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Jae Yup Jung

University of New South Wales, jyupjung@yahoo.com

John M. McCormick

University of Wollongong, johnmcc@uow.edu.au

Gary Gregory

University of New South Wales

Kerry Barnett

University of New South Wales

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Culture, Motivation, and Vocational Decision-Making of Australian Senior High School Students in Private Schools

Jae Yup Jung,¹ John McCormick,² Gary Gregory,³ and Kerry Barnett¹

¹ School of Education, The University of New South Wales, Australia

² Faculty of Education, University of Wollongong, Australia

³ School of Marketing, The University of New South Wales, Australia

The purpose of this study was to investigate the roles of culture and motivation in the occupational decisions of senior high school students attending private schools. A theoretical framework guided the study. A questionnaire was administered to 492 Grade 11 students attending a stratified random sample of six independent (private) schools located in the Sydney (Australia) metropolitan area. Structural equation modelling was performed on the data collected. The major findings of the study centre on a new model of vocational decision-making, which provides empirical support for relationships between cultural orientation variables, expectancy-value variables, and related constructs. The findings may be used to advise senior high school students making occupational decisions.

■ **Keywords:** culture, motivation, vocational decision-making

Vocational decision-making has been studied by scholars in a number of fields, including psychology, education, and sociology. Today, some of the most influential vocational decision-making theories include the trait and factor theories, the developmental theories, the social learning theories, and the postmodern theories (Brown, 2002). Duffy and Sedlacek (2007a) noted that a unifying theme among the various models that explain career choice 'is an emphasis on person-centered variables' (p. 591). A small number of theories, such as the social learning theories, give explicit acknowledgement to influences such as the social setting of the decision-maker (Brown, 2002; Johnson & Mortimer, 2002).

Many of the influential vocational decision-making theories, and their derivatives, do not appear to give full consideration to the roles of culture and motivation in vocational decision-making processes (e.g., Holland, 1997).

ADDRESS FOR CORRESPONDENCE: Jae Yup Jung, School of Education, The University of New South Wales, Sydney NSW 2052, Australia . E-mail:jae.jung@unsw.edu.au

Moreover, they seem to be largely based on a Eurocentric perspective, with minimal sensitivity or relevance to other groups (Brown, 2002; Stead, 2004). There appears to be a need for more psychological and social perspectives, including cultural and motivational perspectives, to be investigated, to enable a clearer and a more complete understanding of the phenomenon of vocational decision-making.

Review of the Literature

Culture

Culture has been defined in a number of different ways (Hofstede, 2001; House et al., 1999; Triandis, 1996). Of the various approaches used to study culture (e.g., Hofstede, 2001; House et al., 1999; Schwartz, 1999), the classification system developed by Hofstede (2001), which recognises individualism/collectivism and long-term orientation as cultural dimensions, has achieved wide acceptance.

Individualism/collectivism. Individualism may be described as the notion of autonomy and independence, while collectivism refers to the notion of people being interdependent with one another (Triandis, Chan, Bhawuk, Iwao, & Sinha, 1995). Both individualism and collectivism refer to phenomena at the level of culture, and idiocentrism and allocentrism are terms that are used to refer to individualism and collectivism, respectively, at the level of the individual (Triandis, 1995). We posit that senior high school students' levels of idiocentrism and allocentrism are likely to be related to their occupational choices.

Long-term orientation. Long-term orientation has been defined by Hofstede (2001) as the 'fostering of virtues oriented toward future rewards' (p. 359). Individuals with long-term orientation tend to exhibit future-related attributes such as planning, hard work for future benefit, substantial savings, and a willingness to make sacrifices for a purpose (Bearden, Money, & Nevins, 2006; Peterson, Dibrell, & Pett, 2002). Occupation is one domain that is likely to be prominent in the thinking of long-term oriented adolescents (Greene, 1990; Heinz & Kruger, 2001; Nurmi, 1989).

Motivation

Like culture, motivation is a complex and broad concept, which has multiple definitions. Although many motivational theories exist, expectancy-value theory and the theory of reasoned action may be particularly relevant to the context of this study.

Expectancy-value theory. Expectancy-value theory (Eccles & Wigfield, 2002; Wigfield & Eccles, 2000) suggests that motivation is determined by both the future expectancies and values of individuals. The theory in its most general form posits that 'individuals' expectancies for success and the value they have for succeeding are important determinants of their motivation to perform different achievement tasks' (Wigfield, 1994, p. 50). If the theory is applied to vocational decision-making, it may be argued that individuals who expect to be successful in a particular occupation, and value certain aspects of the occupation, would be likely to choose, and expend efforts to pursue, that occupation. Indeed, Battle and Wigfield (2003) successfully used expectancy-value theory to study female value

orientations toward careers. In their study, 'intrinsic-attainment', 'utility' and 'cost' values were found to be significant predictors of a career-related intention (i.e., intention to commence postgraduate studies).

Theory of reasoned action. The theory of reasoned action attempts to provide a parsimonious explanation for the fundamental bases and determinants of human behaviour (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975; Westaby, 2005). It states that personal attitudes and perceived or subjective norms jointly predict intentions toward particular behaviours, which in turn, predict these behaviours. Although the theory was not specifically developed for situations involving choice or decision-making among alternatives or goals, it has nevertheless been shown to apply to such situations (e.g., Sheppard, Hartwick, & Warshaw, 1988).

