	4.9101	1.31978
Famop	4.3359	1.75363	3.3563	1.67038	3.8202	1.85596
Loc.	5.4609	1.62608	5.4943	1.17011	4.9326	1.72415
Resou.	4.7344	1.74557	4.7241	1.38673	4.6404	1.50942
Facili.	4.1484	1.77067	3.5977	1.73513	4.0674	1.57968
Jobopp.	**6.3828**	1.21747	5.3333	1.75649	**6.0899**	**1.19317**
Teachqul	5.2031	1.57420	5.2184	1.55088	4.9663	1.61280
Progrep.	5.8516	1.17111	5.9885	1.15632	5.2472	1.47156
Statprest.	5.7031	1.16619	4.8621	1.37395	5.1124	1.33517

The Full Model

Appendix E1: Maximum Likelihood Estimates Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
MOTIVATION	<---	INTERNAL	.326	.045	7.310	***	
SELECT_CRITERIA	<---	MOTIVES	1.334	.219	6.097	***	
vsfi	<---	INTERNAL	1.000				
vsai	<---	INTERNAL	.730	.056	13.104	***	
repu	<---	SELECT_CRITERIA	.666	.083	8.033	***	
aca	<---	SELECT_CRITERIA	1.000				
intrinsic	<---	MOTIVES	1.000				
ent	<---	SELECT_CRITERIA	.454	.053	8.525	***	
vipi	<---	INTERNAL	.584	.063	9.260	***	
extrinsic	<---	MOTIVES	.682	.149	4.562	***	
vwre	<---	EXTERNAL	1.000				
vsbe	<---	EXTERNAL	1.069	.099	10.750	***	
vrbe	<---	EXTERNAL	.851	.095	8.963	***	
vsri	<---	INTERNAL	.615	.051	11.965	***	
exter	<---	SELECT_CRITERIA	.207	.051	4.039	***	

Appendix E2: Implied Covariances (Group number 1 - Default model)

	Ext	vbre	vepe	vfpe	extri	ent	intri	aca	rep	vipi	vsai	vsri	vsfi
Exter.	7.014												
vbre	.370	16.222											
vepe	.465	6.877	13.20										
vfpe	.435	6.434	8.081	12.82									
extrinsic	.624	.914	1.148	1.074	13.36								
ent	1.134	.813	1.021	.955	1.371	6.074							
intrinsic	.916	1.341	1.684	1.575	2.263	2.011	5.661						
acad	2.497	1.789	2.247	2.102	3.020	5.483	4.428	21.11					
rep	1.663	1.192	1.497	1.400	2.011	3.652	2.950	8.042	15.75				
vipi	.517	2.401	3.015	2.821	1.278	1.136	1.875	2.502	1.666	11.51			
vsai	.647	3.003	3.771	3.528	1.599	1.421	2.345	3.129	2.084	4.199	9.691		
vsri	.545	2.529	3.177	2.972	1.347	1.197	1.975	2.636	1.756	3.536	4.424	8.132	
vsfi	.886	4.111	5.164	4.831	2.189	1.946	3.211	4.285	2.854	5.749	7.191	6.057	13.10

