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Courses and Careers: Measuring how Students' Personal Values Matter

Purpose – Students' values influence their choice of academic degrees that direct future careers. This study investigates measuring personal values by testing the relevance of the original nine personal values in the List of Values (LOV) scale in the situation specific context of higher education in relation to student's educational choices in pursuing particular career pathways.

Design/methodology/approach – The study involved two stages of iterative analysis of data from undergraduate students (N = 304) at an Australian university for the purpose of constructing a personal values importance scale (PVIS). The paper assesses construct dimensionality, and convergent and discriminate validities of PVIS.

Findings – Results suggest a two-factor PVIS scale of internal and external values is a valid and reliable psychometric diagnostic tool leading to better understanding of choice behaviour in an educational context. Business students reported both internal and external values as important; however, science, engineering and technology, and design and social context students perceived internally oriented values more aligned to their program choice.

Practical implications –This research provides new insights into measuring the values influencing the program choices with a career focus toward particular fields. It allows educational institutions to make more informed decisions for attracting and retaining those students most suited to the educational and career paths they choose. Marketing and educational implications are discussed.

Originality/value–This research offers a psychometrically rigorous measurement instrument valid in an education context.

Keywords – careers, choice, factor analysis, measurement instrument, personal values

Classification – research paper

1 Introduction

The personal values that undergraduate students hold about educational institutions significantly impact not only on how they approach their educational experience and determine their choices of courses to degree completion (Willis, Shann and Hassell, 2009; Ledden, Kalafatis and Samouel, 2006) but also their career paths (Ng, Burke and Fiksenbaum, 2008). Prospective students express their aspirations to a field of study by choosing particular degree programs through matching their personal interests, career objectives and judgment of attainability. Tertiary education presents students with a multitude of challenges and issues as they strive to find a path to course completion (Credé and Niehorster, 2011). Past research has affirmed that values held prior to study predict career fit. In other words, individuals will pursue careers that are harmonious with their value systems (Vigoda-Gadot and Grimland, 2008). A multitude of reasons prompt prospective students to make the choice to pursue higher education. Whatever these motives may be, the decision calls for an extreme level of involvement (Conway, Mackay and Yorke, 1994) whereby students may consciously, or unconsciously, trade off between preferences in order to decrease their level of perceived risk.

According to Greenbank (2011), enhancing employability in a chosen field is a primary driver of students enrolling in higher education. Education then plays an important role as a training ground in determining the expectations and preferences held towards the future workforce. Different careers are underpinned by different values, (Singh, Bhandarker, Rai and Jain, 2011) and these values are a major influence on the career paths students may pursue and also on their long-term career satisfaction (Willis *et al.*, 2009). For example, business, management and engineering students are concerned with conformity values like obedience and self-control, perhaps because these professions require the individual to adhere to a strict standard of norms, while students of social sciences and arts allocate great importance to values expressing self-direction as beauty and freedom, disapproving stability and conformity in the workplace (Da Silva Anana and Nique, 2011). Other career paths such as those described as “protean” are strongly driven by the personal values held by individuals (Sargent and Domberger, 2006) who endeavour to integrate work and life values. One study found students who

identified with achievement and security values tended to exhibit a higher tendency to achieve at the commencement of their degree (Lietz and Matthews, 2010).

Given that personal values are prioritised by the individual and this impacts on career development (Vogoda-Gadot and Grimland, 2008), universities need to ensure that the resources invested optimise students' potential to seek and manage their ideal career paths by choosing a degree program that matches their values, interests and skills base (Miller and Liciardi, 2003). Educational institutions also have an important role in fostering realistic expectations of how choice of academic program may impact on future workforce prospects (Ng and Burke, 2006). Changes in the workplace environment over time have also altered the values and expectations of employee and of generational cohorts. For example, the work-related values of Gen Y (those born between 1978-1994) such as loyalty, fickleness and job transition may differ from those of Gen X (1963-1978) and/or of the Baby Boomers (1946-1962) (Clark, 2011).

The purpose of this study is to develop a reliable and valid measurement instrument to measure prospective students' value profiles and their educational choices. The dimensions of the List of Values (LOV) deemed important in other service contexts may not be applicable in a higher education context characterised by high involvement, complex decision making, and a multitude of choices (Moogan and Baron, 2000). Psychometrically sound and informed measurements can allow universities to monitor, attract and retain students best matched to their program offerings (Carle *et al.*, 2009), their students' academic majors (Pike, Smart, and Ethington, 2011) and their career choices. The paper is structured as follows. In the next section, insights from values and choice research are summarised. The data and methods used to construct and test the personal values importance scale (PVIS) scale and the results of exploratory and confirmatory factor analysis are reported. The key findings and the implications of the study are then discussed.

2. Personal values and choices

Personal values are effective predictors of behaviour across different contexts (Madrigal, 1995; Maio and Olson, 1994). Before the research conducted by Milton Rokeach (1968, 1973), many of the studies that examined values classified them as a sub-category of

attitudes. Central to most definitions of values is that a value constitutes a belief and is of an abstract and enduring nature (Schwartz, 1994; Shrum, McCarty and Loeffler, 1990). Values also provide potentially powerful explanations of human behaviour because they serve to guide attitudes and behaviour; they often act as standards for conflict resolution and decision making across different contexts (Kim *et al.*, 2002; Kamakura and Novak, 1992). Importantly, Rokeach (1973) contends values exist in a hierarchical interconnected system whereby once a value is learned it becomes part of a value system in which each value is ordered in priority relative to other values. This ordering facilitates the selection and maintenance of the end goals and at the same time regulates the manner in which striving takes place (Guttnam and Vinson, 1979). To explain the relationship between values and behaviour in different contexts, investigations across a broad range of disciplines have linked value research to diverse areas of marketing, including social marketing as gift giving (Beatty, Kahle and Homer, 1991), complaint behaviour (Kau, Keng and Liu, 1997), e-shopping (Jayawardhena, 2004), product choices (Homer and Kahle, 1988; Pitts and Woodside 1984), bank selection (Karjaluoto, 2002; Almosawi, 2001; Ta and Har, 2000), and store selection (Kim, Forsythe, Gu and Moon, 2002; Shim and Eastlick, 1998). However, no attempt to date has been made to develop the LOV scale to assess the influence of values on students' preferences and their career paths. A validated scale to assess students' personal values would have important practical implications for higher education institutions in curriculum design, teaching methods and for course and career advice (Bolton and Lane, 2012).