Decision-Making/Vocational Decision-Making

One approach to studying vocational decision-making, or vocational choice, is to conceptualise it as a part of the broader field of decision-making. Many theories of decision-making exist, although one, the rational choice theory, appears quite influential today (Morcol, 2007). In this theory, the assumption is made that the decision-maker is a rational, independent being, who makes decisions logically, and with full information about available options and consequences, in a self-interested, utility maximising, and stable manner. Nevertheless, critics of the theory have pointed to the influence of factors that may co-exist with rationality to influence decision-making, such as motivation (Morcol, 2007), norms (Hastie & Dawes, 2001; Morcol, 2007; Zey, 1992), altruism (Zey, 1992), biases (Morcol, 2007), personal experience (Hastie & Dawes, 2001; Morcol, 2007), emotion (Hastie & Dawes, 2001; Morcol, 2007; Zey, 1992), morality (Morcol, 2007), and expectations (Morcol, 2007). It appears, therefore, that both rational and nonrational influences will need to be given full and careful consideration to more completely reflect how decisions, including vocational decisions, are made.

Theoretical Framework

A schematic representation of the theoretical framework that guided this study is shown in Figure 1.

Cultural orientation variables (i.e., idiocentrism, allocentrism, and long-term orientation) are incorporated into the theoretical framework for their relevance to decision-making, while expectancy-value variables (i.e., expectancy for occupational success, recognition, occupational interest/enjoyment, and occupational income) are also included, as they may be considered constructs related to the prediction, or attractiveness, of choice options (Duffy & Sedlacek, 2007b; Wigfield & Eccles, 2000). These variables are proposed to predict the personal (occupational) attitudes of, and perceived social influences (i.e., perceived influences from important others, such as the family) on, senior high school students faced with occupational decisions. Consistent with the theory of reasoned action, personal (occupational) attitudes and social influences from the family, are, in turn, proposed to jointly contribute to the occupational intentions of senior high school students.

FIGURE 1
Schematic representation of the theoretical framework.

Broadly, the theoretical framework includes rational and nonrational decision-making perspectives. It encompasses rationality, in that the vocational decision-maker is conceptualised as being logical, self-interested, and stable (Morcol, 2007). Nevertheless, by incorporating culture and motivation, it also acknowledges other influences (Hastie & Dawes, 2001; Morcol, 2007; Zey, 1992). Some elements of existing vocational decision-making theories have also been incorporated. The need for a ‘fit’ between the person and the occupation, from the trait and factor theories of vocational choice (e.g., Holland, 1997), has been partially acknowledged by the linkage of occupational values to occupational choice. Moreover, ‘expectancies for success’ and ‘social influence’ are constructs that are related to those that have previously been used in Lent, Brown, and Hackett’s (1994) social cognitive career theory and the social learning theories of career choice (e.g., Krumboltz, 1979).

Hypotheses

The 12 hypotheses of the study, which correspond with the paths proposed in the theoretical framework (see Figure 1), follow. Preceding each hypothesis, or groups of hypotheses, are the associated theoretical arguments. Propositions similar to Hypotheses 1 and 2 have previously been noted by scholars of vocational decision-making (e.g., Brown, 2002).

First, the cultural constructs idiocentrism/allocentrism may determine the degree of perceived social influence that is experienced by senior high school students in their vocational decisions. Senior high school students who display high levels of allocentrism may see themselves as being part of an in-group comprising people who are important to them. The preferences, goals, and norms of this in-group are likely to prevail over individual preferences, goals, and norms (Triandis, 1995). Consequently, important in-groups of such students (such as the immediate family) may prove to be highly influential in any decisions that concern the students, including decisions about their future occupations. The opposite may be true for senior high school students with high levels of idiocentrism.

Hypothesis 1: Allocentric orientation will positively predict social influence-family.

Hypothesis 2: Idiocentric orientation will positively predict occupational attitude.

Idiocentrism/allocentrism may also have a role in predicting the occupational values that are held by senior high school students. People with high levels of idiocentrism, who by definition are primarily motivated by their own personal preferences and goals (Triandis, 1995), may value interest or enjoyment in an occupation, as interest or enjoyment may have a role (at least in part) in determining an individual's personal preferences and goals. In contrast, people with high levels of allocentrism, may be more concerned about affirming their membership of in-groups by gaining recognition from fellow in-group members with respect to their occupations.

Hypothesis 3: Idiocentric orientation will positively predict occupational interest/enjoyment.

Hypothesis 4: Allocentric orientation will positively predict recognition.

People with a long-term orientation or a future time perspective, are likely to be concerned about their future, and being in a position to address possible issues and events in their future, such as education, occupation, marriage, parenting, and the purchase of property (Greene, 1990; Nurmi, 1989). In order to adequately address such concerns, long-term-oriented individuals may consider it necessary to have a high level of income. Relatedly, with a focus on the future, it is also likely that people with a long-term orientation will make active efforts to achieve future success, and consequently expect to be more successful in future activities (including occupation-related activities), generally.

Hypothesis 5: Long-term orientation will positively predict occupational income.

Hypothesis 6: Long-term orientation will positively predict expectancy for occupational success.

Occupation-related values may have a role in the prediction of attitudes toward occupations. Eccles and Wigfield (1995) suggest that values may relate to 'fundamental' beliefs about whether an activity will fulfil one's needs, confirm one's self-schema, achieve one's goals and/or produce positive affect. Therefore, it may be argued that values related to occupations (e.g., occupational interest/enjoyment,

recognition, and occupational income) will *precede* the formation of less ‘enduring’ personal attitudes or views toward occupations (i.e., occupational attitude).

