Validation of the short form of the Career Development Inventory with an Iranian high school sample

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Abstract
This study utilised a sample of 310 Iranian high school students, enrolled in Years 9-11, to validate a 33-item short version of the Career Development Inventory. Factor analysis of the Inventory indicated that subscale items loaded on their respective factors, and that the attitude and cognitive subscales loaded on the appropriate factors. Internal reliability coefficients at all levels were satisfactory to good. Support for validity was demonstrated by associations in the expected direction with career decidedness and career decision-making self-efficacy. This short form of the Career Development Inventory shows promise as a measure of career maturity with students from a non-Western country.

Keywords: Career Development Inventory, career maturity, career planning, career exploration
Super’s (1957, 1990) career development theory and its central construct of career maturity have received considerable attention across many countries, including the U.S.A. (e.g., Levinson, Ohler, Caswell, & Kiewra, 1998; Savickas & Hartung, 1996; Super, Osborne, Walsh, Brown & Niles, 1992), Australia (e.g., Creed & Patton, 2003; Clayton & Fletcher, 1994; Patton & Creed, 2001), Canada (Perron, Vondracek, & Skorikov, 1998), Korea (Lee, 2001) and Thailand (Hughes & Thomas, 2006). According to Crites (1976) the central concept for understanding career behaviour is career maturity. Career maturity refers to the individual’s readiness to make informed, age-appropriate career decisions and to manage the career development tasks the individual is confronted with (Savickas, 1984). Crites (1971) proposed that career maturity consisted of cognitive and affective dimensions, with the cognitive dimension being composed of decision-making skills and the affective dimension being attitudes about the career decision-making process. The career maturity construct has great practical utility (Raskin, 1998), and has shaped career interventions for adolescents in a myriad of settings (Creed & Patton, 2003).

Several assessment instruments have been developed to measure the construct of career maturity, including the Career Maturity Inventory (Crites, 1973), the Career Development Inventory (Super, Thompson, Lindeman, Jordaan, & Myers, 1988), the Adult Career Concerns Inventory (Super et al., 1988), the Assessment of Career Decision Making (Buck & Daniels, 1985; Harren, 1979), the Career Beliefs Inventory (Krumboltz, 1994), and the Career Decision Scale (Osipow, Carney, Winer, Yanico, & Kosche, 1976).

One of the more widely used scales for measuring career maturity is the 120-item Career Development Inventory (CDI; Super et al., 1988). This scale, which was
developed in the U.S.A., incorporates two attitudinal subscales (Career Planning,
Career Exploration), two general cognitive subscales (Decision Making, World of
Work Information), and one specific cognitive subscale (Knowledge of Preferred
Occupational Group). Typically, the Career Planning and Exploration subscales are
summed to provide a composite attitudinal score (Career Development Attitude), and
Decision Making and World of Work Information are summed to provide a composite
cognitive score (Career Development Knowledge).

Lokan (1984) developed an Australian version of the Career Development
Inventory (CDI-A) based on the U.S.A. version. The CDI-A contains 75 questions
(rather than 120, as in the CDI, achieved mainly by omitting the Knowledge of
Preferred Occupational Group subscale), includes Australian-relevant questions,
employs a 4-point response format for the Career Planning subscale (rather than a 5-
point format, as in the CDI) does not weight the items in the Career Exploration
subscale, and contains fewer items in the Career Exploration (16 rather than 20) and
Decision Making subscales (12 rather than 20) than the CDI.

The CDI-A has been widely used in Australia (e.g., Clayton & Fletcher, 1994; Creed
& Patton, 2003; Patton & Creed, 2001) and in other another countries, such as South
Africa (Patton, Watson, & Creed, 2004) and Thailand (Hughes & Thomas, 2006).

The demand for a shortened version of the CDI-A has been met by Creed and
Patton (2004) with the development and validation a short form of the CDI-A. Creed
and Patton used a sample of 2,173 high school students, enrolled in Years 8-12, to
develop a 33-item shortened form (CDI-A-SF) of the Australian version of the 72-
item CDI-A. As with the original CDI-A, the CDI-A-SF comprises two attitudinal
subscales (Career Planning and Exploration) and two cognitive subscales (Decision
Making and World of Work Information). The Career Planning subscale addresses
areas such as discussing plans with an adult, choosing school subjects relevant to a future job, and knowledge of job duties and working conditions. The Career Exploration subscale addresses possible sources of advice and information about careers. The World of Work Information subscale covers content areas of information life stages, developmental tasks, job seeking and job training. The Decision Making subscale covers the domain areas of understanding the relative importance of different types of occupations, and personal and situational characteristics relevant to different jobs.