Since they are defined as among the most abstract of social cognitions, values are considered difficult to measure (Kahle, 1983). Rather than a single value, researchers consider it more effective to use a combination or list of values (Kahle and Kennedy, 1989; Kamakura and Novak, 1992). Although somewhat dated now, the most widely known and applied method of measurement is the Rokeach value system (RVS) (Rokeach, 1973). RVS measures both instrumental beliefs about desired modes of action, such as being independent or ambitious, and terminal values about desired end states such as freedom and a comfortable life. However, criticism of the RVS, such as the limitation of rank orderings, difficulty of the lengthy ranking task, and questionable relevance of all the values to daily life (Homer and Kahle, 1988), has led to the development of other

general inventories. Derived from both Maslow's Hierarchy of Needs (1954) and Rokeach's (1973) theory, the LOV scale was developed by researchers at the University of Michigan Survey Research Centre (Kahle, 1983). As an inventory, LOV (Kahle, 1983) is a set of nine terminal values broadly differentiated into either two or three latent dimensions. The measurement instrument is established a priori to explain an individual's behaviour toward a particular construct (Lages and Fernandez, 2005) (see Table 1). LOV works on values in order to assess adaptation to various roles through value fulfilment. Although Likert-type scales may suffer from a tendency towards 'social desirability effects' whereby respondents choose one end of the scale or similar scores for all nine values (Wang and Rao, 1995; Beatty, Homer and Kahle, 1988; Shoham *et al.*, 1998), LOV has been cited extensively in past research as having acceptable psychometric properties in measuring personal values for explaining a variety of consumption behaviours (Kropp, Lavack, and Silvera, 2005).

Table 1

Dimensions of LOV (Kahle 1983)

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

Grouping the nine personal values of the LOV measurement instrument into dimensions indicates that certain value dimensions become important in situation specific contexts (Shim, Warrington and Goldsberry, 1999). The dimensions of internal values, external values, and interpersonal values, was found relevant in the context of food purchase (Chryssohoidis and Krystallis, 2005), e-shopping behaviour (Jayawardhena, 2004), and adoption of new products (Daghfous *et al.*, 1999). However, the situational factors of brand preferences (Mulyanegara and Tsarenko, 2009), clothing purchase (Sudas and Paromita, 2007), complaint behaviour (Kau *et al.*, 1997), and mall shopping attitude and behaviour (Shim and Eastlick, 1988) reduced the LOV values to two

underlying dimensions, that of internal and external values. The findings of such studies generally indicate that appealing to values congruent with a particular marketing activity can provide an avenue for individuals to identify with the marketing offering.

Interest in the values students uphold in education is not new (Shorr, 1953) nor is the notion that a career is driven by personal values (Vigoda-Gadot and Grimland, 2008), but having a sophisticated tool to examine how values function in choice behaviour in education is. The LOV inventory provides a strong foundation from which to develop a PVIS scale. As is the case in most LOV research, parenthetical definitions were developed to better define the construct measured and applied to each of the values on the survey instrument (Kropp *et al.*, 2005). In strategic terms psychometrically sound and informed measurements of the values students uphold can allow educational institutions to attract and recruit students best matched to their program offerings (Carle *et al.*, 2009) as students' academic majors impact their learning and academic development (Pike, Smart and Ethington, 2011) and their career choices (Sargent and Domberger, 2007).

3. Research method

3.1 Construction of the scale

In order to construct the PVIS scale, a number of guidelines and procedures necessary for theory building and the development of a psychometrically sound PVIS multi-item scale directed the two-stage research approach (Churchill, 1979; Bearden and Netemeyer, 1999). The guidelines for Stage 1 included *item generation* and *purifying the measure*. To measure students' understanding of personal values, the way a convenience sample of students (N = 65) interpreted the nine LOV factors was examined in Stage 1, through open-ended and semi-structured questions (e.g. To me, *self fulfilment* means.....). As the objective for this stage was to generate statements and/or definitions to capture specified value dimensions for the nine LOV values, non-probability sampling was deemed useful particularly when addressing an existing issue from a new perspective. The relatively small numbers of respondents chosen was to assist a focus on depth of responses rather than breadth, with a sample chosen assumed to reflect the characteristics of the population of interest (Mason, Augustyn and Seakhoa-King, 2010). Stage 2 survey data

(N = 304) assessed scale dimensionality and served as a precursor to exploratory and confirmatory factor analysis for testing of the construct, convergent, and discriminate validities of the PVIS scale.

Stage 1 Development of a measurement instrument.

Item generation. First-year undergraduate business students (N = 65) majoring in marketing enrolled in their first semester at an Australian university participated in Stage 1. The item development phase (Brockway, Carlson, Jones and Bryant, 2002) generated just over 900 responses to the three questions pertaining to the nine LOV values on the survey.

Purifying the measure. To test for content and face validity of the scale items, a panel of six academics with knowledge and expertise in marketing were asked to match parenthetical statements and/or definitions to the nine value constructs. Driving this approach was the objective of refining the response pool to statements representative of the constructs which avoided jargon, difficult words, and ambiguous words (Bearden and Netemeyer, 1999). Forty-five parenthetical definitions were the outcome of consolidating responses displaying similar traits into category descriptors. For example, the value of *self fulfilment* generated common category descriptors such as “being happy”, “well balanced”, “achievement”, “satisfaction and completion” and “belief in one’s self”. The PVIS scale was constructed using a seven-point, Likert-type scale (1 = strongly disagree to 7 = strongly agree) to investigate the five definitions which best represented each of the nine values. A questionnaire pre-test was then conducted on a convenience sample of 30 second-year business students to validate the questionnaire’s wording of items, ease of completion, ordering of questions, and question applicability. The final statements are listed in Table 2.

Table 2

The Scale (PVIS) Parenthetical Statements

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
-

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

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

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

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.

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

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

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

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

Stage 2 Testing the PVIS scale

Participants in Stage 2 were undergraduate students (N = 304) enrolled in their first semester in particular degree programs at an Australian university. As elements of the population logically clustered into identifiable cohorts (faculties), a cluster sampling approach was used. Three faculties – business; design and social context (DSC) including arts, humanities and social sciences; and science and engineering technology (SET) represented the cluster. Respondents were asked to rate the extent to which they agreed with five parenthetical definitions constructed to measure each personal value. Approximately 450 self-administered surveys were distributed and collected in class time

by an independent assistant who gave a brief description of the research and instructions about how to complete the survey. Across the three faculties, the final sample size was 304 respondents, which indicates a 67 per cent response rate.

3.2 Descriptive statistics

Of the 304 responses, 42 per cent were from the business faculty, 29 per cent from DSC, and the remaining 29 per cent from SET. Participants were of almost equal gender representation (58 per cent male, 42 per cent female), and predominantly school-leavers reporting their age as 18 and 19. Over 80 per cent reported that they were born in Australia, with the second largest fraction born in Asia (18 per cent).

The descriptive analysis indicated that 80 per cent of all students enrolled in different faculties and degree programs showed a strong preference to values categorised under the internal value dimension with the value of *self fulfilment* ($M = 6.21$, $S.D. = 1.10$) rating as the most important value. Both DSC and SET students reported only internal values with the values of *self fulfilment* ($M = 6.36$, $S.D. = 0.935$; $M = 6.25$, $S.D. = 0.935$) and *sense of accomplishment* ($M = 6.00$, $S.D. = 1.06$; $M = 6.25$; $S.D. = 0.935$) respectively as the most important. Business students were the only cohort who reported the external value *sense of belonging* ($M = 6.00$, $S.D. = 1.31$) in their top five values of importance.