Hypothesis 7: Occupational interest/enjoyment will positively predict occupational attitude.

Hypothesis 8: Recognition will positively predict occupational attitude.

Hypothesis 9: Occupational income will positively predict occupational attitude.

Expectancies for occupational success may also be related to the formation of attitudes toward occupations. The argument may be made, for example, that high expectancy for success in a future occupation is likely to be associated with positive affect, which may lead to the formation of positive attitudes toward that occupation. Festinger’s (1957) cognitive dissonance theory suggests that the positive or negative affect associated with expectancy for success in an occupation, is likely to be matched by respective positive or negative attitudes toward the occupation.

Hypothesis 10: Expectancy for occupational success will positively predict occupational attitude.

Independent of the influence of culture, an individual who experiences social pressures from significant others, such as immediate family members, to pursue a certain occupation, may be more likely to form intentions to pursue that occupation, than individuals who do not experience such pressures. It is also probable that, independent of culture, an individual who has a positive attitude toward a particular occupation may be more likely to form intentions to pursue that occupation, than an individual who does not have similar attitudes. The proposed relationships between social influence-family and occupational intention, and between occupational attitude and occupational intention, were adapted from the theory of reasoned action.

Hypothesis 11: Social influence-family will positively predict occupational intention.

Hypothesis 12: Occupational attitude will positively predict occupational intention.

Method

The research reported here was part of a larger study of the occupational decision-related processes of Australian senior high school students, which included investigations of the occupational decision-related processes of students attending different school systems/sectors in Australia, and students who may be amotivated with the occupational decision (Jung & McCormick, 2010).

Sample

A survey instrument specifically developed for this study was administered, in classroom settings, to 492 Grade 11 students attending a stratified random sample comprising six independent (private) schools located in the Sydney metropolitan area. To arrive at the final selection of schools, member schools of the Association for Independent Schools of New South Wales (AIS) were initially stratified by school category (e.g., traditional Anglican, Catholic, Uniting, etc.).

Thereafter, randomly selected schools from each category were sequentially added to the sample to reflect relative student enrolments in each category. The AIS notes on its website (2010, ¶ 2) that the independent (private) school sector accounts for almost 15% of total student enrolments in the state of New South Wales. As the total number of Grade 11 students in the selected schools was 898, a 55% return rate was achieved. Grade 11 students were chosen, as vocational decision-making was likely to be salient for these students. In Australia, the vocational decision is unlikely to be delayed substantially beyond Grade 12, as financial independence is generally expected in early adulthood, and as the tertiary education system requires relatively early decisions about study specialisation.

The participants were aged between 15 and 17, and mostly Australian-born (86%). There were more females (57%) than males. The median socioeconomic status of the participants, as measured by the maximum ANU4 (The Australian National University 4) rating (Jones & McMillan, 2001) of the occupations of the father, mother, and/or guardian of the participants, was at a level equivalent to a 'nursing professional', which is below the level of many other professionals, but above the level of trade persons, clerical workers, and labourers. Fifty-nine per cent of the participants had Anglo-Saxon or Celtic ancestry, while 8% had East Asian, 8% had non-Anglo-Saxon Western European, 7% had Middle Eastern, 5% had Southeast Asian, and 8% had mixed ancestry. Ninety-eight per cent were either Australian citizens or permanent residents.

Development of the Survey Instrument

The survey instrument was designed to assess the attitudes, beliefs, and opinions of senior high school students (i.e., idiocentrism, allocentrism, long-term orientation, expectancy for occupational success, occupational interest/enjoyment, occupational income, recognition, social influence-family, occupational attitude, and occupational intention) with respect to the job/occupation that they were most likely to pursue upon graduation from high school, along with some sociodemographic characteristics (i.e., age, gender, place of birth, ancestry, and parental/guardian occupation). The scales and measures used in a number of studies, discussed below, were examined during the development of this instrument.

Idiocentrism/allocentrism. Three items from one of the subscales of Hui's (1988) Individualism-Collectivism (INDCOL) Scale, the 'parent' subscale, appeared to be compatible with the measurement of cultural orientations of adolescents faced with the occupational decision. These items (e.g., 'When making an important decision, I seldom consider the positive and negative effects my decisions have on my father') were incorporated into the questionnaire with subtle modifications (i.e., 'When making an important decision, I seldom consider the positive and negative effects my decisions have on my *parents*'). Hui (1988) noted adequate reliability (i.e., test-retest, split-half, Cronbach, and Guttman reliabilities across two samples were, on average, greater than .70) and validity (e.g., 58 of the 63 items in the INDCOL Scale were found to adequately discriminate between individualists and collectivists, according to a panel of 41 experts; statistically significant and positive correlations were generally found with the related Social Interest Scale) of the 'parent' subscale. Grimm, Church, Katigbak, and Reyes (1999) also reported that the INDCOL Scale had adequate psychometric properties.

The three items were supplemented with items used in Brew, Hesketh, and Taylor's (2001) study, which required participants to respond to a series of vignettes (one of which related to career decision-making) by selecting from three collectivist and three individualist responses originating from the INDCOL Scale. An example of a response was 'I am responsible for my own future'. Five of the six responses were used, without alteration, to measure the idiocentrism/allocentrism of the participants of the study.