Appendix F1: Goodness-of-Fit for the Full Model

	Chi-Square	df	Sig.
Pearson	1196.031	546	.000
Deviance	379.316	546	1.000

Appendix F2: Pseudo R-Square

Cox and Snell	.600
Nagelkerke	.678
McFadden	.423

Appendix F3: Parameter Estimates for Factors for Baseline Model

Portfolio(a)		B	Std. Error	Wald	df	Sig.	Exp(B)
Business	Intercept	-.190	.925	.042	1	.837	
	[OCCFATHER4=1.00]	-.398	.430	.858	1	.354	.672
	[OCCFATHER4=2.00]	**-1.179**	**.568**	**4.314**	**1**	**.038**	**.308**
	[OCCFATHER4=3.00]	-.165	.800	.043	1	.836	.848
	[OCCFATHER4=4.00]	0(b)	.	.	0	.	.
	[OCCMOTHER=1.00]	.108	.383	.080	1	.778	1.114
	[OCCMOTHER=2.00]	-.365	.529	.477	1	.490	.694
	[OCCMOTHER=3.00]	-1.148	.825	1.935	1	.164	.317
	[OCCMOTHER=4.00]	0(b)	.	.	0	.	.
	[Q4PREFERENCES= 1.00]	**.756**	**.377**	**4.027**	**1**	**.045**	2.130
	[Q4PREFERENCES= 2.00]	0(b)	.	.	0	.	.
	[Q10Gender=1.00]	**1.041**	**.339**	**9.446**	**1**	**.002**	2.833
	[Q10Gender=2.00]	0(b)	.	.	0	.	.
	[AGEAGGR=1.00]	-.435	.502	.750	1	.387	.647
	[AGEAGGR=2.00]	0(b)	.	.	0	.	.
	[COMBINCAGG=1.00]	.340	.414	.674	1	.412	1.404
	[COMBINCAGG=2.00]	-.172	.379	.205	1	.651	.842
	[COMBINCAGG=3.00]	0(b)	.	.	0	.	.
	[COUNTRYAGG=1.00]	.051	.411	.016	1	.900	1.053
	[COUNTRYAGG=2.00]	1.002	.599	2.799	1	.094	2.725
	[COUNTRYAGG=3.00]	0(b)	.	.	0	.	.
	[EDFAAGG4=1.00]	-.766	.851	.810	1	.368	.465
	[EDFAAGG4=2.00]	-1.108	.880	1.588	1	.208	.330
	[EDFAAGG4=3.00]	-.705	.840	.703	1	.402	.494

	[EDFAAGG4=4.00]	-1.597	.946	2.850	1	.091	.202
	[EDFAAGG4=5.00]	0(b)	.	.	0	.	.
	[EDMOAGG4=1.00]	1.124	.740	2.308	1	.129	3.078
	[EDMOAGG4=2.00]	1.167	.777	2.255	1	.133	3.213
	[EDMOAGG4=3.00]	1.280	.745	2.953	1	.086	3.595
	[EDMOAGG4=4.00]	.917	.914	1.006	1	.316	2.501
	[EDMOAGG4=5.00]	0(b)	.	.	0	.	.
Portfolio(a)		**B**	**Std. Error**	**Wald**	**df**	**Sig.**	**Exp(B)**
Design and Social Context	Intercept	-2.344	1.276	3.375	1	.066	
	[OCCFATHER4=1.00]	.010	.558	.000	1	.985	1.011
	[OCCFATHER4=2.00]	**-2.625**	**.925**	**8.048**	**1**	**.005**	.072
	[OCCFATHER4=3.00]	.607	1.010	.362	1	.548	1.836
	[OCCFATHER4=4.00]	0(b)	.	.	0	.	.
	[OCCMOTHER=1.00]	.024	.476	.003	1	.959	1.025
	[OCCMOTHER=2.00]	.141	.682	.043	1	.836	1.152
	[OCCMOTHER=3.00]	-.816	1.001	.664	1	.415	.442
	[OCCMOTHER=4.00]	0(b)	.	.	0	.	.
	[Q4PREFERENCES=1.00	**2.113**	**.574**	**13.54**	**1**	**.000**	8.273
	[Q4PREFERENCES=2.00]	0(b)	.	.	0	.	.
	[Q10Gender=1.00]	**2.244**	**.422**	**28.33**	**1**	**.000**	9.429
	[Q10Gender=2.00]	0(b)	.	.	0	.	.
	[AGEAGGR=1.00]	**-2.721**	**.569**	**22.88**	**1**	**.000**	.066
	[AGEAGGR=2.00]	0(b)	.	.	0	.	.
	[COMBINCAGG=1.00]	-.943	.602	2.458	1	.117	.389
	[COMBINCAGG=2.00]	.229	.435	.277	1	.598	1.258
	[COMBINCAGG=3.00]	0(b)	.	.	0	.	.
	[COUNTRYAGG=1.00]	**1.611**	**.539**	**8.933**	**1**	**.003**	5.010
	[COUNTRYAGG=2.00]	-1.682	1.242	1.834	1	.176	.186
	[COUNTRYAGG=3.00]	0(b)	.	.	0	.	.
	[EDFAAGG4=1.00]	1.152	1.206	.913	1	.339	3.164
	[EDFAAGG4=2.00]	.052	1.218	.002	1	.966	1.053
	[EDFAAGG4=3.00]	.389	1.160	.112	1	.738	1.475
	[EDFAAGG4=4.00]	.337	1.227	.076	1	.783	1.401
	[EDFAAGG4=5.00]	0(b)	.	.	0	.	.
	[EDMOAGG4=1.00]	-.628	.921	.465	1	.495	.534
	[EDMOAGG4=2.00]	.698	.956	.534	1	.465	2.010
	[EDMOAGG4=3.00]	.820	.913	.807	1	.369	2.271
	[EDMOAGG4=4.00]	1.405	1.021	1.896	1	.169	4.077
	[EDMOAGG4=5.00]	0(b)	.	.	0	.	.