Evidence of the construct validity of the shortened version was obtained in three ways. First, factor analysis demonstrated that the factor structure of the CDI-A-SF was consistent with the original factor structure of the CDI-A. Second, associations between the CDI-A-SF and other career relevant variables (e.g., career indecision, career certainty, career decision-making self-efficacy, self-esteem) supported convergent and divergent validity. Third, appropriate age differences were identified, with older students reporting higher levels of career maturity than younger students (Creed & Patton, 2004). The authors concluded that the CDI-A-SF showed promise as a career maturity measure for adolescents and may be useful in situations where it is not possible or inappropriate to use the full scale. Similar to the CDI-A, the CDI-A-SF can be interpreted at the subscale and composite scale levels. Additional support for the reliability and validity of the CDI-A-SF was provided by Paton, Spooner-Lane, and Creed (2005) using a sample of university students.

The present study

The main purpose of this study was to validate the 33-item CDI-A-SF with an Iranian sample. To date, no measure of career development has been devised for use with adolescents in this country. The study extends the application of the CDI-A-SF
by using a sample of 310 Iranian high school students. The English-version of the CDI-A-SF was translated into Farsi, and confirmed by three bi-lingual experts in career development. Because of the difference between the Iranian and Australia educational systems, three items from the Career Planning subscale were modified. For example, high school students in Iran cannot choose subjects as the curriculum is fixed, so “Taking school subjects that will help me in the work I go into when I finish my education” was changed to “The part-time work that I engage in will help me in the work I go into when I finish my education”.

Method

Participants

Participants were 310 high school students enrolled in Grades 9-11 in four schools in Isfahan, which is Iran’s third largest city after Tehran and Mashhad, with a population of 1.5 million people. The students had a mean age of 16.41 years ($SD = 1.32$ years), and comprised 156 females (50.3%) and 154 males; 100 (32.3%) were in Grade 9, 114 (36.8%) were in Grade 10, and 95 (30.6%) were in Grade 11.

Measures

Career Maturity: Creed and Paton’s (2004) shortened form of the Australian version of the Career Development Inventory was used to measure career maturity. This short version has 33 items, and is designed for students in Years 8-12. Four subscales and two composite scales are typically calculated. The four subscales are Career Planning (10 items), Career Exploration (8 items), World of Work Information (8 items) and Career Decision Making (7 items). Scores on the Career Planning and Career Exploration scales may be combined to measure Career Development Attitude, and scores on the World of Work Information and Career Decision Making scales may be summed to measure Career Development Knowledge. Creed and Patton
(2004) assessed construct validity using factor analysis and testing the scale’s association with other career variables, and reported satisfactory internal reliability coefficients for all subscales (ranging from .70 to .87) and the two composite scales (.82 and .87).

Career Decision-Making. The Career Decision Scale (Osipow, Carney, Winer, Yanico, & Koschier, 1976) was used to measure decision-making readiness. The 19-item scale consists of two subscales: Career Indecision (16 items; e.g., “Several careers have equal appeal to me. I’m having a difficult time deciding among them”) and Career Decidedness (3 items; e.g., “I have decided on a career and feel comfortable with it. I also know how to go about implementing my choice”). Students responded to the items using a 4-point scale with endpoint descriptors of not at all like me and exactly like me. Higher scores indicated more indecision and more certainty, respectively. Karimi (2007) reported adequate validity for the scale and indicated satisfactory internal reliabilities (> .80) for an Iranian sample.

Career Decision-making Self-efficacy. The 25-item short version of the Career Decision-making Self-efficacy scale (Betz, Klein, & Taylor, 1996) was used to assess confidence regarding ability to make career-oriented decisions. Students rated their level of confidence on a 5-point Likert scale, with end-points of no confidence at all to complete confidence, to questions such as “How confident are you that you could determine what your ideal job would be?”. Higher scores indicated more career-related confidence. In Iran, Karimi (2007) reported adequate validity for the scale, and indicated satisfactory internal reliability (.92).

Procedure

Questionnaires were administered to grades 9 to 11 high school students by their classroom teachers.
Results

Means, standard deviations, and internal reliability coefficients were generated for the four subscales and two composite scales for the Iranian high school sample. These are reported in Table 1, along with comparable data reported by Creed and Paton (2004). The internal reliability coefficients for the Iranian sample ranged from .64 to .82 for the subscales, and from .74 to .82 for the composite scales, suggesting satisfactory internal reliability, and internal reliability comparable with that reported by Creed and Patton.

