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## Development and Application of the Life Roles Inventory-Values Scale

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### ABSTRACT

One major result of the Work Importance Study (WIS), started in 1979 by an international consortium of psychologists under Donald E. Super's guidance, was the Values Scale, which tapped work and life values. The scale was later revised as part of a Canadian project and renamed the Life Roles Inventory-Values Scale (LRI-VS: Macnab, Fitzsimmons, & Casserly, 1987). The present study used a sample of 202 management and nursing undergraduates to provide a psychometric evaluation of the LRI-VS. Overall, the results from the internal-consistency reliability analyses, factor analyses at the item, value, and component levels, and gender analyses, provided qualified support for the scale. In spite of some psychometric limitations, the usefulness of the LRI-VS as a tool for self-discovery, educational, and career counselling receives qualified support. Further refinement is recommended for the scale.

### RÉSUMÉ

L'étude sur l'importance du travail [*Work Importance Study - WIS*] a débuté en 1979 à l'initiative d'un consortium international de psychologues, sous la direction de Donald E. Super. L'échelle des valeurs [*Values Scale*], qui analysait des valeurs du travail et des valeurs humaines, constitue l'un des résultats les plus importants de cette étude. L'échelle a été, plus tard, révisée en tant que section d'un projet canadien et a été rebaptisée « Inventaire des rôles de la vie- Échelle des valeurs » [*Life Roles Inventory- Values Scale*] (IRV- EV : Macnab, Fitzsimmons et Casserly, 1987). La présente étude a utilisé un échantillon de 202 étudiants suivant des cours d'enseignement infirmier ou de gestion pour obtenir une évaluation psychométrique de l'IRV- EV [*LRI- VS*]. Dans l'ensemble, les résultats des analyses de la fiabilité de la cohérence interne, des analyses factorielles au niveau des unités d'échantillonnage, des valeurs et des composantes, et des analyses par sexe ont appuyé avec réserves l'échelle. Malgré des limitations psychométriques, l'utilité de l'IRV- EV [*LRI- VS*] comme outil de découverte de soi-même et d'orientation scolaire ou professionnelle a été confirmée d'une manière restreinte. Il est recommandé une mise au point plus approfondie de l'échelle.

For the past six decades or so, educators, counsellors, and researchers have focused much attention on life and work values. Until his death in 1994, Super (1957) was a major figure in the values field with his extensive conceptual and empirical work. Essentially, Super (1973) viewed values as "objectives that one seeks to attain to satisfy a need" (p. 190) and, furthermore, that values permeate all aspects of life including vocational choice and work values (Super, 1957). His empirical work resulted in the Work Values Inventory (WVI: Super, 1970), measuring 15 values affecting the motivation to work, which became a popular instrument. Expanding upon existing work and recognizing the need to update instruments given societal changes, the Work Importance Study (WIS: Ferreira-Marques &

Miranda, 1995; Fitzsimmons, Macnab, & Casserly, 1985; Macnab, Fitzsimmons, & Casserly, 1987; Super & Sverko, 1995) started in 1979, under Super's guidance, as an international effort involving psychologists from some 17 countries around the world, including Canada, seeking to better understand work and life roles.

One major outcome of this international undertaking was the Values Scale and later the revised Life Roles Inventory-Values Scale (LRI-VS: Macnab, Fitzsimmons, & Casserly, 1985, 1987), which reflected, in part, social changes since the 1970s. The LRI-VS comprises 100 items accommodating 20 values (four items per scale) that are measured on a 4-point scale from 1 (of little or no importance) to 4 (very important). Scale scores can range from 4 to 20 where higher scores indicate greater importance for the value. Sample items from the 20 values scales are shown in Table 1. These 20 values form five factor-analytically

TABLE 1

*Sample Items From the 20 Values Scales*

| <i>Values Scales</i> | <i>Sample Items</i>                                    |
|----------------------|--|
| Ability Utilization  | use all my skills and knowledge                        |
| Achievement          | obtain results that show I have done well              |
| Advancement          | get ahead  |
| Aesthetics           | make life more beautiful                               |
| Altruism             | help people with problems                              |
| Authority            | be able to take charge at work when necessary          |
| Autonomy             | act on my own  |
| Creativity           | discover, develop, or design new things                |
| Economics            | be able to afford the things I want                    |
| Life Style           | live according to my own ideas                         |
| Personal Development | develop as a person                                    |
| Physical Activity    | exercise   |
| Prestige             | be admired for my knowledge and skills                 |
| Risk                 | do things that involve some risk                       |
| Social Interaction   | take part in activities with other people              |
| Social Relations     | spend time with people who are special to me           |
| Variety              | have each day be different in some way                 |
| Working Conditions   | have good space and light in which to work             |
| Cultural Identity    | live where people of my religion and race are accepted |
| Physical Prowess     | work hard physically                                   |