Long-term orientation. The 'valence' scale of the future time perspective measure used by Shell and Husman (2001) assessed the 'relative importance of attaining immediate versus long-range future outcomes' (p.489), and were considered appropriate for measuring the long-term orientations of adolescents contemplating occupational decisions. Those items with five of the highest factor loadings on this scale were selected for inclusion in the new instrument (e.g., 'Given the choice, it is better to get something important in the future than something you want today'). Shell and Husman (2001) noted that the items had reasonable reliability (Cronbach's alpha of .77), and discriminant validity with the 'connectedness' scale of the future time perspective measure.

The items were supplemented with Robertson and Hoffman's (2000) instrument, which measured Hofstede's five dimensions of culture. Seven of the eight items in the Confucian dynamism/long-term orientation subscale were composed in a manner considered comprehensible to a Western audience, and appropriate for measuring the long-term orientation of adolescents contemplating an occupational decision. Nevertheless, as the items were specific to a managerial context, slight modifications were necessary (e.g., from 'Managers must be persistent to accomplish objectives' to '*People* must be persistent to accomplish objectives') prior to their inclusion in the new instrument.

Occupational interest/enjoyment. Noels, Clement, and Pelletier (1999) used a questionnaire, adapted from the widely used Academic Motivation Scale (e.g., Vallerand et al., 1993), to measure intrinsic and extrinsic motivation of students (among other constructs) attending a language program. One item in the scale relating to 'satisfaction' was adapted for content specificity prior to its incorporation into the new instrument (i.e., 'It is very important for me to be satisfied in this job/occupation').

Recognition/occupational income. The seventh version of the Work Preference Inventory was used by Amabile, Hill, Hennessey, and Tighe (1994) to assess differences in intrinsic and extrinsic motivational orientations. Six items related to recognition and salary appeared compatible with the constructs 'recognition' and 'occupational income' in the present study, and were adapted for use in the new instrument (e.g., 'I want other people to find out how good I really can be at my work' was modified to 'I want other people to find out how good I really can be in this job/occupation'). Amabile et al. (1994) noted that the 'extrinsic motivation' subscale of the Work Preference Inventory from which the six items originated, had adequate reliability (i.e., Cronbach's alpha of .70 and .78, and test-retest reliabilities of .94 and .80) and validity (i.e., significant and positive correlations with related scales such as the General Causal Orientations Scale).

Mills and Blankstein (2000) also noted that the Work Preference Inventory had 'adequate internal consistency, good short-term test-retest reliability, and good longer term stability' (p.1195), while Fairchild, Horst, Finney, and Barron (2005) suggested that the instrument had adequate validity.

Expectancy for occupational success. Eccles, Wigfield, and colleagues developed measures of constructs in the expectancy-value theory of motivation (Eccles & Wigfield, 1995; Wigfield & Eccles, 2000). Some items used to measure expectancy for success in the Self- and Task-Perception Questionnaire (Eccles & Wigfield, 1995; e.g., 'Compared to other students, how well do you expect to do in math this year') were considered appropriate for measuring 'expectancy for occupational success', with modification to suit the different context (i.e., 'One of the most important things is that I expect to do well in this job/occupation relative to others'). Four items derived from this instrument (including one item related to occupational interest/enjoyment) were incorporated into the new instrument. The subscales from which the items were derived appeared to have 'fair' reliability (i.e., Cronbach's alphas of .62 to .92; Eccles & Wigfield, 1995).

Occupational attitude/social influence-family/occupational intention. The items developed by Ajzen and Fishbein (1980) to measure elements of the theory of reasoned action, described as a 'well-established protocol' to assess theory of reasoned action constructs (e.g., Tedesco, Keffer, & Fleck-Kandath, 1991, p. 344), were considered suitable for measuring the constructs occupational intention, occupational attitude, and social influence-family after adaptation. While retaining key stems from the original items, such as 'I intend to ...', content adaptations were necessary (i.e., 'I intend to pursue this job/occupation'). Moreover, in line with the work of Lee and Green (1991), the items measuring perceived social influences were modified to specify actual referent groups (e.g., from 'Most people who are important to me think that I should pursue this job/occupation' to 'My family thinks that I should pursue this job/occupation'). In total, four items derived from Ajzen and Fishbein (1980) were incorporated into the survey.

The items were supplemented with three items used by Ajzen and Driver (1992; one of which was used to measure expectancy for occupational success). One item that assessed behavioural intention (i.e., 'I plan to engage in this activity in the next six months') had face validity for measuring occupational intention, and was modified for use in the new instrument (i.e., 'I plan to apply [or seek the required education/training] for this job/occupation'). An item measuring subjective norms (i.e., 'Most people who are important to me approve/disapprove of my engaging in this activity') was also modified (i.e., 'My family approves of this job/occupation') to assess social influence-family.

A final source for the social influence-family variable was the scale used by Fitzmaurice (2005) to measure consumer motivational behaviour based on a theory derived from the theory of reasoned action. The items that comprised a subscale used to measure subjective norms (e.g., 'The people who I listen to could influence me to do this activity'), which were similar to those used by other researchers (e.g. Bagozzi, Lee, & Van Loo, 2001), appeared to be valid measures of social influence-family after modification (i.e., 'My family influences me to pursue this job/occupation'). Four items in the new instrument were derived from

items in this subscale. Fitzmaurice indicated that the items were reliable (i.e., Cronbach's alpha in excess of .87) and valid (i.e., variance extracted value in excess of .50).

Although many items in the survey originated from existing instruments, these were also supplemented with 22 new items, to ensure that an adequate number of items existed to assess each construct. An example of a newly developed survey item was 'I look forward to raising a family when I am older'. All newly developed items were checked by subject matter experts for appropriateness and face validity prior to their inclusion.