3.3 Exploratory factor analysis

Applying SPSS, the principal component analysis (PCA) was carried out to explore the underlying factors associated with nine items from the PVIS scale for a sample of 304 first-year undergraduate students. Listwise deletion of cases was used with missing values (Zhao and Gallant, 2012). By running a separate analysis for each construct to establish a single eigenvalue above one, convergent validity was also verified. A two-factor solution for the PVIS scale was extracted, explaining 63.3 per cent of the variances in the variables. The internal consistencies of the subscales were assessed with the use of Cronbach's α for each of the two indices (0.849 and 0.792). Both factors exceeded the 0.70 criteria (Nunnally, 1994), therefore demonstrating acceptable scale reliability. The application of the PVIS scale in an educational context identified the two dimensions of internal and external values (see Table 3). The values of VA, VB, VC, and VH related to *internally* oriented values, and included the value of VI (*interpersonal*) are termed

Internal values. Values VE, VG, VF, and VD related to *externally orientated* values and incorporated the value of VF (*interpersonal*) are termed *External values*. The factor solution output is consistent with the theoretical findings suggesting internal and external dimensions to personal values (Homer and Kahle, 1988).

Table 3

PVIS- Factor loadings of items

Construct	Component	
	Factor 1	Factor 2
	(Va) (Vb) (Vc) (Vh) (Vi)	(Vd); (Vg); (Ve) (Vf)
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
Alpha	.849	.792
Sum of squares (eigenvalue)	4.455	1.247

3.4 Confirmatory factor analysis: measurement models

Two measurement models of one-factor congeneric measurement models (Jöreskog and Sörbom, 1993) and a multifactor model were constructed using AMOS 7.0 initially to examine whether there was a relationship between the observed variables and their underlying latent construct(s). The second objective directed the testing of the measurement properties of the construct, convergent, and discriminate validities of the PVIS scale. The outcome of the initial review process of model specification and “goodness of fit measures”, resulted in retaining 37 items of the 45 items representing the nine LOV values. Inspection of fit indices of goodness-of-fit (GFI), Tucker-Lewis index (TLI), comparative fit index (CFI), and adjusted goodness of fit index (AGFI)

(respectively) for the one-factor congeneric models indicated a range of 0.942 to 1.0; root mean square error of approximation (RMSEA) also fell within an acceptable range indicating the error terms are small and acceptable (Hu and Bentler, 1999).

Table 4

One- Factor Congeneric Fit Statistics Model Fit (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	(6.9)	.030	.060	.989	.965	.954
Value (b) Self respect 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 4* I gain internal satisfaction for doing something right	2	(4.7)	.095	.067	.993	.980	.963
Value (d) Security 2* To be protected by someone or something is important to me	2	(6.0)	.049	.081	.990	.949	.981
Value (e) Sense of belonging 4* I always seek to be part of a community	2	(4.5)	.105	.064	.992	.982	.962
Value (f) Warm relationships 1* Being socially connected with others is important to me	2	(6.9)	.032	.061	.989	.974	.943
Value (g) Being well respected	5	(2.1)	.827	.000	.997	1.00	.992
Value (h) Fun and enjoyment in life 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	(1.3)	.508	.000	.998	1.00	.989
<u>Total of 37 retained from 45 items</u>							
<u>* Deleted Items</u>							

3.5 Two-factor measurement model

A two-factor measurement model (Figure 1), including all items for Internal and External dimensions, did not initially fit the data well ($\chi^2 = 124.2$ (d.f) = 26, $p = 0.000$). A subsequent two-factor model with the deletion of value (h) *fun and enjoyment* and value (d) *security* showed to be a more fitting model. An examination of the model fit statistics

suggests the data fit the model data well ($\chi^2 = 20.7$ (d.f) = 13, $p = 0.078$, RMSEA = 0.044, GFI = 0.981, TLI = 0.982, AGFI = 0.959) where the error terms (>0.05) are small and acceptable (Helgesen and Nessel, 2007). The final review of the PVIS scale culminated in the two dimensions of internal and external representing seven of the original LOV nine values (see Figure 1) as a valid measurement instrument in context of higher education.

Table 5

Two Factor Model

Scale	Fit Statistics						
	df	<i>p</i>	χ^2	RMSEA	GFI	TLI	AGFI
**Value (h) Fun and enjoyment in life							
**Value (d) Security							
<u>CFA: Two factor Model -Values</u>	13	.078	20.7	.044	.981	.982	.959
**Values Removed							

3.6 Scale reliability and validity

To assess the reliability and validity of the measurement models, the squared multiple correlations for the observed variables were reported. The reliability estimates of the one-factor congeneric models were verified using Cronbach's alpha values which ranged from 0.792 to 0.849, meeting on average the minimum hurdle of 0.700 suggested by Hair *et al.*, (1998). Convergent validity and discriminant validity for the PVIS scale indicated all the items across the factor models were sufficient in displaying these properties ranging from 0.55 to 0.86 (see Figure 1), and were all significant at the 0.01 level. These results show convergent validity was supported by the data for this paper. Discriminant validity of the measurement models on the values obtained for constrained and unconstrained models for two estimated constructs at a time (Anderson and Gerber, 1988) indicated significant changes in the chi-square test (see Table 6) implying distinct concepts (Helgesen and Nessel, 2007).

Figure 1

Two Factor Measurement Model

Table 6

Discriminant Validity

Constructs	Constrained χ^2 value	Unconstrained χ^2 value	Chi square difference test
Internal Values and External Values	df(14)65.1	df(13)20.8	df(1)44.3*

* Values significant at the 0.01 level

4. Findings and discussion

This study applied the construct of personal values in the context of higher education to develop a valid and reliable psychometric diagnostic tool to examine the relationship between personal values, program choices and potential future careers. The findings provide an Australian viewpoint on the personal values that first-year undergraduate

students hold in terms of their academic choices and their future workplace representation. Significantly, the importance of PVIS as a reliable and valid measure lies not only in its contribution towards establishing greater methodological rigour in measurement instruments, but also to the continual advancement of a research field (Slavec and Drnovsek, 2012).

In Stage 1, a series of statements translated the LOV values dimensions into parenthetical statements relevant for application in an educational context. The Stage 2 survey data validated the PVIS as an effective measure of two specific value dimensions, those of external and internal values, confirming that context can influence the number of dimensions of the LOV typology. That the two external values of *security* and *fun and enjoyment* and the third dimension of interpersonal were effectively jettisoned from the PVIS reflects a generation assimilated with social media, whose expectations of consumption are of entertainment mediated by online involvements (Bakewell and Mitchell, 2003). The students did not differentiate between *fun and enjoyment* in life and *excitement*, deeming the latter a more important and relevant value. It is almost a commonplace observation, but Gen Y have grown up in relative affluence, and tend to be confident and expressive (Kapoor and Solomon, 2011), and often disregard security as an important value, preferring living for the day over investing in concepts such as loyalty and commitment (Da Silva Anana and Nique, 2010). Their preference for job flexibility rather than long-term employment (Hurst and Good, 2009) further illustrates this point. It remains undetermined whether this profile would also be maintained in the case of students from differing socio-economic backgrounds or from countries where economic and personal security was not so certain.