derived higher-order components (Macnab et al., 1985) as follows: Personal Achievement and Development (Ability Utilization, Achievement, Advancement, Authority, Prestige, and Personal Development); Social Orientation (Altruism, Aesthetics, Social Interaction, and Social Relations); Independence (Autonomy, Creativity, Life Style, and Variety); Economic Conditions (Economics, Working Conditions, and Cultural Identity); and Physical Activity and Risk (Physical Activity, Physical Prowess, and Risk). It should be noted that the LRI-VS is identical to the Values Scale (Nevill & Super, 1986) except that the LRI-VS has the Cultural Identity and Physical Prowess values in addition to the 18 values common to both scales. Casserly, Fitzsimmons and Macnab (1995) provide a concise description of the Canadian study of the Values Scale aspect of the WIS.

The LRI-VS has been used with various adult populations; for example, it has been used with students (Madill, Macnab, & Brintnell, 1989), occupational therapists (e.g., Madill, Vargo, & Brintnell, 1990; Taylor, Madill, & Macab, 1990), and women re-entering the workforce (Shapiro & Fitzsimmons, 1991). Following their review of the Canadian work on the Values Scale, Casserly and her colleagues (1995) concluded that the LRI-VS is a reliable and valid instrument useful in counselling situations such as midcareer change, education reentry, and preretirement counselling. Recently, Niles and Goodnough (1996) provided a detailed overview of several studies using scales from the WIS, all of which were conducted in English-speaking countries including Canadian studies. They mentioned uses such as exposing potential conflicts between home and work roles and difficulties in career development.

Central to the present study are the psychometric findings on the LRI-VS because only instruments of known and strong psychometric properties, particularly with respect to reliability and validity, should be considered for use in counselling (Flynn, 1994). Various studies report support for reliability and validity of the scale. For example, Macnab et al. (1987) noted that internal consistency reliabilities for the 20 values with different adult samples tend to fall in the range .64 to .91 with median alpha coefficients in the range .80 to .83. They also reported that factor analyses, typically principal components analyses, at the item level show support for 14 or so of the 20 a priori values and that factor analyses of the 20 scales suggest that the 20 values group into five major value components as noted previously.

The relationships between gender and these values has also been examined. For example, Taylor et al. (1990) found that scores on the LRI-VS could significantly discriminate between male and female occupational therapists in their sample. Worth Gavin (1994), among others, stressed the importance of gender effects (e.g., differing gender roles and sexual stereotyping, vocational choice, and career development) in counselling and career-development programs so any detected gender differences on the LRI-VS would be of interest to the counselling community.

The major purposes of this study were to conduct a psychometric examination of the Values Scale at the item, values scale, and values component levels to deter-

mine how well data from this sample fit the proposed values model of Macnab et al., and to examine sex differences in values. Because self-report measures such as values scale are susceptible to response bias, a standard measure of social desirability was included in the study. Results from this study should help determine the appropriateness of the scale for use in counselling.

## METHOD

### *Participants*

The study was conducted at a small, liberal education university in Western Canada. The sample consisted of 202 volunteer undergraduates (131 female and 71 male) enrolled in either management or nursing courses taught by the two investigators.

### *Measures and Procedure*

Participants completed the 100-item LRI-VS in class under emotionally-neutral, untimed conditions. Each item is a brief phrase in response to the phrase, "It is now or will be important for me to . . ." The four-point Likert-type response alternatives include (1) of little or no importance, (2) of some importance, (3) important, and (4) very important. The Scale requires about 15-20 minutes to complete. For each of the 20 values, the participant receives a score that is the total of the five items for the value; thus, the total score for each value ranges from 5 to 20. The higher the score, the more important the value is to the respondent. Participants received their scored LRI-VS and an opportunity for class discussion about the instrument, the relationships between values and educational/career choices. The importance of the 'fit' between one's values and one's career and educational choices (Swanson & Fouad, 1999) was emphasized during class discussions; for example, did a student select accounting as a major because the student is genuinely committed to accounting or because accounting is perceived to be a high-paying occupation. It would be better for these professionals-in-training to critically reflect upon their educational and career choices while there was still time to change majors than, say, 10 years later as unhappy Chartered Accountants.

