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VALIDITY CONCERNS FOR COUNSELLORS USING THE 1978 EDITION OF THE CAREER MATURITY INVENTORY

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Abstract

Validity of the *Career Maturity Inventory* (CMI) was investigated using 279 grade ten and 256 grade twelve students. Factor analysis of the ten subtests of the CMI and the regression of the CMI variables on intelligence scores, sex, and grade indicated partial support of the theoretical postulations. Two principal factors emerged, but the CMI Competence and Attitude subtests did not load distinctly on the separate factors. As expected, intelligence, grade, and sex were found to be significant predictors of the CMI variables. However, evidence for discriminant validity was unsatisfactory and inconsistent with the theoretical framework of CMI. Implications for theory and practice are discussed.

Résumé

Cette étude traite de la validité du *Career Maturity Inventory* (CMI) et a été réalisée auprès d'étudiants de 10e (N=279) et de 12e année (N=256). L'analyse factorielle des dix échelles du CMI de même qu'une analyse de régression des variables du CMI en fonction des scores d'intelligence, du genre et du niveau d'étude confirme en partie les postulats sur lesquels se fonde l'instrument. La solution factorielle comporte deux facteurs principaux; cependant les échelles Compétence et Attitude chevauchent ces deux facteurs. Comme prévu, l'intelligence, le niveau d'étude et le genre contribuent à prédire de façon significative les scores aux variables du CMI. Toutefois la validité de discrimination s'avère insatisfaisante en même temps qu'inconsistante par rapport au modèle théorique du CMI. L'auteur discute des implications théoriques et pratiques de ces résultats.

Introduction

The Career Maturity Inventory (CMI) (Crites, 1978a) is a revised edition of a popular standardized instrument used by school and career counsellors to evaluate specific career process related attitudes and competencies theorized to be important in career decision making (Crites, 1961, 1965). The instrument is based on a hierarchical factor structure model of career choice content and career choice process dimensions (Crites, 1961, 1965). The content dimension refers to consistency and realism of career choice whereas the process dimension refers to career related competencies and attitudes.

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The present edition of the CMI (1978b) assesses five attitudinal variables and five competency variables. The difference between the 1973 edition and the 1978 edition is the introduction of the Counselling B1 Attitude Form. It provides for a cluster scoring system. Counsellors can extrapolate specific information on which to base follow-up counselling sessions. The number of items on the Attitude B1 Counselling Form has been expanded to seventy-five from the original fifty items on the A2 Screening Form. The subtest Compromise in Career Decision making has been substituted for Preference for Career Choice.

Rationale

In the past, investigators have raised several concerns regarding the validity of the 1973 edition of the CMI (Moore & McLean, 1977; Westbrook, Cutts, Madison & Arcia, 1980; Zytowski, 1978). The general focus of the criticisms suggests that data derived from the CMI do not necessarily provide evidence that career maturity variables can be differentiated statistically from certain non career variables such as intelligence or achievement. Westbrook *et al.* (1980) suggested that "it is possible that we are only fooling ourselves when we call some tests 'career maturity' tests and others 'achievement' or 'ability' tests". Other research has demonstrated that there may be problems with the substantiveness of some of the theoretical expectations pertaining to the Crites' model of career maturity. For instance, originally Crites (1961, 1965) predicted no expected sex differences on CMI scores. However, Alexander (1976), Omvig and Thomas (1977) and Rathburn (1973) reported that females scored significantly higher than males on CMI subscore means. Crites (1961, 1965) posited that career maturity development is monotonic. However, studies by Ansell and Hansen (1971), Breton (1972), Herr and Enderlein (1976) and Kelso (1977), demonstrate that the progression is not always strictly linear. Subsequently Crites (1978a, 1978b) revised his theoretical expectations to accomodate these data.

Investigators have explored the substantiveness of the career maturity model with correlational research designed to assess the importance of theoretically related selected predictor variables. Studies (Dillard, 1979; Lawrence & Brown, 1976; Pound, 1978; and Rehberg & Hotchkiss, 1979) examined the relationship of self-concept and self-esteem variables with career maturity variables. Contrary to theoretical expectations (Crites, 1965; Super, 1955) findings of the studies show that as a predictor variable, self-concept or self-esteem variables did not explain much of the variance associated with career maturity scores. Concerns regarding the influence of socioeconomic variables have been researched by Ansell and Hansen (1971), Maynard and Hansen (1970), and Smith (1976). Essentially data from these studies suggest that the CMI may be more appropriate for use with middle class students than with students from lower socioeconomic backgrounds. Other studies have explored the relationship of locus of control with career maturity variables (Lokan & Boss, 1977); part-time work experience and career maturity (Mahan, 1973; Yen & Healy, 1977) grade effects and career maturity (Alexander, 1976; Kelso, 1977).