Internal values of *self fulfilment*, *self accomplishment*, *self respect*, and *excitement* were recognised as important to most students within this generational cohort as demonstrated by their positive identification with this value dimension. Given this insight, educational marketers can use these predictors of preferential choice behaviour for strategy development. This research suggests that educational institutions wishing to attract prospective students from this cohort should focus in their marketing communications on the internal dimension represented by these values. By positioning degree programs as pathways to achieving a particular end goal as *self accomplishment* –

for example, “*finishing something [that] makes me feel content and satisfied*” – pursuing higher education can be viewed as a vehicle for attaining such goals. Students identifying internal values as important are more likely to be internally motivated, and to perceive a sense of control and influence over outcomes (Kahle, 1983). Further, such students tend not to require the judgments or confirmations of others. Patterns of similar response choices are not unusual within generational cohorts where the similar life events of their formative socialisation years tend to set them apart, resulting in a like-minded group (Mueller, Remaud, and Chabin, 2011). Lifestyle, experiences, and shared consumption patterns as part of psychological profiles become critical in shaping values, attitudes, and behaviours (Fountain and Lamb, 2011).

Similarly, among other findings, the results indicate student cohorts choose academic programs based on their values and preferences and these values typify some careers more than others (Da Silva Anana and Nique, 2010). Academic disciplines tend to be distinctive in fostering particular student career pathways. The fields of engineering, science and technology, as well as business, are designed to provide students with practical skills and job-related competencies (Goyette and Mullen, 2006), in contrast to liberal learning (including the arts, humanities and social sciences) which tends to espouse the pursuit of learning for its own sake rather than utilitarian purposes (Bennett, 2004). The results of this study suggest that students enrolled in SET and those in DSC have a values set that traditionally has been associated with business. When comparing business and engineering, science and technology, although there is an overlap in terms of acquiring analytical and technical skills and career paths, the students identify with different values and value statements. For example understanding that business students identified with both internal and external values, and deemed the internal value of *sense of accomplishment* as the most important value, should encourage marketers and course developers to position the degree program so as this cohort of students to attain a “*deep sense of satisfaction from achieving a personal goal*”. Business students’ affiliation with the external value of *sense of belonging*, aligning with the statement “*being welcomed and accepted for who I am gives me a deep sense of belonging*”, differentiates this cohort of students. Students identifying with external values were more likely to abdicate control and rely on external factors to drive future directions and outcomes (Kahle, 1983).

Compared to business, students enrolled in SET and DSC allocated importance only to internal values. SET students aligned themselves with the values of *sense of accomplishment* and *self fulfilment*, identifying with the statement of “*finishing something makes me feel content and satisfied*” and “*it is important to feel happy with yourself and where you are in life*”, respectively. Students enrolled in art and social science majors aligned with the values of *self fulfilment*, and desired to achieve to “*feel happy with yourself and where you are in life*”, and of *sense of accomplishment*, identifying with the statement “*finishing something makes me feel content and satisfied*”. Those seeking careers in the arts and social sciences have been portrayed as a group critical of the values of “stability, conformity and virtuosity”, displaying little interest in material wealth and being more directed towards beauty, excitement and freedom (Da Silva Anana and Nique, 2010). According to Madrigal (1995) internally oriented individuals tend to feel more self motivated and are rated highly by those individuals who believe they can influence or control outcomes. Past studies have affirmed significant associations between students’ values and their academic majors, suggesting that students who showed a preference for the social and behavioural sciences scored highly in social concern (Biddle, Bank and Slavings, 1990). Similarly, engineering students identified with “social responsibility” and “relevance to one’s own interests and concerns” as among some of the important drivers for enrolling in engineering degrees (Clark, 2011).

4.1 Limitations and further research

Unavoidably, limitations are inherent in any measurement instrument (Kitwood and Smithers, 1975). To enhance and refine the psychometric properties of PVIS as a diagnostic tool of significant values, it would be useful to undertake research in several directions. First, the scope of future samples could be broadened to include other universities with similar faculties, and then the same study could be repeated in these different contexts. Second, the removal of two of the original areas provides good opportunities for the further development of other value dimensions more relevant to this generational cohort.

Third, another potential area for further research would be to examine motivation with respect to why people elect arts and humanities courses. These enrolments are significant numerically and yet because they tend not to be the flagship programs of

universities like science, education and technology or business, they tend not to be associated with as much prestige or earning potential. Enrolments in arts and humanities will persist and to cater insufficiently for this segment of the market seems to be an organisational oversight. Lastly, while it is assumed that greater alignment between values, motivation and course choice would lead to better outcomes; this assumption is as yet unproven.

5. Conclusion and implications

The present study verified the application of PVIS in an educational context. The scale development process produced two distinct dimensions of internal and external values that demonstrated reliability and validity. This understanding of the dimensions of PVIS will allow researchers to explore the link between these two variables and other potential factors that may influence students' preferences. Previous empirical evidence has shown personal values shape choices (Kropp *et al.*, 2005). The findings here contribute to the discourse dealing with the importance of understanding and aligning students' values to their academic and career choices (Singh *et al.*, 2011; Greenbank, 2011; Da Silva Anana and Nique, 2010).

There are implications in terms of the relationship between students' personal values and the course design as individuals who have similar value systems tend also to share similar behaviours (Maio, and Olson, 1994). Understanding which personal values matter to students can enable universities to improve and develop areas of the curriculum and associated appropriate teaching methods (Bolton and Lane, 2012) with the goal of better motivating students towards course completion. For example, incorporating student team projects in a business program for business-oriented students would acknowledge the importance these students allocate to the value of *sense of belonging* and their desire to receive "recognition" and "acceptance". As a validated measurement instrument, PVIS has applicability in other service sectors where personal values serve as criteria for individuals to evaluate the benefits accrued from service offerings. Additionally PVIS can provide information as to why consumers choose a service or service provider.

The insights from this study have practical implications as well for the use of the PVIS instrument by researchers, educators, and career planners. The analytical utility of the PVIS scale can inform educational institutions seeking a way to more effectively align student values at enrolment, their choice of courses and their career paths upon graduation. This information could be of great benefit to education agents and careers advisors, who could, for example, as part of a degree entrance discussion, suggest potential career gateways and course majors not only at an undergraduate level but at postgraduate level as well (Sing *et al.*, 2011). Getting students to consider their important personal values allows them at an early stage of selection to make informed choices, particularly for those whose career and/or degree preference may not be planned (Willis *et al.*, 2009). The PVIS scale allows particular faculties to better position course material offerings for their student cohort. Aligning course and career choices to value preferences can be instrumental in directing students towards specialised vocational fields that present long-term rewards and career development.