Students also completed the 33-item Marlowe-Crowne Social Desirability scale (MCSD; Crowne & Marlowe, 1960) on a separate occasion. The MCSD is a long-established measure of social desirability, a form of response bias, in responding to self-report questionnaires.

## RESULTS<sup>1</sup>

### *Descriptive Statistics and Sex Differences*

The means, standard deviations, and alpha coefficients for the 20 values and five components for the total sample and separately for each gender are shown in

Table 2 along with *t*-tests for gender differences. A two-group discriminant analysis (SPSS, 1996) using scores from the 20 values was performed to identify any meaningful pattern of gender differences that is more informative than the *t*-tests. A significant discriminant function (canonical correlation = .58; Wilk's lambda = .67; chi-square (20) = 72.43,  $p < .01$ ) was obtained showing that Altruism (.57), Risk (-.36), and Working Conditions (.35) were three values with the largest standardized canonical coefficients separating men and women whose group centroids were -.94 and .53, respectively. This pattern of gender differences indicated that women valued Altruism and Working Conditions more highly than men but valued Risk less than did men. This discriminant function was able to correctly classify 80.5% of the sample according to gender (81.1% of females and 79.4% of males).

### *Reliability Analyses*

The internal-consistency reliabilities of the 20 values and five components are presented in Table 2 for the total sample and separately by gender. While the range of alpha coefficients (.58 to .88) and the median alpha coefficient (.80) for the 20 values is lower than the desired .90 level, it is recognized that each value is measured by only five items. As seen in Table 2, the Life Style scale was problematic for the total sample (.67) and, particularly, for women (.61). A closer examination of the reliability analyses revealed that item 90 (work where there are few rules and regulations) was the item with the lowest item-scale correlation (.20 and .27 respectively for the total sample and women) for the Life Style scale. As seen in Table 2, the Achievement (.58), Ability Utilization (.69), and Cultural Identity (.69) scales had particularly low reliabilities for men. There was no specific problem item in the Achievement scale but simply low inter-item and item-scale correlations with the highest value reaching only .39. Item 1 (use all my skills and knowledge) was the problem item in the Ability Utilization scale seeing as it had the lowest inter-item (.13 to .59) and item-scale (.31) correlations. Item 99 (feel proud of my cultural heritage) was the problem item in the Cultural Identity scale seeing as it had the lowest inter-item correlations (.23 to .38) and item-scale correlation (.38). However, the range of alpha coefficients (.84 to .95) for the five components is acceptable.

### *Factor Analysis of the 100 LRI-VS Items*

Principal components analyses (PCA: SPSS, 1996) with varimax (i.e., orthogonal) rotation of the extracted components were performed because Macnab et al. (1987) used this factor analytic approach in their developmental work on the LRI-VS. The PCA of scores from the 100 items and the varimax rotation of 20 components accounted for 67.37% of the pre-rotation variance and showed strong support for four of the a priori values and moderate support for the remaining values. The first 15 components, accounting for 61.06% of the variance, were meaningful and labeled while components 16 through 20 had a mix of items from different values that could not be interpreted in a meaningful way.