A pilot study, undertaken with Grade 11 students ($N = 14$) to assess the appropriateness and clarity of the draft instrument, resulted in some minor modifications. The pilot study also contributed three new items ('I anticipate that employers will select me for this job/occupation', 'I expect to be successful in gaining entry into any educational/training courses required for this job/occupation', and 'This job/occupation will allow me to pursue my interests'). The refined instrument consisted of 67 items that were relevant to this study, which were to be responded to on a Likert-type scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*).

Method of Analysis

LISREL 8.80 was used to specify and estimate measurement and structural equation models. Initially, an attempt was made to confirm the theoretical framework with the data. Thereafter, a model-generating approach was adopted; model modifications and re-estimations, and a re-evaluation of the a priori reasoning and theory, contributed to a better-fitting, and justifiable, structural equation model of vocational decision-making.

Results

The maximum likelihood (ML) method of estimation was chosen to test, using a random half sample of the collected data, individual measurement models of the 10 variables of interest to the study. Diagonally weighted least squares (DWLS) estimation was not used, as it seemed that asymptotic covariance matrices could not be readily generated due to the size of the half samples. Initially, all the questionnaire items that were designed to assess each variable were incorporated into putative measurement models. To optimise the fit of these models, they were then re-specified by the progressive removal of problematic items. The second random half sample of data was used to confirm each measurement model thus developed.

Upon the development of a full measurement model that combined the 10 abovementioned individual measurement models without any cross-loadings ($\chi^2 = 1,621.60$, $df = 515$, $p = .0$; $\chi^2/df = 3.15$; RMSEA = .07; NFI = .91; NNFI = .93; CFI = .94; GFI = .81; AGFI = .77), a structural equation model of the theoretical framework was estimated, using ML estimation. The overall fit ($\chi^2 = 2,177.57$, $df = 545$, $p = .0$; $\chi^2/df = 4.00$; RMSEA = .09; NFI = .88; NNFI = .90; CFI = .91; GFI = .76; AGFI = .73) of the model was not acceptable.

The initial structural model was consequently re-specified. First, five statistically significant paths were sequentially added to the model, after examination of

the standardised residuals and modification indices. The theoretical justifications for each of the path additions follow.

1. Occupational interest/enjoyment to expectancy for occupational success: interest in an occupation, or the feeling that one will enjoy an occupation, generally may be perceived by these adolescents as a pre-requisite for persisting or continuing in an occupation (as it may be difficult to remain in an uninteresting/unenjoyable occupation), and consequently, eventual success in that occupation.
2. Social influence-family to occupational interest/enjoyment: some vocational decision-makers may 'internalise' family influences on the vocational decision-making process by developing an interest in (or a feeling of enjoyment for) occupations that are preferred by family members.
3. Occupational income to recognition: income may be perceived as evidence of having one's work recognised.
4. Occupational income to occupational interest/enjoyment: although an occupation may be simultaneously interesting/enjoyable *and* financially rewarding, a perception may exist that such occupations are rare, or that obtaining a position in such occupations may be difficult due to high levels of competition. Therefore, it may be considered necessary to make a choice between occupations that are interesting/enjoyable and those that are associated with high income. Consequently, occupational income and occupational interest/enjoyment may be negatively related.
5. Recognition to occupational interest/enjoyment: recognition from others may motivate vocational decision-makers to develop an interest in (or enjoyment for) a particular occupation. Alternatively, vocational decision-makers who value recognition from others may feel that such valuing will only be socially justifiable if it contributes to the development of an interest (or enjoyment) in a particular occupation.

The statistically nonsignificant paths that remained after the five paths were added (i.e., from long-term orientation to expectancy for occupational success, from social influence-family to occupational intention, and from allocentrism-family to recognition) were then sequentially trimmed. While the re-specified model had superior fit ($\chi^2 = 1,733.45$, $df = 543$, $p = .0$; $\chi^2/df = 3.19$; RMSEA = .07; NFI = .91; NNFI = .93; CFI = .94; GFI = .80; AGFI = .77) to the initial model, it was still not accepted, due to the relatively low GFI and AGFI statistics.

A possible explanation for the depressed GFI and AGFI statistics may have been their sensitivity to the non-normality of the data collected in the study. ML estimation had been employed for the structural model for consistency with the method used to estimate the measurement models with the half-samples, but may not have been the most appropriate procedure for the full sample model. To test this proposition, we re-estimated the model developed using the ML procedure using an estimation procedure considered more robust for non-normal data, DWLS (Hair, Black, Babin, & Anderson, 2010), with the full sample. Figure 2 shows this model after well-fitting individual and full measurement models of the associated constructs were re-estimated using the DWLS procedure (Appendix A shows the means, standard deviations, factor loadings, and error variances of the

FIGURE 2

Final structural model (DWLS).

items that comprised the full measurement model; Appendix B shows the goodness of fit indices of the full measurement model). Two statistically nonsignificant paths (i.e., from expectancy for occupational success to occupational attitude, and from idiocentrism-future to occupational attitude) were trimmed. The fit of the re-estimated structural model ($\chi^2 = 973.58$, $df = 512$, $p = .0$; $\chi^2/df = 1.90$; RMSEA = .05; NFI = .95; NNFI = .97; CFI = .98; GFI = .96; AGFI = .96) was very good, and was consequently accepted as the final model.