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Courses and Careers: Measuring how Students' Personal Values Matter

Purpose – Students' values influence their choice of academic degrees that direct future careers. This study investigates measuring personal values by testing the relevance of the original nine personal values in the List of Values (LOV) scale in the situation specific context of higher education in relation to student's educational choices in pursuing particular career pathways.

Design/methodology/approach – The study involved two stages of iterative analysis of data from undergraduate students (N = 304) at an Australian university for the purpose of constructing a personal values importance scale (PVIS). The paper assesses construct dimensionality, and convergent and discriminate validities of PVIS.

Findings – Results suggest a two-factor PVIS scale of internal and external values is a valid and reliable psychometric diagnostic tool leading to better understanding of choice behaviour in an educational context. Business students reported both internal and external values as important; however, science, engineering and technology, and design and social context students perceived internally oriented values more aligned to their program choice.

Practical implications –This research provides new insights into measuring the values influencing the program choices with a career focus toward particular fields. It allows educational institutions to make more informed decisions for attracting and retaining those students most suited to the educational and career paths they choose. Marketing and educational implications are discussed.

Originality/value–This research offers a psychometrically rigorous measurement instrument valid in an education context.

Keywords – careers, choice, factor analysis, measurement instrument, personal values

Classification – research paper

1 Introduction

The personal values that undergraduate students hold about educational institutions significantly impact not only on how they approach their educational experience and determine their choices of courses to degree completion (Willis, Shann and Hassell, 2009; Ledden, Kalafatis and Samouel, 2006) but also their career paths (Ng, Burke and Fiksenbaum, 2008). Prospective students express their aspirations to a field of study by choosing particular degree programs through matching their personal interests, career objectives and judgment of attainability. Tertiary education presents students with a multitude of challenges and issues as they strive to find a path to course completion (Credé and Niehorster, 2011). Past research has affirmed that values held prior to study predict career fit. In other words, individuals will pursue careers that are harmonious with their value systems (Vigoda-Gadot and Grimland, 2008). A multitude of reasons prompt prospective students to make the choice to pursue higher education. Whatever these motives may be, the decision calls for an extreme level of involvement (Conway, Mackay and Yorke, 1994) whereby students may consciously, or unconsciously, trade off between preferences in order to decrease their level of perceived risk.

According to Greenbank (2011), enhancing employability in a chosen field is a primary driver of students enrolling in higher education. Education then plays an important role as a training ground in determining the expectations and preferences held towards the future workforce. Different careers are underpinned by different values, (Singh, Bhandarker, Rai and Jain, 2011) and these values are a major influence on the career paths students may pursue and also on their long-term career satisfaction (Willis *et al.*, 2009). For example, business, management and engineering students are concerned with conformity values like obedience and self-control, perhaps because these professions require the individual to adhere to a strict standard of norms, while students of social sciences and arts allocate great importance to values expressing self-direction as beauty and freedom, disapproving stability and conformity in the workplace (Da Silva Anana and Nique, 2011). Other career paths such as those described as “protean” are strongly driven by the personal values held by individuals (Sargent and Domberger, 2006) who endeavour to integrate work and life values. One study found students who

identified with achievement and security values tended to exhibit a higher tendency to achieve at the commencement of their degree (Lietz and Matthews, 2010).

Given that personal values are prioritised by the individual and this impacts on career development (Vogoda-Gadot and Grimland, 2008), universities need to ensure that the resources invested optimise students' potential to seek and manage their ideal career paths by choosing a degree program that matches their values, interests and skills base (Miller and Liciardi, 2003). Educational institutions also have an important role in fostering realistic expectations of how choice of academic program may impact on future workforce prospects (Ng and Burke, 2006). Changes in the workplace environment over time have also altered the values and expectations of employee and of generational cohorts. For example, the work-related values of Gen Y (those born between 1978-1994) such as loyalty, fickleness and job transition may differ from those of Gen X (1963-1978) and/or of the Baby Boomers (1946-1962) (Clark, 2011).

The purpose of this study is to develop a reliable and valid measurement instrument to measure prospective students' value profiles and their educational choices. The dimensions of the List of Values (LOV) deemed important in other service contexts may not be applicable in a higher education context characterised by high involvement, complex decision making, and a multitude of choices (Moogan and Baron, 2000). Psychometrically sound and informed measurements can allow universities to monitor, attract and retain students best matched to their program offerings (Carle *et al.*, 2009), their students' academic majors (Pike, Smart, and Ethington, 2011) and their career choices. The paper is structured as follows. In the next section, insights from values and choice research are summarised. The data and methods used to construct and test the personal values importance scale (PVIS) scale and the results of exploratory and confirmatory factor analysis are reported. The key findings and the implications of the study are then discussed.

2. Personal values and choices

Personal values are effective predictors of behaviour across different contexts (Madrigal, 1995; Maio and Olson, 1994). Before the research conducted by Milton Rokeach (1968, 1973), many of the studies that examined values classified them as a sub-category of

attitudes. Central to most definitions of values is that a value constitutes a belief and is of an abstract and enduring nature (Schwartz, 1994; Shrum, McCarty and Loeffler, 1990). Values also provide potentially powerful explanations of human behaviour because they serve to guide attitudes and behaviour; they often act as standards for conflict resolution and decision making across different contexts (Kim *et al.*, 2002; Kamakura and Novak, 1992). Importantly, Rokeach (1973) contends values exist in a hierarchical interconnected system whereby once a value is learned it becomes part of a value system in which each value is ordered in priority relative to other values. This ordering facilitates the selection and maintenance of the end goals and at the same time regulates the manner in which striving takes place (Guttnam and Vinson, 1979). To explain the relationship between values and behaviour in different contexts, investigations across a broad range of disciplines have linked value research to diverse areas of marketing, including social marketing as gift giving (Beatty, Kahle and Homer, 1991), complaint behaviour (Kau, Keng and Liu, 1997), e-shopping (Jayawardhena, 2004), product choices (Homer and Kahle, 1988; Pitts and Woodside 1984), bank selection (Karjaluoto, 2002; Almosawi, 2001; Ta and Har, 2000), and store selection (Kim, Forsythe, Gu and Moon, 2002; Shim and Eastlick, 1998). However, no attempt to date has been made to develop the LOV scale to assess the influence of values on students' preferences and their career paths. A validated scale to assess students' personal values would have important practical implications for higher education institutions in curriculum design, teaching methods and for course and career advice (Bolton and Lane, 2012).