A major construct validity concern related to the 1973 edition of the CMI is raised by Westbrook *et al.* (1980). Data from their study revealed a lack of congruence between the results of their factor analysis of the career maturity variables and the theoretical expectation postulated by Crites (1973). Westbrook *et al.* (1980) reported that career maturity variables of the 1973 CMI loaded only on a single factor whereas the process dimension of the Crites model constitutes two factors, Attitudes and Competencies.

Although Crites (1978a, 1978b) has addressed some of the concerns raised by past investigators, the theoretical premises of the career maturity model remain essentially the same. Furthermore, Crites (1978b) states: "increasing confidence can be place in the salience and usefulness of the CMI as a conceptually relevant and psychometrically sound inventory of two major dimensions of career maturity career choice attitudes and career choice competencies" (p.4). Since most of the published research pertains to previous editions of the CMI, it is important to investigate the applicability of the concerns to the 1978 edition of the Career Maturity Inventory.

Purpose of the Study

Specifically, the present study sought to: (1) investigate the factor structure of the ten subtests of the 1978 edition of the CMI, (2) validate the obtained factor structure

against Crites' (1978b) postulations that Competence subtests and Attitude subtests should converge on separate factors, (3) validate Crites' (1978b) theoretical postulations regarding the relationship of sex, grade, and intelligence with career maturity variables, (4) investigate the relationship of other selected theoretically related predictor variables with career maturity variables and to determine how much the variables contribute to the criterion variance, (5) on the basis of selected variables, determine the best predictor set for each of the ten criterion subscores of the Career Maturity Inventory. An overall general objective was to determine whether the 1978 CMI was a useful instrument for counsellors involved in career counselling.

Method

Sample: The sampling procedure involved listing the following strata and substrata. Nine school regions in the province of Saskatchewan Canada comprised the strata. Within each region, schools that contained Grade 10 and 12 students were identified. Based on percentage contributions to the total population, each school region was awarded a representative percentage of the total sample. Schools were selected on a random basis from a pool which represented each school region. Eleven schools and twenty-two classrooms (11 grade 10 and 11 grade 12) were randomly selected. A total of 257 boys (138 grade 10 and 119 grade 12) and 278 girls (141 grade 10 and 137 grade 12) were included in the sample.

Instruments: The following standardized instruments were administered to all grade 10 and 12 students in the sample: The Otis-Lennon Mental Ability Test (Advanced Level), The Career Maturity Inventory (1978) Attitude B-1 Counseling Form and Competence Test, The Tennessee Self Concept Scale, and the Rotter I-E Scale. In addition, a short questionnaire which included items of a socioeconomic scale and questions pertaining to estimated part-time work experience were administered. The socioeconomic scale is an adapted version of the one described and used by McLaughlin, Hunt and Montgomery (1976).

Procedure: At all schools the instruments were administered in the classroom or a large room by the principle investigator. Approximate time required to complete the instruments and the student questionnaire was four hours.

The entire test administration was completed over a five week period during the winter of 1980. The tests were administered in the following order: the Otis-Lennon Mental Ability Test, the Career Maturity Inventory (1978), Attitude B-1 Counseling Form, Questionnaire, and the Tennessee Self Concept Scale. After the lunch break the Rotter I-E Scale and the CMI Competence Test were administered.

Analyses

Stepwise Multiple Regression analyses were used to determine the regression equations. A Pearson product moment correlation matrix of the scores of the ten subtests of the CMI was submitted to an iterative principle factor analysis (Harman, 1976) followed by varimax rotation (Kaiser, 1958). The number of factors were further examined using the scree test (Cattell, 1966). A test for the significance of difference (Walker & Lev, 1953) was employed to examine the discriminant validity of the test. A program developed by Randhawa (1973) was utilized in the analysis.

Results

Regression analyses revealed that intelligence, grade, and sex were, in most cases, significant predictors of CMI variables. Parameters for inclusion of predictors to the final regression analysis were that a given predictor met or exceeded the .05 level of significance for $F(3,86)$ and that it contributed at least one percent of the explained variance for a criterion at a given step. Self-esteem, locus of control, SES, and part-time work experience were not found to be significant predictors of the CMI variables. Range of multiple R for the five regression equations of the Attitude B-1 Scale and the Total Attitude Score (Total Attitude Score was obtained by using the scoring format for the A-2 Screening Form) was from .23 to .44. The range of multiple R for the Competence Test was from .44 to .66. The contribution of predictor variables entered in the final regression analysis to the magnitude of R^2 for each prediction equation is provided in Table 1.