Table 1 shows the correlations between the variables in the final structural model, and their Cronbach's alpha values. The composite reliability values of all 10 factors were at least .62 (i.e., allocentrism-family = .86; long-term orientation = .75; idiocentrism-future = .62; occupational intention = .85; social influence-family = .87; expectancy for occupational success = .76; occupational income = .78; occupational interest = .82; recognition = .80; occupational attitude = .84). In order to test for discriminant validity, items of variables with correlations greater than .70 were combined into single factor competing models and compared with their matching two factor models. Generally, the two factor models were found to have superior fit (see Appendix C).

Discussion

The final structural equation model provides insights into the vocational decision-making processes of the senior high school students who participated in the study. The model has a number of path sequences. First, it suggests that the greater the idiocentric orientation toward the future, or allocentric orientation toward the family, the more likely these students were to value interest/enjoyment in an occu-

TABLE 1

Factor Correlations with Cronbach's Alpha on the Diagonal

	1	2	3	4	5	6	7	8	9	10
1 Allocentrism-family	.83									
2 Long-term orientation	.12	.71								
3 Idiocentrism-future	.11	.36*	.52							
4 Social influence-family	.35*	.05	.04	.85						
5 Occupational income	.15*	.27*	-.01	.08	.71					
6 Expectancy for occupational success	.15*	.01	.45*	.48*	-.10	.64				
7 Recognition	.12*	.24*	-.07	.01	.61*	.15*	.78			
8 Occupational interest/enjoyment	.14*	-.02	.44*	.33*	-.37*	.84*	-.01	.76		
9 Occupational intention	.08	.13	.36*	.44*	-.20*	.88*	-.05	.87*	.80	
10 Occupational attitude	.14*	.13*	.36*	.48*	-.17*	.89*	-.01	.89*	.96*	.78

Note. * $p < .01$

pation (with social influences from the family mediating the path from allocentrism-family to occupational interest/enjoyment). In turn, the model suggests that the greater the valuing of interest/enjoyment in an occupation the more likely is the formation of positive attitudes toward the putative occupations, and eventually, intentions to pursue these occupations.

The other major path sequence suggests that the greater the long-term orientation, the more likely income is valued, which is then likely to predict either: (a) the nonvaluing of occupational interest/enjoyment, or (b) if mediated by the valuing of recognition from others, the valuing of occupational interest/enjoyment. In turn, and as for the other two major path sequences, the valuing of occupational interest/enjoyment is likely to predict the formation of positive attitudes toward the putative occupations, and intentions to pursue these occupations. The strongest paths in all the major path sequences (i.e., from occupational interest/enjoyment to occupational attitude, and from occupational attitude to occupational intention) highlight the prominence of occupational interest/enjoyment and occupational attitude in the occupational decision-making processes of the participants. A number of other path sequences exist, some of which start at the cultural orientation variables and terminate at expectancy for occupational success, without leading to occupational intention.

The final accepted structural model is broadly similar, in many respects, to the original theoretical framework. For example, the cultural orientation variables (i.e., idiocentrism-future, allocentrism-family, and long-term orientation) predict expectancy-value constructs, which in turn predict occupational attitude, and eventually occupational intention. Moreover, the final model comprises the same (or similar) 10 constructs that were originally posited in the theoretical framework. Nevertheless, the final accepted model suggests stronger mediating roles for constructs such as occupational interest/enjoyment and occupational attitude than previously theorised. Additionally, social influences from the family appears as only an indirect predictor of occupational intention, and expectancy for occupational

success is not directly associated with occupational attitude or intention. Finally, the three occupational values have interesting inter-linkages that were not anticipated.

Despite the differences between the original theoretical framework and the final structural model, six of the original 12 hypotheses were supported. Support was found for Hypothesis 1 ('Allocentric orientation will positively predict social influence-family'), as a statistically significant positive relationship was identified between allocentrism-family and perceived social influence-family. The finding suggests that, with respect to occupational choice, people who are allocentric are likely to be influenced by the norms and wishes of the in-groups that are most meaningful to them (e.g., their families). The result is consistent with research by Brown (2002), Leong and Gim-Chung (1995), and Leong and Serafica (1995), who suggested that there was a greater likelihood of people from collectivist cultures relying on parents for their occupational decisions.

Hypothesis 3 ('Idiocentric orientation will positively predict occupational interest/enjoyment') was also supported. A possible interpretation is that participants with high levels of idiocentrism were likely to emphasise personal preferences, needs and goals (Triandis, 1995), which may be derived from the occupation-related activities, fields and/or subject matter that bring personal interest or enjoyment to the participants. The analysis also provided support for Hypothesis 5 ('Long-term orientation will positively predict occupational income'). It is possible that the participants who were likely to be concerned about future events, such as the raising of a family, or the purchase of property, may have been likely to value the income that is achievable in an occupation.

Of the hypotheses related to occupational values, Hypothesis 7 ('Occupational interest/enjoyment will positively predict occupational attitude') and Hypothesis 9 ('Occupational income will positively predict occupational attitude') were supported. The final structural model suggests that a vocational decision-maker's interest in an occupation, or the enjoyment that he or she believes will be gained from an occupation, may play a role in the formation of attitudes toward the occupation. Similarly, the statistically significant path between occupational income and occupational attitude, suggests that the valuing of the income achievable in an occupation may contribute to the formation of occupational attitudes. Both hypotheses support the notion, derived from an integration of elements of expectancy-value theory and the theory of reasoned action, that the values held by these senior high school students may have determined their personal attitudes toward occupations.