Since they are defined as among the most abstract of social cognitions, values are considered difficult to measure (Kahle, 1983). Rather than a single value, researchers consider it more effective to use a combination or list of values (Kahle and Kennedy, 1989; Kamakura and Novak, 1992). Although somewhat dated now, the most widely known and applied method of measurement is the Rokeach value system (RVS) (Rokeach, 1973). RVS measures both instrumental beliefs about desired modes of action, such as being independent or ambitious, and terminal values about desired end states such as freedom and a comfortable life. However, criticism of the RVS, such as the limitation of rank orderings, difficulty of the lengthy ranking task, and questionable relevance of all the values to daily life (Homer and Kahle, 1988), has led to the development of other

general inventories. Derived from both Maslow's Hierarchy of Needs (1954) and Rokeach's (1973) theory, the LOV scale was developed by researchers at the University of Michigan Survey Research Centre (Kahle, 1983). As an inventory, LOV (Kahle, 1983) is a set of nine terminal values broadly differentiated into either two or three latent dimensions. The measurement instrument is established a priori to explain an individual's behaviour toward a particular construct (Lages and Fernandez, 2005) (see Table 1). LOV works on values in order to assess adaptation to various roles through value fulfilment. Although Likert-type scales may suffer from a tendency towards 'social desirability effects' whereby respondents choose one end of the scale or similar scores for all nine values (Wang and Rao, 1995; Beatty, Homer and Kahle, 1988; Shoham *et al.*, 1998), LOV has been cited extensively in past research as having acceptable psychometric properties in measuring personal values for explaining a variety of consumption behaviours (Kropp, Lavack, and Silvera, 2005).

Table 1

Dimensions of LOV (Kahle 1983)

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

Grouping the nine personal values of the LOV measurement instrument into dimensions indicates that certain value dimensions become important in situation specific contexts (Shim, Warrington and Goldsberry, 1999). The dimensions of internal values, external values, and interpersonal values, was found relevant in the context of food purchase (Chryssohoidis and Krystallis, 2005), e-shopping behaviour (Jayawardhena, 2004), and adoption of new products (Daghfous *et al.*, 1999). However, the situational factors of brand preferences (Mulyanegara and Tsarenko, 2009), clothing purchase (Sudas and Paromita, 2007), complaint behaviour (Kau *et al.*, 1997), and mall shopping attitude and behaviour (Shim and Eastlick, 1988) reduced the LOV values to two

underlying dimensions, that of internal and external values. The findings of such studies generally indicate that appealing to values congruent with a particular marketing activity can provide an avenue for individuals to identify with the marketing offering.

Interest in the values students uphold in education is not new (Shorr, 1953) nor is the notion that a career is driven by personal values (Vigoda-Gadot and Grimland, 2008), but having a sophisticated tool to examine how values function in choice behaviour in education is. The LOV inventory provides a strong foundation from which to develop a PVIS scale. As is the case in most LOV research, parenthetical definitions were developed to better define the construct measured and applied to each of the values on the survey instrument (Kropp *et al.*, 2005). In strategic terms psychometrically sound and informed measurements of the values students uphold can allow educational institutions to attract and recruit students best matched to their program offerings (Carle *et al.*, 2009) as students' academic majors impact their learning and academic development (Pike, Smart and Ethington, 2011) and their career choices (Sargent and Domberger, 2007).

3. Research method

3.1 Construction of the scale

In order to construct the PVIS scale, a number of guidelines and procedures necessary for theory building and the development of a psychometrically sound PVIS multi-item scale directed the two-stage research approach (Churchill, 1979; Bearden and Netemeyer, 1999). The guidelines for Stage 1 included *item generation* and *purifying the measure*. To measure students' understanding of personal values, the way a convenience sample of students (N = 65) interpreted the nine LOV factors was examined in Stage 1, through open-ended and semi-structured questions (e.g. To me, *self fulfilment* means.....). As the objective for this stage was to generate statements and/or definitions to capture specified value dimensions for the nine LOV values, non-probability sampling was deemed useful particularly when addressing an existing issue from a new perspective. The relatively small numbers of respondents chosen was to assist a focus on depth of responses rather than breadth, with a sample chosen assumed to reflect the characteristics of the population of interest (Mason, Augustyn and Seakhoa-King, 2010). Stage 2 survey data

(N = 304) assessed scale dimensionality and served as a precursor to exploratory and confirmatory factor analysis for testing of the construct, convergent, and discriminate validities of the PVIS scale.

Stage 1 Development of a measurement instrument.

Item generation. First-year undergraduate business students (N = 65) majoring in marketing enrolled in their first semester at an Australian university participated in Stage 1. The item development phase (Brockway, Carlson, Jones and Bryant, 2002) generated just over 900 responses to the three questions pertaining to the nine LOV values on the survey.

Purifying the measure. To test for content and face validity of the scale items, a panel of six academics with knowledge and expertise in marketing were asked to match parenthetical statements and/or definitions to the nine value constructs. Driving this approach was the objective of refining the response pool to statements representative of the constructs which avoided jargon, difficult words, and ambiguous words (Bearden and Netemeyer, 1999). Forty-five parenthetical definitions were the outcome of consolidating responses displaying similar traits into category descriptors. For example, the value of *self fulfilment* generated common category descriptors such as “being happy”, “well balanced”, “achievement”, “satisfaction and completion” and “belief in one’s self”. The PVIS scale was constructed using a seven-point, Likert-type scale (1 = strongly disagree to 7 = strongly agree) to investigate the five definitions which best represented each of the nine values. A questionnaire pre-test was then conducted on a convenience sample of 30 second-year business students to validate the questionnaire’s wording of items, ease of completion, ordering of questions, and question applicability. The final statements are listed in Table 2.

Table 2

The Scale (PVIS) Parenthetical Statements

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
-

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

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

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

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.

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

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

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

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

Stage 2 Testing the PVIS scale

Participants in Stage 2 were undergraduate students (N = 304) enrolled in their first semester in particular degree programs at an Australian university. As elements of the population logically clustered into identifiable cohorts (faculties), a cluster sampling approach was used. Three faculties – business; design and social context (DSC) including arts, humanities and social sciences; and science and engineering technology (SET) represented the cluster. Respondents were asked to rate the extent to which they agreed with five parenthetical definitions constructed to measure each personal value. Approximately 450 self-administered surveys were distributed and collected in class time

by an independent assistant who gave a brief description of the research and instructions about how to complete the survey. Across the three faculties, the final sample size was 304 respondents, which indicates a 67 per cent response rate.

3.2 Descriptive statistics

Of the 304 responses, 42 per cent were from the business faculty, 29 per cent from DSC, and the remaining 29 per cent from SET. Participants were of almost equal gender representation (58 per cent male, 42 per cent female), and predominantly school-leavers reporting their age as 18 and 19. Over 80 per cent reported that they were born in Australia, with the second largest fraction born in Asia (18 per cent).

The descriptive analysis indicated that 80 per cent of all students enrolled in different faculties and degree programs showed a strong preference to values categorised under the internal value dimension with the value of *self fulfilment* ($M = 6.21$, $S.D. = 1.10$) rating as the most important value. Both DSC and SET students reported only internal values with the values of *self fulfilment* ($M = 6.36$, $S.D. = 0.935$; $M = 6.25$, $S.D. = 0.935$) and *sense of accomplishment* ($M = 6.00$, $S.D. = 1.06$; $M = 6.25$; $S.D. = 0.935$) respectively as the most important. Business students were the only cohort who reported the external value *sense of belonging* ($M = 6.00$, $S.D. = 1.31$) in their top five values of importance.