Appendix F4: Parameter Estimates for Factors for Full Model

Parameter Estimates

Portfolio		B	Std. Error	Wald	df	Sig.	Exp(B)
Business	Intercept	.008	.992	.000	1	.994	
	F1INTERNAL	-.136	.228	.353	1	.552	.873
	F2EXTERNAL	.306	.208	2.169	1	.141	1.358
	FA1REPINFL	**.698**	**.198**	**12.475**	**1**	**.000**	**2.010**
	FA2ACADINFL	-.065	.196	.111	1	.739	.937
	FA3ENTRYINFL	.350	.191	3.369	1	.066	1.419
	FA4EXTERINFL	**.455**	**.219**	**4.314**	**1**	**.038**	**1.576**
	FAC1EXTR	.061	.266	.053	1	.819	1.063
	FAC2AMOTI	-.130	.238	.299	1	.584	.878
	FAC3INTRIN	**-.468**	**.239**	**3.847**	**1**	**.050**	**.626**
	[OCCFATHER4=1.00]	-.690	.486	2.013	1	.156	.502
	[OCCFATHER4=2.00]	**-1.548**	**.634**	**5.957**	**1**	**.015**	**.213**
	[OCCFATHER4=3.00]	-.556	.851	.428	1	.513	.573
	[OCCFATHER4=4.00]	0(b)	.	.	0	.	.
	[OCCMOTHER=1.00]	.435	.430	1.021	1	.312	1.545
	[OCCMOTHER=2.00]	-.701	.602	1.354	1	.245	.496
	[OCCMOTHER=3.00]	-.991	.876	1.281	1	.258	.371
	[OCCMOTHER=4.00]	0(b)	.	.	0	.	.
	[Q4PREFERENCES=1.00]	.613	.400	2.341	1	.126	1.845
	[Q4PREFERENCES=2.00]	0(b)	.	.	0	.	.
	[Q10Gender=1.00]	**.977**	**.392**	**6.228**	**1**	**.013**	2.657
	[Q10Gender=2.00]	0(b)	.	.	0	.	.
	[AGEAGGR=1.00]	-.612	.551	1.233	1	.267	.542
	[AGEAGGR=2.00]	0(b)	.	.	0	.	.
	[COMBINCAGG=1.00]	.488	.465	1.101	1	.294	1.630
	[COMBINCAGG=2.00]	-.155	.434	.128	1	.721	.856
	[COMBINCAGG=3.00]	0(b)	.	.	0	.	.
	[COUNTRYAGG=1.00]	.006	.458	.000	1	.989	1.006
	[COUNTRYAGG=2.00]	.895	.629	2.030	1	.154	2.448
	[COUNTRYAGG=3.00]	0(b)	.	.	0	.	.
	[EDFAAGG4=1.00]	-1.049	.938	1.251	1	.263	.350
	[EDFAAGG4=2.00]	-1.043	.984	1.124	1	.289	.352
	[EDFAAGG4=3.00]	-.483	.935	.266	1	.606	.617
	[EDFAAGG4=4.00]	-1.505	1.045	2.073	1	.150	.222
	[EDFAAGG4=5.00]	0(b)	.	.	0	.	.
	[EDMOAGG4=1.00]	1.382	.860	2.583	1	.108	3.982
	[EDMOAGG4=2.00]	1.112	.894	1.547	1	.214	3.040
	[EDMOAGG4=3.00]	1.249	.851	2.153	1	.142	3.487
	[EDMOAGG4=4.00]	.894	1.060	.711	1	.399	2.444
	[EDMOAGG4=5.00]	0(b)	.	.	0	.	.
Portfolio		**B**	**Std. Err**	**Wald**	**df**	**Sig.**	**Exp(B)**
Design and Social	Intercept	-5.463	1.682	10.551	1	.001	