Table 2

*Descriptive Statistics for the Value Scales by Gender and Gender Differences*

| Value Scales         | Total Sample<br>( <i>n</i> = 202) |           |              | Women<br>( <i>n</i> = 131) |           |              | Men<br>( <i>n</i> = 71) |           |              | <i>t</i> -Tests for<br>Gender Differences |
|----------------------|-----------------------------------|-----------|--------------|----------------------------|-----------|--------------|-------------------------|-----------|--------------|---|
|                      | <i>M</i>                          | <i>SD</i> | <i>Alpha</i> | <i>M</i>                   | <i>SD</i> | <i>Alpha</i> | <i>M</i>                | <i>SD</i> | <i>Alpha</i> |   |
| Ability Utilization  | 17.46                             | 2.14      | 0.75         | 17.69                      | 2.16      | 0.77         | 17.04                   | 2.06      | 0.69         | <i>t</i> (198) = 2.05*                    |
| Achievement          | 17.60                             | 2.13      | 0.70         | 17.78                      | 2.16      | 0.76         | 17.27                   | 2.04      | 0.58         | <i>t</i> (200) = 1.64                     |
| Advancement          | 16.17                             | 3.08      | 0.83         | 15.80                      | 3.08      | 0.84         | 16.85                   | 2.97      | 0.82         | <i>t</i> (200) = -2.33*                   |
| Aesthetics           | 15.17                             | 2.86      | 0.82         | 15.35                      | 2.87      | 0.81         | 14.83                   | 2.83      | 0.84         | <i>t</i> (198) = 1.24                     |
| Altruism             | 16.44                             | 3.08      | 0.88         | 17.28                      | 2.84      | 0.89         | 14.89                   | 2.91      | 0.84         | <i>t</i> (200) = 5.68***                  |
| Authority            | 15.47                             | 2.76      | 0.80         | 15.15                      | 2.70      | 0.81         | 16.04                   | 2.78      | 0.78         | <i>t</i> (200) = -2.21*                   |
| Autonomy             | 16.24                             | 2.49      | 0.77         | 16.00                      | 2.47      | 0.77         | 16.66                   | 2.49      | 0.77         | <i>t</i> (198) = -1.77                    |
| Creativity           | 14.63                             | 2.82      | 0.79         | 14.27                      | 2.87      | 0.80         | 15.30                   | 2.61      | 0.76         | <i>t</i> (200) = -2.51*                   |
| Economics            | 17.12                             | 2.65      | 0.82         | 17.21                      | 2.62      | 0.84         | 16.96                   | 2.71      | 0.80         | <i>t</i> (200) = 0.65                     |
| Life Style           | 15.50                             | 2.37      | 0.67         | 15.10                      | 2.19      | 0.61         | 16.24                   | 2.53      | 0.73         | <i>t</i> (200) = -3.34***                 |
| Personal Development | 18.25                             | 1.95      | 0.78         | 18.53                      | 1.99      | 0.82         | 17.75                   | 1.79      | 0.67         | <i>t</i> (200) = 2.76**                   |
| Physical Activity    | 16.02                             | 2.98      | 0.81         | 15.84                      | 3.08      | 0.82         | 16.35                   | 2.77      | 0.80         | <i>t</i> (199) = -1.17                    |
| Prestige             | 16.17                             | 2.95      | 0.85         | 16.11                      | 3.12      | 0.87         | 16.28                   | 2.63      | 0.79         | <i>t</i> (199) = -0.40                    |

|                    |       |      |      |       |      |      |       |      |      |                        |
|--------------------|-------|------|------|-------|------|------|-------|------|------|------------------------|
| Risk               | 12.25 | 3.35 | 0.80 | 11.66 | 3.26 | 0.78 | 13.34 | 3.25 | 0.80 | $t(200) = -3.50^{***}$ |
| Social Interaction | 15.57 | 3.06 | 0.83 | 16.05 | 2.73 | 0.79 | 14.69 | 3.45 | 0.86 | $t(118) = 2.86^{**}$   |
| Social Relations   | 17.80 | 2.43 | 0.79 | 18.13 | 2.19 | 0.78 | 17.17 | 2.72 | 0.80 | $t(117) = 2.54^*$      |
| Variety            | 14.66 | 2.82 | 0.81 | 14.69 | 2.84 | 0.81 | 14.60 | 2.82 | 0.79 | $t(199) = 0.23$        |
| Working Conditions | 15.09 | 3.05 | 0.77 | 15.59 | 2.78 | 0.73 | 14.16 | 3.33 | 0.81 | $t(198) = 3.25^{**}$   |
| Cultural Identity  | 14.28 | 3.37 | 0.72 | 14.68 | 3.27 | 0.73 | 13.54 | 3.46 | 0.69 | $t(198) = 2.29^*$      |
| Physical Prowess   | 11.74 | 3.81 | 0.86 | 11.23 | 3.68 | 0.86 | 12.69 | 3.89 | 0.84 | $t(198) = -2.62^{**}$  |