3.3 Exploratory factor analysis

Applying SPSS, the principal component analysis (PCA) was carried out to explore the underlying factors associated with nine items from the PVIS scale for a sample of 304 first-year undergraduate students. Listwise deletion of cases was used with missing values (Zhao and Gallant, 2012). By running a separate analysis for each construct to establish a single eigenvalue above one, convergent validity was also verified. A two-factor solution for the PVIS scale was extracted, explaining 63.3 per cent of the variances in the variables. The internal consistencies of the subscales were assessed with the use of Cronbach's α for each of the two indices (0.849 and 0.792). Both factors exceeded the 0.70 criteria (Nunnally, 1994), therefore demonstrating acceptable scale reliability. The application of the PVIS scale in an educational context identified the two dimensions of internal and external values (see Table 3). The values of VA, VB, VC, and VH related to *internally* oriented values, and included the value of VI (*interpersonal*) are termed

Internal values. Values VE, VG, VF, and VD related to *externally orientated* values and incorporated the value of VF (*interpersonal*) are termed *External values*. The factor solution output is consistent with the theoretical findings suggesting internal and external dimensions to personal values (Homer and Kahle, 1988).

Table 3

PVIS- Factor loadings of items

Construct	Component	
	Factor 1	Factor 2
	(Va) (Vb) (Vc) (Vh) (Vi)	(Vd); (Vg); (Ve) (Vf)
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
Alpha	.849	.792
Sum of squares (eigenvalue)	4.455	1.247

3.4 Confirmatory factor analysis: measurement models

Two measurement models of one-factor congeneric measurement models (Jöreskog and Sörbom, 1993) and a multifactor model were constructed using AMOS 7.0 initially to examine whether there was a relationship between the observed variables and their underlying latent construct(s). The second objective directed the testing of the measurement properties of the construct, convergent, and discriminate validities of the PVIS scale. The outcome of the initial review process of model specification and “goodness of fit measures”, resulted in retaining 37 items of the 45 items representing the nine LOV values. Inspection of fit indices of goodness-of-fit (GFI), Tucker-Lewis index (TLI), comparative fit index (CFI), and adjusted goodness of fit index (AGFI)

(respectively) for the one-factor congeneric models indicated a range of 0.942 to 1.0; root mean square error of approximation (RMSEA) also fell within an acceptable range indicating the error terms are small and acceptable (Hu and Bentler, 1999).

Table 4

One- Factor Congeneric Fit Statistics Model Fit (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	(6.9)	.030	.060	.989	.965	.954
Value (b) Self respect 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 4* I gain internal satisfaction for doing something right	2	(4.7)	.095	.067	.993	.980	.963
Value (d) Security 2* To be protected by someone or something is important to me	2	(6.0)	.049	.081	.990	.949	.981
Value (e) Sense of belonging 4* I always seek to be part of a community	2	(4.5)	.105	.064	.992	.982	.962
Value (f) Warm relationships 1* Being socially connected with others is important to me	2	(6.9)	.032	.061	.989	.974	.943
Value (g) Being well respected	5	(2.1)	.827	.000	.997	1.00	.992
Value (h) Fun and enjoyment in life 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	(1.3)	.508	.000	.998	1.00	.989
<u>Total of 37 retained from 45 items</u>							
<u>* Deleted Items</u>							

3.5 Two-factor measurement model

A two-factor measurement model (Figure 1), including all items for Internal and External dimensions, did not initially fit the data well ($\chi^2 = 124.2$ (d.f) = 26, $p = 0.000$). A subsequent two-factor model with the deletion of value (h) *fun and enjoyment* and value (d) *security* showed to be a more fitting model. An examination of the model fit statistics

suggests the data fit the model data well ($\chi^2 = 20.7$ (d.f) = 13, $p = 0.078$, RMSEA = 0.044, GFI = 0.981, TLI = 0.982, AGFI = 0.959) where the error terms (>0.05) are small and acceptable (Helgesen and Nessel, 2007). The final review of the PVIS scale culminated in the two dimensions of internal and external representing seven of the original LOV nine values (see Figure 1) as a valid measurement instrument in context of higher education.

Table 5

Two Factor Model

Scale	Fit Statistics						
	df	<i>p</i>	χ^2	RMSEA	GFI	TLI	AGFI
**Value (h) Fun and enjoyment in life							
**Value (d) Security							
<u>CFA: Two factor Model -Values</u>	13	.078	20.7	.044	.981	.982	.959
**Values Removed							

3.6 Scale reliability and validity

To assess the reliability and validity of the measurement models, the squared multiple correlations for the observed variables were reported. The reliability estimates of the one-factor congeneric models were verified using Cronbach's alpha values which ranged from 0.792 to 0.849, meeting on average the minimum hurdle of 0.700 suggested by Hair *et al.*, (1998). Convergent validity and discriminant validity for the PVIS scale indicated all the items across the factor models were sufficient in displaying these properties ranging from 0.55 to 0.86 (see Figure 1), and were all significant at the 0.01 level. These results show convergent validity was supported by the data for this paper. Discriminant validity of the measurement models on the values obtained for constrained and unconstrained models for two estimated constructs at a time (Anderson and Gerber, 1988) indicated significant changes in the chi-square test (see Table 6) implying distinct concepts (Helgesen and Nessel, 2007).

Figure 1

Two Factor Measurement Model

Table 6

Discriminant Validity

Constructs	Constrained χ^2 value	Unconstrained χ^2 value	Chi square difference test
Internal Values and External Values	df(14)65.1	df(13)20.8	df(1)44.3*

* Values significant at the 0.01 level

4. Findings and discussion

This study applied the construct of personal values in the context of higher education to develop a valid and reliable psychometric diagnostic tool to examine the relationship between personal values, program choices and potential future careers. The findings provide an Australian viewpoint on the personal values that first-year undergraduate

students hold in terms of their academic choices and their future workplace representation. Significantly, the importance of PVIS as a reliable and valid measure lies not only in its contribution towards establishing greater methodological rigour in measurement instruments, but also to the continual advancement of a research field (Slavec and Drnovsek, 2012).

In Stage 1, a series of statements translated the LOV values dimensions into parenthetical statements relevant for application in an educational context. The Stage 2 survey data validated the PVIS as an effective measure of two specific value dimensions, those of external and internal values, confirming that context can influence the number of dimensions of the LOV typology. That the two external values of *security* and *fun and enjoyment* and the third dimension of interpersonal were effectively jettisoned from the PVIS reflects a generation assimilated with social media, whose expectations of consumption are of entertainment mediated by online involvements (Bakewell and Mitchell, 2003). The students did not differentiate between *fun and enjoyment* in life and *excitement*, deeming the latter a more important and relevant value. It is almost a commonplace observation, but Gen Y have grown up in relative affluence, and tend to be confident and expressive (Kapoor and Solomon, 2011), and often disregard security as an important value, preferring living for the day over investing in concepts such as loyalty and commitment (Da Silva Anana and Nique, 2010). Their preference for job flexibility rather than long-term employment (Hurst and Good, 2009) further illustrates this point. It remains undetermined whether this profile would also be maintained in the case of students from differing socio-economic backgrounds or from countries where economic and personal security was not so certain.