Similarly, Hypothesis 12 ('Occupational attitude will positively predict occupational intention') was supported. The result suggests that the research participants' attitudes toward occupations may have played a role in the formation of intentions to enter particular occupational fields. The statistically significant positive path between occupational attitude and occupational intention provided support for one of the major relationships in the theory of reasoned action, and is broadly consistent with the conceptualisation of motivation by Porter, Bigley, and Steers (2003) as a phenomenon that 'directs/channels' behaviour. The other six hypotheses (i.e., Hypotheses 2, 4, 6, 8, 10, and 11) were not supported by the final model.

Limitations

The study has some limitations, which need to be taken into consideration when its findings are interpreted. First, although there is evidence that the survey instrument was generally reliable, it may be refined further in future studies with new samples, to better assess and incorporate the constructs being measured. Second, as the data collected relied exclusively on self-reports by participants, there is potential for single source bias. Additional data sources, such as data on the perceptions of significant others (including parents, teachers, and career counsellors) and qualitative participant responses to open-ended interviews, may have provided additional validation to the findings. We also emphasise that causal inferences should not be made about the relationships in the structural equation models estimated, as the conditions for establishing causality (e.g., Hair et al., 2010) have not been fully met. A longitudinal study may be necessary before any claims for causality may be credible. We acknowledge that not all the variables that may be related to the vocational decision-making processes of senior high school students, were investigated. It is, therefore, not possible to claim that the model provides a complete picture of the vocational decision-making processes of senior high school students. Furthermore, as the sample of the study was drawn from the population of independent sector schools in the Sydney metropolitan area, additional testing with other high school populations is advised before the results may be confidently generalised beyond this population. Last, the final structural equation model is one of many possible models of the vocational decision-making processes of senior high school students. However, we emphasise that it was based firmly on logical argument, and existing theory in motivation and culture.

Conclusion

We have introduced a new, empirically supported model that incorporates the roles of culture and motivation in the vocational decision-making processes of senior high school students attending independent high schools in the Sydney metropolitan area. The model provides support for relationships between cultural orientation variables (i.e., idiocentrism, allocentrism, and long-term orientation) and constructs that form part of the vocational decision-making processes of senior high school students (i.e., occupational interest/enjoyment, social influence-family, and occupational income). Moreover, empirical evidence was found for the relationships between motivation-related variables (i.e., occupational interest/enjoyment and occupational income) and occupational attitude, a prominent mediating variable in vocational decision-making processes according to this study.

The study points to a number of areas for further investigation. An issue that may be raised is whether the final structural model would also be relevant for Grade 12 students (who may be closer to the vocational decision than Grade 11 students), and those in post-secondary education or training (who may be undertaking more specific studies or training for a narrower range of occupations). Future research could also focus on examining the role of culture and motivation using some other culture-related constructs and motivation-related theories that were not incorporated in this study. Such efforts may prove valuable in further refining the

model that was introduced, to enable a clearer and a more complete understanding of the vocational decision-making processes of senior high school students.

In practical terms, counsellors, psychologists, educators, and parents may be able to use the findings to guide adolescents on the specific processes they may go through when making the highly critical vocational/occupational decision. It appears that making an assessment of the cultural orientations of adolescents may be an important initial step to gain valuable information on the preliminary cognitive processes associated with the occupational decision. Such an assessment may provide useful insights on the particular values that are likely to be espoused by adolescents contemplating the occupational decision. Furthermore, to support the latter stages of the vocational/occupational decision-making process, interested parties could give specific focus to the two considerations that have been identified as being particularly prominent for adolescents in this study — the extent to which interest or enjoyment is valued in an occupation, and the attitudes or views of adolescents toward occupations. Possibly, less attention could be devoted to how successful adolescents expect to be in particular occupations, and to social influences from the family, which may be meaningful only for adolescents with a generally collectivist mindset with respect to their families. From the perspective of the school administrator, the findings of the study could be translated into the formulation and implementation of vocational/occupational guidance policies and procedures that clearly acknowledge the processes associated with (and the elements of) adolescent vocational/occupational decisions, and incorporate assessments of cultural orientation and focused information collection.

Authors' Note

The authors declare that they have no conflict of interest.

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Appendix A

Full Measurement Model: Means, Standard Deviations, Factor Loadings, and Error Variances