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#### Value Components

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|                      |       |      |      |       |      |      |       |      |      |                       |
|----------------------|-------|------|------|-------|------|------|-------|------|------|-----------------------|
| Independence         | 15.24 | 1.94 | 0.87 | 15.02 | 1.89 | 0.86 | 15.66 | 1.97 | 0.87 | $t(197) = -2.26^*$    |
| Economic Conditions  | 15.51 | 2.47 | 0.87 | 15.85 | 2.34 | 0.86 | 14.89 | 2.59 | 0.86 | $t(197) = 2.67^{**}$  |
| Personal Development | 16.87 | 1.94 | 0.93 | 16.87 | 2.00 | 0.94 | 16.87 | 1.85 | 0.92 | $t(197) = -0.02$      |
| Social               | 16.26 | 2.19 | 0.91 | 16.71 | 2.01 | 0.90 | 15.41 | 2.27 | 0.91 | $t(197) = 4.15^{***}$ |
| Physical             | 13.32 | 2.69 | 0.88 | 12.88 | 2.59 | 0.87 | 14.12 | 2.70 | 0.88 | $t(197) = -3.17^{**}$ |
| Social Desirability  | 15.67 | 4.96 |      | 15.50 | 5.29 |      | 16.14 | 4.34 |      | $t(164) = -0.82$      |

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*Note:* *Alpha* = Cronbach's coefficient alpha as a measure of internal-consistency reliability. The degrees of freedom, presented in brackets following the *t* symbol, vary due to some missing data in a questionnaire or participants being absent at the administration of one of the two measures. Also, separate rather than pooled variance estimates are used where appropriate.

### *Factor Analysis of the 20 Values*

Similarly, a PCA was performed on the 20 scale scores and five orthogonal components were extracted to determine if these components resembled the five reported by Macnab et al. (1987). The five orthogonal components from the PCA of scores from the 20 values showed a meaningful solution which accounted for 68.17% of the total pre-rotation variance. Since most values loaded substantially (i.e., at least .35 or 10% of the variance) not just on one but on two components, the lesser loading was also considered in the interpretation of components. The high loadings on Component I (eigenvalue = 7.04 and 35.17% variance) were for Advancement (.79), Economics (.77), Prestige (.62), and Authority (.60) with some contribution from Achievement (.58), Autonomy (.53), and Ability Utilization (.44), which loaded higher on other components. This pattern suggested a set of values that promoted striving for personal gain and hence, the label, Personal Achievement Orientation. The high loadings on Component II (eigenvalue = 2.30 and 11.52% variance) for Altruism (.77), Personal Development (.76), Ability Utilization (.67), Achievement (.67), and Aesthetics (.60) emphasize values that reflect both the concern for higher values (i.e., Altruism and Aesthetics) and personal striving (e.g., Personal Development) and suggested the label Personal Development Orientation.

The third component (eigenvalue = 1.86 and 9.28% variance) loaded on Cultural Identity (.78), Social Relations (.70), Social Interactions (.69), and Working Conditions (.69) scales with some contribution from Altruism (.37), Aesthetics (.35), and Economics (.35), thus indicating a strong orientation towards the external social environment; therefore, Component III was labeled Community Orientation. Component 4 (eigenvalue = 1.44 and 7.21% variance) loaded highly on Life Style (.73), Creativity (.66), Autonomy (.62), and Variety (.60) with some contribution from Risk (.55) and Authority (.45). Component IV was labeled Independence Orientation seeing as this pattern reflects the Independence component reported in previous studies (e.g., Fitzsimmons et al., 1985). Finally, Component V (eigenvalue = 1.00 and 4.99% variance) loaded on Physical Prowess (.86) and Physical Activity (.74) with some contribution from Risk (.59); therefore, this component was labeled Physical Orientation.

*Confirmatory Factor Analysis of the 20 Values.* Instead of relying upon PCA, an exploratory factor analysis approach, a confirmatory factor analysis using the Analysis of Moments (AMOS) program (Arbuckle, 1997) was performed to determine how well these data fit the proposed five values components (Macnab et al., 1987). Maximum likelihood estimates were calculated from the covariance matrix (Thompson & Daniel, 1996) and several fit indexes were computed. The chi-square statistic alone is not particularly useful given that large samples will produce statistically significant chi-square values (Thompson & Daniel, 1996). The chi-square statistic divided by the degrees of freedom may be somewhat more useful. Various rules of thumb ranging from 2 to 5 have been suggested as cutoffs for CMIN/df (e.g., Byrne, 1989; Carmines & McIver, 1981; Marsh &



Hocevar, 1985). The present study used 2.00 as the cutoff such that higher values indicate an inadequate fit. The root mean square error of approximation (RMSEA) with Browne and Cudeck's (1993) suggested cutoff of about .08 to indicate a close fit was used. Bentler's (1990) comparative fit index (CFI) was also calculated where values close to 1 indicate a very good fit. The adjusted goodness of fit index (AGFI), which takes into account the degrees of freedom and is bounded by 1, a perfect fit, was also calculated. The CMIN/DF (4.34), RMSEA (1.31), CFI (0.72), and AGFI (0.63) indexes showed a poor fit between these data and the model of Macnab et al. (1987).