Insert Table 1 about here

Validity

Construct validity of the CDI-A-SF was investigated by two ways. First, the factor structure of the Career Development Inventory – Short Form was tested using factor analysis; and second, the relationship between the CDI-A-SF and other career relevant variables (career indecision, career certainty, career decision-making self-efficacy) was assessed.

To test if the factor structure of the CDI-A-SF was consistent with the original CDI structure, we examined (a) whether the individual items loaded on their respective subscales, and (b) whether the individual subscales loaded on their respective attitudinal and knowledge factors.

First, the items comprising the attitudinal domains of Career Planning and Career Exploration were subjected to a principal axis factor analysis with oblique rotation. The KMO Measure of Sampling Adequacy was .81 and Bartlett's Test of Sphericity was significant (< .001). Two factors explained 44.7% of the variance. For the most part, individual items loaded onto their respective factors, with factor loadings
ranging from .29 to .69 for Career Planning and from .35 to .69 for Career Exploration. See Table 2.

Second, the total scores for the attitudinal domains (Career Planning, Career Exploration) and the cognitive subscales (World of Work Information, Career Decision Making) were subjected to principal axis factor analysis with oblique rotation (see Table 3). The KMO Measure of Sampling Adequacy for this analysis was .68 and the Bartlet’s Test of Sphericity was significant (< .001). Two factors explained 70.46% of the variance. All subscales loaded on their appropriate factors, with factor loadings ranging from .84 to .87. See Table 3.

Third, we tested the associations between the four subscales of the CDI-A-SF (Career Planning, Career Exploration, World of Work Information, Career Decision Making), the two composite scales (Career Development Attitude, Career Development Knowledge) and the scales measuring career decision-making self-efficacy, career decision-making indecision, and career decision-making certainty. See Table 4.

The CDI-A-SF attitudinal subscales (Career Planning, Career Exploration) were significantly correlated ($r = .46$), as were the knowledge subscales (World of Work Information, Career Decision Making; $r = .44$); and the attitudinal subscales were more highly correlated with one another than they were with the knowledge subscales (range = .09 to .22). Similarly, the attitudinal subscales were more highly correlated with the composite attitude scale (range .84 to .87) than they were with the composite knowledge scale (range = .15 to .18); and the knowledge subscales were more highly correlated with the composite knowledge scale (range = .83 to .87) that they were
with the composite attitude scale (range = .15 to .18). The CDI-A-SF subscales and composite scales were uncorrelated with career decision-making indecision (range = -.09 to .02), positively, albeit weakly, correlated with career decision-making certainty (range = .06 to .27), and positively associated with career decision-making self-efficacy (range = .19 to .41), supporting the construct validity of the CDI-A-SF.

Insert Table 4 about here

**Discussion**

The present study provided support for using the 33-item short form of the CDI-A with Iranian children. Satisfactory to good internal reliability coefficients were obtained for all subscales (Career Planning, Career Exploration, World of Work Knowledge, Decision-making), and high internal reliability coefficients were recorded for the two composite scales (Career Development Attitude, Career Development Knowledge). These coefficients were comparable to those found by Creed and Paton (2004) using a similar aged sample of Australian students.

Construct validity for the test was supported using factor analysis, with individual items loading largely where they were expected, and the two attitudinal subscales (Career Planning, Career Exploration) and the two cognitive subscales (World of Work Knowledge, Decision-making) loading onto their respective factors. Inter-scale correlations were larger between the attitudinal subscales, and between the cognitive subscales, than they were across the attitudinal and cognitive subscales. The two composite scales (Career Development Attitude, Career Development Knowledge) were weakly correlated.

Validity was supported by testing correlations between the CD-A short form and the Career Decision Scale and the Career Decision-making Self-efficacy Scale. Career maturity was positively associated with career certainty and career decision-making
self-efficacy (i.e., the higher the career maturity, the more certainty about career direction and the more career-related confidence), and largely unrelated to career indecision.

Taken together, these findings provide support for the reliability, content validity and construct validity of the CDI-A short form when used with Iranian high school students. Due to the lower internal reliability coefficients for the subscales of the scale (Career Planning, Career Exploration, World of Work Knowledge, Decision-making), it is recommended that interpretation of the CDI-A should occur at the composite scale level.