Factors/Items	M	SD	Loading	Error Variance
Allocentrism-family*				
It is important to respect my family's wishes	5.19	1.35	.64	.59
An important part of my identity is being a member of my family	5.49	1.51	.84	.29
I am motivated by what my family expects me to do	4.11	1.61	.59	.66
My family is the most important part of my life, and I do not want to be in conflict with them	5.25	1.56	.84	.29
I like to feel connected to my family	5.75	1.37	.83	.32
Long-term orientation				
What happens in the long run is more important than how one feels now	3.87	1.73	.54	.71
The most important thing in life is how one feels in the long run	4.34	1.56	.69	.52
Given the choice, it is better to get something important in the future than something you want today	5.06	1.42	.71	.50
Long range goals are more important than short range goals	4.66	1.53	.65	.57
Idiocentrism-future*				
It is important for my future happiness that I make my own decisions about my future	5.85	1.17	.56	.69
I am responsible for my own future	6.25	.99	.70	.51
Social influence-family				
My family wants me to pursue this job/occupation	5.11	1.43	.82	.33
My family approves of this job/occupation	5.77	1.36	.78	.39
My family thinks that I should pursue this job/occupation	5.33	1.36	.92	.16
Occupational income				
It will be the economic rewards that will essentially motivate me in this job/occupation	4.17	1.80	.70	.52
What matters most is how much money I will make in this job/occupation	3.61	1.81	.86	.26
Expectancy for occupational success				
I expect to be successful in gaining entry into any educational/training courses required for this job/occupation	5.76	1.15	.53	.71
I would be very good at 'learning the ropes' in this job occupation	5.79	1.20	.66	.57
I have a mental picture of myself thriving in this job/occupation	5.87	1.16	.79	.38
Recognition				
It is very important for me to impress people around me through this job/occupation	4.53	1.76	.70	.51
What matters most is how much recognition I will gain from other people from this job/occupation	3.56	1.76	.79	.37
To me, success means being noticed for my achievements in this job/occupation	4.17	1.80	.78	.38
Occupational interest/enjoyment				
I am really interested in this job/occupation	6.22	.97	.82	.32
One of the most important things about this job/occupation is that it will make me happy	6.12	1.02	.70	.51
This job/occupation will allow me to pursue my interests	6.10	1.08	.81	.34
It is very important for me to be satisfied in this job/occupation	6.17	1.01	.59	.65
Occupational intention				
I am committed to this job/occupation	5.55	1.36	.75	.43
It is likely that I will pursue this job/occupation	5.57	1.20	.76	.42
I plan to apply (or seek the required education/training) for this job/occupation	6.02	1.25	.75	.43
I intend to pursue this occupation	5.94	1.19	.83	.32
Occupational attitude				
In my personal assessment of the jobs/occupations that I could do, this one appears to be the best	5.59	1.25	.74	.46
My personal preference is to pursue this job/occupation	5.79	1.24	.77	.41
It is good for me to pursue this job/occupation	5.86	1.11	.74	.45
Personally, I have a positive opinion about this job/occupation	6.00	1.07	.77	.40

Note. *Renamed to better reflect the items loading onto the factor.

Appendix B

Goodness of Fit Indices of the Full Measurement Model

χ^2	p	df	χ^2/df	RMSEA	NFI	NNFI	CFI	GFI	AGFI
885.93	.00	482	1.84	.05	.95	.98	.98	.97	.96

Appendix C

Analysis of the Need to Combine Items Loading Onto Highly Correlated Measurement Models

APPENDIX C TABLE 1

Goodness of Fit Indices of Measurement Models of the Observed Variables Loading Onto the Factors Occupational Attitude and Occupational Intention

Model	χ^2	p	df	χ^2/df	RMSEA	NFI	NNFI	CFI	GFI	AGFI
Combined Model	36.53	.01	20	1.83	.04	.99	.99	1.00	1.00	1.00
Two Factor Model	36.58	.01	19	1.93	.05	.99	.99	1.00	1.00	1.00

APPENDIX C TABLE 2

Goodness of Fit Indices of Measurement Models of the Observed Variables Loading Onto the Factors Occupational Interest/Enjoyment and Expectancy for Occupational Success

Model	χ^2	p	df	χ^2/df	RMSEA	NFI	NNFI	CFI	GFI	AGFI
Combined Model	42.51	.00	14	3.04	.07	.98	.98	.99	.99	.99
Two Factor Model	31.23	.00	13	2.40	.06	.99	.99	.99	1.00	1.00

Note: $p < .05$ for $\Delta\chi^2$

APPENDIX C TABLE 3

Goodness of Fit Indices of Measurement Models of the Observed Variables Loading Onto the Factors Occupational Interest/Enjoyment and Occupational Attitude

Model	χ^2	p	df	χ^2/df	RMSEA	NFI	NNFI	CFI	GFI	AGFI
Combined Model	48.25	.00	20	2.41	.06	.99	.99	.99	1.00	.99
Two Factor Model	46.15	.00	19	2.43	.06	.99	.99	.99	1.00	.99

APPENDIX C TABLE 4

Goodness of Fit Indices of Measurement Models of the Observed Variables Loading Onto the Factors Occupational Interest/Enjoyment and Occupational Intention

Model	χ^2	p	df	χ^2/df	RMSEA	NFI	NNFI	CFI	GFI	AGFI
Combined Model	70.75	.00	20	3.54	.07	.98	.98	.99	.99	.99
Two Factor Model	56.19	.00	19	2.96	.07	.98	.98	.99	1.00	.99

Note: $p < .05$ for $\Delta\chi^2$

(continued over)

Appendix C (continued)

APPENDIX C TABLE 5

Goodness of Fit Indices of Measurement Models of the Observed Variables Loading Onto the Factors
Expectancy for Occupational Success and Occupational Attitude

Model	χ^2	p	df	χ^2/df	RMSEA	NFI	NNFI	CFI	GFI	AGFI
Combined Model	29.89	.01	14	2.14	.05	.99	.99	.99	1.00	.99
Two Factor Model	27.65	.01	13	2.13	.05	.99	.99	.99	1.00	.99

APPENDIX C TABLE 6

Goodness of Fit Indices of Measurement Models of the Observed Variables Loading Onto the Factors
Expectancy for Occupational Success and Occupational Intention

Model	χ^2	p	df	χ^2/df	RMSEA	NFI	NNFI	CFI	GFI	AGFI
Combined Model	43.37	.00	14	3.10	.07	.98	.98	.99	1.00	.99
Two Factor Model	38.91	.00	13	2.99	.07	.98	.98	.99	1.00	.99

Note: $p < .05$ for $\Delta\chi^2$

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