### *Social Desirability*

Finally, the range of correlations between scores on the values and the MCSD, -.04 to .17, indicates that the values are independent of social desirability in responding to the LRI-VS.

## DISCUSSION

Overall, these psychometric findings provide limited support for the construct validity of the LRI-VS. First, the internal consistency reliabilities for 19 of the 20 values are acceptable for the total sample recognizing that only five items are used for each value and that the reliabilities obtained in the present study are in line with those reported in the literature (e.g., Macnab et al., 1987). It should be noted that reliabilities for the Life Style scale are poor for the total sample and women and that the reliabilities for the Achievement, Ability Utilization, and Cultural Identity scales are also poor for men. Secondly, the principal components analyses provide qualified support for the construct validity of the Scale and the notion that these 20 values can form meaningful groupings or value components. The five components obtained in this study present an interesting set of value orientations; for example, a comparison of Components 1 and 2 contrast what may be viewed as the more ego involved or "Economic Man" orientation of Component 1 versus the broader super ego or "Good Citizen" orientation of Component 2. Finally, the Scale also shows some utility in differentiating between groups in a meaningful way as was found in the discriminant analysis for gender in the present study. Detecting a sex difference in values is not surprising given the long-established literature on socialization, sex roles, sexual stereotyping, and career choices. The main point is that counsellors need to be attuned to these sex differences when using the LRI-VS.

Nevertheless, there are some psychometric concerns that stem from the fact that only five items measure each value. While it is appreciated that an instrument measuring 20 values could be so long as to cause fatigue among respondents or reduce compliance in completing the scale if it contained hundreds of items, it must also be appreciated that a small number of items in a measure places a relatively low limit on the value of internal-consistency reliability coefficients and can make it more difficult to obtain clean solutions in item factor analyses.

There are several recommendations for future research that emerge from the present study. As noted in the results, several problem items (e.g., items 1, 90, and 99) were identified, thus suggesting the need for further item refinement through item and factor analyses. The additional psychometric work might be substantial, involving the generation of a new pool of items to replace poor items (e.g., items 1, 90, and 99) on several scales and then additional iterations of factor analyses and scale reliability analyses to strengthen the LRI-VS. In addition, the stability of scores over time needs to be examined using test-retest reliability analyses. Furthermore, the Scale's reliability and validity properties should be examined with more typical counselling populations such as students seeking academic program and career counselling.

To end on a positive note, these psychometric concerns should not deter practitioners such as school counsellors and career counsellors from using this instrument in a limited manner in their professional work. As Niles and Goodnough (1996) stated, the Values Scale can "make connections between values and specific steps in the career planning process" (p. 83). The LRI-VS can be a valuable tool in stimulating self-discovery and critical reflection concerning not only one's values but also how well one's values fit with one's educational and career as well as life choices. Using the present study with nursing undergraduates as an example, nursing students with low Altruism scores should critically reflect upon their educational and career choices given that the nursing profession involves a high degree of helping others especially witnessing pain and death and self-sacrifice (e.g., shift work and time away from family). Turning to the management undergraduates, these students should appreciate that the business world is very competitive and globalized thus favoring persons high in risk taking and extrinsic values such as economic gain and advancement. Management undergraduates who scored relatively low on these types of extrinsic values might not find a fit in a business or entrepreneurial setting; perhaps a not-for-profit setting or even a change in academic discipline should be considered. While the procedure used in this study was not, strictly speaking, a group counselling session on educational and career decision-making, the procedure follows a cognitive information-processing paradigm approach to career counselling (Peterson, Sampson, & Reardon, 1991; Symes, 1998) in that participants became more self-aware of the variety of important life and work values as measured by the LRI-VS, gained more self-knowledge about their values from their scored LRI-VS, were encouraged to take part in class discussions about the relationships between values and educational and career choices, and were encouraged to critically reflect upon their choices in terms of the person-environment fit (Swanson & Fouad, 1999). Nevertheless, one limitation to the present study is that it was not designed as a counselling study. Furthermore, undergraduates in professional schools such as nursing and management may be different from undergraduates in other disciplines.

### Note

<sup>1</sup> Detailed statistical tables including the factor structure tables are available from the first author.

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