The recent focus on lifelong career development and multiple career changes has highlighted the relevance of career maturity as a way of understanding the progress of individuals of all ages through the mini-cycles of career transitions (Super, 1990). The 33-item CDI-A short form appears to be a promising version of the CDI-A for Iranian high school students in career change, when interpreted at the two factor level (i.e., using the Career Development Attitude and Career Development Knowledge composite scales). Further testing in Iran is required to assess a more heterogeneous sample of Iranian children (i.e., from different cities, and from rural areas). The current study, however, has provided encouragement for the utility of this work. Given the dearth of appropriate and psychometrically sound short measures of career maturity in the career development literature generally, and the lack of any scales in the Farsi language, it is important to continue to explore the usefulness of this measure.
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Table 1
Means, Standard Deviations, and Internal Reliability Coefficients for the Career Development Inventory – Short Form

| Subscales                      | Present Study | Creed & Paton (2004) |
|--------------------------------|---------------|----------------------|
|                                | High School Students | High School Students |
|                                | (Years 9-11)     | (Years 8-12)         |
|                                | $N = 310$       | $N = 2173$           |
| $\alpha$                       | $M$  | $SD$ | $\alpha$ | $M$  | $SD$  |
| Career Planning                | .82$^a$        | 34.87 | 5.72      | .87$^a$ | 33.30 | 7.07  |
| Career Exploration             | .66$^a$        | 22.88 | 5.35      | .73$^a$ | 19.5  | 4.80  |
| World of Work Knowledge        | .66$^b$        | 4.39  | 1.83      | .73$^c$ | 5.50  | 2.15  |
| Career Decision Making         | .64$^b$        | 3.06  | 1.58      | .70$^c$ | 3.49  | 2.05  |
| Career Development Attitude    | .82$^a$        | 57.84 | 9.38      | .87$^a$ | -     | -     |
| Career Development Knowledge   | .74$^b$        | 7.45  | 2.91      | .82$^c$ | -     | -     |

$^a$Chronbach’s alpha; $^b$ Split-half internal reliability; $^c$ Kuder-Richardson 20
| Item | Factor 1 | Factor 2 |
|------|----------|----------|
|      | Career Planning | Career Exploration |
| 1    | .54       | .40       |
| 2    | .31       | .18       |
| 3    | .29       | .18       |
| 4    | .55       | .28       |
| 5    | .46       | .36       |
| 6    | .56       | .14       |
| 7    | .69       | .20       |
| 8    | .69       | .24       |
| 9    | .60       | .14       |
| 10   | .58       | .24       |
| 11   | .25       | .39       |
| 12   | .21       | .56       |
| 13   | .17       | .69       |
| 14   | .37       | .65       |
| 15   | .14       | .54       |
| 16   | .20       | .45       |
| 17   | .06       | .35       |
| 18   | .45       | .56       |

| Eigenvalue | 3.97 | 1.51 |
| % Variance | 22.10 | 8.39 |
| Factor correlation | .38 |   |
Table 3
Principal Axis Factor Analysis with Oblique Rotation of the Attitudinal and Cognitive Subscales; N = 310

| Attitudinal Subscales                  | Factor 1: Career Development Knowledge | Factor 2: Career Development Attitude |
|----------------------------------------|----------------------------------------|----------------------------------------|
| Career Planning                        | .27                                    | -.84                                   |
| Career Exploration                     | .04                                    | -.87                                   |
| Cognitive Subscales                    |                                        |                                        |
| World of Work Information              | .85                                    | -.17                                   |
| Career Decision Making                 | .85                                    | -.13                                   |
| Eigenvalue                             | 1.73                                   | 1.19                                   |
| % Variance                             | 43.26                                  | 29.84                                  |
| Factor correlation                     | .17                                    |                                        |
Table 4
Pearson’s Product-Moment Correlations between the CDI-A-SF and Career Decision-making Self-efficacy, Career Decision-making Indecision and Career Decision-making Certainty; N = 310.

|                       | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. Career Planning    | -     |       |       |       |       |       |       |       |
| 2. Career Exploration | .46** |       |       |       |       |       |       |       |
| 3. World of Work Information | .22** | .09  |       |       |       |       |       |       |
| 4. Career Decision Making | .17** | .09  | .44** |       |       |       |       |       |
| 5. Career Development Attitude | .87** | .84** | .18** | .15* |       |       |       |       |
| 6. Career Development Knowledge | .23** | .10  | .87** | .83** | .19** |       |       |       |
| 7. Career Certainty   | .16   | .27*  | .13   | .21   | .21   | .19   |       |       |
| 8. Career Indecision  | -.09  | -.09  | -.06  | .02   | -.09  | -.03  | -.35**|       |
| 9. Decision-making Self-efficacy | .41** | .19  | .29*  | .33*  | .35*  | .35** | .35** | -.26  |

*p < .05, **p < .01