Context							
	F1INTERNAL	.112	.340	.109	1	.741	1.119
	F2EXTERNAL	-.398	.284	1.959	1	.162	.672
	FA1REPINFL	.027	.263	.010	1	.919	1.027
	FA2ACADINFL	-.122	.259	.220	1	.639	.885
	FA3ENTRYINFL	**.651**	**.272**	**5.743**	**1**	**.017**	**1.918**
	FA4EXTERINFL	-.254	.280	.821	1	.365	.776
	FAC1EXTR	**-1.328**	**.347**	**14.690**	**1**	**.000**	**.265**
	FAC2AMOTI	-.523	.314	2.783	1	.095	.593
	FAC3INTRIN	.543	.339	2.568	1	.109	1.721
	[OCCFATHER4=1.00]	.470	.687	.467	1	.494	1.599
	[OCCFATHER4=2.00]	**-2.506**	**1.073**	**5.453**	**1**	**.020**	.082
	[OCCFATHER4=3.00]	**1.014**	**1.230**	**.680**	**1**	**.410**	2.757
	[OCCFATHER4=4.00]	0(b)	.	.	0	.	.
	[OCCMOTHER=1.00]	.064	.598	.012	1	.914	1.066
	[OCCMOTHER=2.00]	.769	.823	.874	1	.350	2.158
	[OCCMOTHER=3.00]	-1.098	1.150	.911	1	.340	.334
	[OCCMOTHER=4.00]	0(b)	.	.	0	.	.
	[Q4PREFERENCES=1.00]	**2.355**	**.691**	**11.610**	**1**	**.001**	10.543
	[Q4PREFERENCES=2.00]	0(b)	.	.	0	.	.
	[Q10Gender=1.00]	**3.065**	**.581**	**27.800**	**1**	**.000**	21.438
	[Q10Gender=2.00]	**0(b)**	**.**	**.**	**0**	**.**	.
	[AGEAGGR=1.00]	**-2.718**	**.722**	**14.154**	**1**	**.000**	.066
	[AGEAGGR=2.00]	**0(b)**	**.**	**.**	**0**	**.**	.
	[COMBINCAGG=1.00]	**-1.845**	**.823**	**5.031**	**1**	**.025**	.158
	[COMBINCAGG=2.00]	.633	.550	1.322	1	.250	1.883
	[COMBINCAGG=3.00]	0(b)	.	.	0	.	.
	[COUNTRYAGG=1.00]	**2.015**	**.770**	**6.847**	**1**	**.009**	7.498
	[COUNTRYAGG=2.00]	-2.455	1.509	2.647	1	.104	.086
	[COUNTRYAGG=3.00]	0(b)	.	.	0	.	.
	[EDFAAGG4=1.00]	1.869	1.323	1.996	1	.158	6.484
	[EDFAAGG4=2.00]	.691	1.271	.296	1	.587	1.996
	[EDFAAGG4=3.00]	.329	1.290	.065	1	.799	1.389
	[EDFAAGG4=4.00]	.426	1.374	.096	1	.756	1.531
	[EDFAAGG4=5.00]	0(b)	.	.	0	.	.
	[EDMOAGG4=1.00]	.356	1.098	.105	1	.746	1.428
	[EDMOAGG4=2.00]	1.685	1.149	2.150	1	.143	5.393
	[EDMOAGG4=3.00]	1.846	1.095	2.845	1	.092	6.336
	[EDMOAGG4=4.00]	**3.456**	**1.317**	**6.891**	**1**	**.009**	31.694
	[EDMOAGG4=5.00]	0(b)	.	.	0	.	.

a The reference category is: Science, Engineering and Technology.
b This parameter is set to zero because it is redundant..