Internal values of *self fulfilment*, *self accomplishment*, *self respect*, and *excitement* were recognised as important to most students within this generational cohort as demonstrated by their positive identification with this value dimension. Given this insight, educational marketers can use these predictors of preferential choice behaviour for strategy development. This research suggests that educational institutions wishing to attract prospective students from this cohort should focus in their marketing communications on the internal dimension represented by these values. By positioning degree programs as pathways to achieving a particular end goal as *self accomplishment* –

for example, “*finishing something [that] makes me feel content and satisfied*” – pursuing higher education can be viewed as a vehicle for attaining such goals. Students identifying internal values as important are more likely to be internally motivated, and to perceive a sense of control and influence over outcomes (Kahle, 1983). Further, such students tend not to require the judgments or confirmations of others. Patterns of similar response choices are not unusual within generational cohorts where the similar life events of their formative socialisation years tend to set them apart, resulting in a like-minded group (Mueller, Remaud, and Chabin, 2011). Lifestyle, experiences, and shared consumption patterns as part of psychological profiles become critical in shaping values, attitudes, and behaviours (Fountain and Lamb, 2011).

Similarly, among other findings, the results indicate student cohorts choose academic programs based on their values and preferences and these values typify some careers more than others (Da Silva Anana and Nique, 2010). Academic disciplines tend to be distinctive in fostering particular student career pathways. The fields of engineering, science and technology, as well as business, are designed to provide students with practical skills and job-related competencies (Goyette and Mullen, 2006), in contrast to liberal learning (including the arts, humanities and social sciences) which tends to espouse the pursuit of learning for its own sake rather than utilitarian purposes (Bennett, 2004). The results of this study suggest that students enrolled in SET and those in DSC have a values set that traditionally has been associated with business. When comparing business and engineering, science and technology, although there is an overlap in terms of acquiring analytical and technical skills and career paths, the students identify with different values and value statements. For example understanding that business students identified with both internal and external values, and deemed the internal value of *sense of accomplishment* as the most important value, should encourage marketers and course developers to position the degree program so as this cohort of students to attain a “*deep sense of satisfaction from achieving a personal goal*”. Business students’ affiliation with the external value of *sense of belonging*, aligning with the statement “*being welcomed and accepted for who I am gives me a deep sense of belonging*”, differentiates this cohort of students. Students identifying with external values were more likely to abdicate control and rely on external factors to drive future directions and outcomes (Kahle, 1983).

Compared to business, students enrolled in SET and DSC allocated importance only to internal values. SET students aligned themselves with the values of *sense of accomplishment* and *self fulfilment*, identifying with the statement of “*finishing something makes me feel content and satisfied*” and “*it is important to feel happy with yourself and where you are in life*”, respectively. Students enrolled in art and social science majors aligned with the values of *self fulfilment*, and desired to achieve to “*feel happy with yourself and where you are in life*”, and of *sense of accomplishment*, identifying with the statement “*finishing something makes me feel content and satisfied*”. Those seeking careers in the arts and social sciences have been portrayed as a group critical of the values of “stability, conformity and virtuosity”, displaying little interest in material wealth and being more directed towards beauty, excitement and freedom (Da Silva Anana and Nique, 2010). According to Madrigal (1995) internally oriented individuals tend to feel more self motivated and are rated highly by those individuals who believe they can influence or control outcomes. Past studies have affirmed significant associations between students’ values and their academic majors, suggesting that students who showed a preference for the social and behavioural sciences scored highly in social concern (Biddle, Bank and Slavings, 1990). Similarly, engineering students identified with “social responsibility” and “relevance to one’s own interests and concerns” as among some of the important drivers for enrolling in engineering degrees (Clark, 2011).

4.1 Limitations and further research

Unavoidably, limitations are inherent in any measurement instrument (Kitwood and Smithers, 1975). To enhance and refine the psychometric properties of PVIS as a diagnostic tool of significant values, it would be useful to undertake research in several directions. First, the scope of future samples could be broadened to include other universities with similar faculties, and then the same study could be repeated in these different contexts. Second, the removal of two of the original areas provides good opportunities for the further development of other value dimensions more relevant to this generational cohort.

Third, another potential area for further research would be to examine motivation with respect to why people elect arts and humanities courses. These enrolments are significant numerically and yet because they tend not to be the flagship programs of

universities like science, education and technology or business, they tend not to be associated with as much prestige or earning potential. Enrolments in arts and humanities will persist and to cater insufficiently for this segment of the market seems to be an organisational oversight. Lastly, while it is assumed that greater alignment between values, motivation and course choice would lead to better outcomes; this assumption is as yet unproven.

5. Conclusion and implications

The present study verified the application of PVIS in an educational context. The scale development process produced two distinct dimensions of internal and external values that demonstrated reliability and validity. This understanding of the dimensions of PVIS will allow researchers to explore the link between these two variables and other potential factors that may influence students' preferences. Previous empirical evidence has shown personal values shape choices (Kropp *et al.*, 2005). The findings here contribute to the discourse dealing with the importance of understanding and aligning students' values to their academic and career choices (Singh *et al.*, 2011; Greenbank, 2011; Da Silva Anana and Nique, 2010).

There are implications in terms of the relationship between students' personal values and the course design as individuals who have similar value systems tend also to share similar behaviours (Maio, and Olson, 1994). Understanding which personal values matter to students can enable universities to improve and develop areas of the curriculum and associated appropriate teaching methods (Bolton and Lane, 2012) with the goal of better motivating students towards course completion. For example, incorporating student team projects in a business program for business-oriented students would acknowledge the importance these students allocate to the value of *sense of belonging* and their desire to receive "recognition" and "acceptance". As a validated measurement instrument, PVIS has applicability in other service sectors where personal values serve as criteria for individuals to evaluate the benefits accrued from service offerings. Additionally PVIS can provide information as to why consumers choose a service or service provider.

The insights from this study have practical implications as well for the use of the PVIS instrument by researchers, educators, and career planners. The analytical utility of the PVIS scale can inform educational institutions seeking a way to more effectively align student values at enrolment, their choice of courses and their career paths upon graduation. This information could be of great benefit to education agents and careers advisors, who could, for example, as part of a degree entrance discussion, suggest potential career gateways and course majors not only at an undergraduate level but at postgraduate level as well (Sing *et al.*, 2011). Getting students to consider their important personal values allows them at an early stage of selection to make informed choices, particularly for those whose career and/or degree preference may not be planned (Willis *et al.*, 2009). The PVIS scale allows particular faculties to better position course material offerings for their student cohort. Aligning course and career choices to value preferences can be instrumental in directing students towards specialised vocational fields that present long-term rewards and career development.

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