Intercorrelations of Career Maturity, Intelligence, Self-Esteem, and I-E Variables for the Total Sample (N = 535) [a] [b]

	Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. CMI	Decisiveness in career decision making (AT1)												
2. CMI	Involvement in career decision making (AT2)	.20											
3. CMI	Independence in career decision making (AT3)	.08	.12										
4. CMI	Orientation to career decision making (AT4)	.58	.17	.14									
5. CMI	Compromise in career decision making (AT5)	.31	.21	.18	.39								
6. CMI	Self-appraisal (P1)	.04	.33	.23	.07	.21							
7. CMI	Occupational information (P2)	.11	.35	.16	.20	.25	.53						
8. CMI	Goal selection (P3)	.03	.23	.14	.11	.19	.48	.54					
9. CMI	Planning (P4)	.08	.27	.15	.12	.22	.44	.45	.43				
10.CMI	Problem solving (P5)	.03	.27	.12	.04	.15	.46	.45	.47	.47			
11.CMI	Otis-Lennon (DIQ)	.02	.26	.21	.06	.28	.39	.43	.35	.45	.31		
12.CMI	Tennessee self-concept (TSC)	.21	.09	.10	.26	.31	.17	.16	.11	.11	.06	.13	
13.CMI	Rotter I-E (I-E)	-.13	-.15	-.13	-.13	-.07	-.12	-.17	-.11	-.12	-.08	-.06	-.17

[a] Coefficients $>.09$ are significant of the .05 level

[b] Decimals are omitted from all the correlations coefficients which were rounded to two decimal places

Table 2
Contribution of Predictor Variables to Explained Variance of Career Maturity Regression Equations for the Total Sample (N = 535)

CMI Variable	Incremental Contribution of Predictor Variables to Explained Variance R^2										Total Explained Variance R^2
AT1	TSC	.04	I-E	.01							.05
AT2	DIQ	.07	SX	.05	I-E	.02					.14
AT3	DIQ	.04	I-E	.02	SX	.01					.07
AT4	TSC	.08	WKX	.01							.09
AT5	TSC	.10	DIQ	.06	GR	.01					.17
ATT	DIQ	.09	GR	.04	TSC	.03	SX	.02	I-E	.02	.20
P1	DIQ	.15	SX	.08	GR	.06	TSC	.01			.30
P2	DIQ	.18	GR	.08	SX	.02	I-E	.02			.30
P3	DIQ	.13	GR	.04	SX	.03					.20
P4	DIQ	.20	SX	.04	GR	.03					.27
P5	DIQ	.10	SX	.09	GR	.05	I-E	.01			.24
PT	DIQ	.26	GR	.09	SX	.08	I-E	.01			.44

Note: The Codes for the CMI Variables have been designated in Table 1. The ATT variable is an unweighted sum of the five variables AT1, AT2, AT3, AT4, and AT5. Similarly, the PT Variable is an unweighted sum of the five variables P1, P2, P3, P4 and P5.

Since intelligence (DIQ) emerged as the best predictor of career maturity variables, tests for the significance of difference between CMI variables and DIQ were employed. A program developed by Randhawa (1973) which utilizes the formula recommended by Walker and Lev (1953) was used for the analyses. Results show that 13 of 20 *t* values for the Attitude Scale correlations and eight of the 20 *t* values for the Competence Test correlations did not meet the criteria for discriminant validity (required *t* at the .05 level of significance for one tailed test is 1.645 (Guilford & Fructer, 1978).

Factor analysis of the correlation matrix for the ten subtests of the CMI consisted of a principle factor solution (Harman, 1976) followed by a varimax rotation (Kaiser, 1958). Two principle factors corresponding to eigen values greater than 1.0 of the principal components solution were retained. The resultant factors accounted for 69.4% and 30.6% of the common variance and 28.5%

and 12.6%/o of the total variance respectively. All the Competence subtests and the Attitude subtest Involvement in Career Decision Making loaded on Factor I whereas Factor II was defined primarily by high loadings of three Attitude subtests. Independence in Career Decision Making did not load on either factor and demonstrated very low communality.

Table 3
Varimax Rotated Factor Loadings of the Ten CMI Variables for the Total Sample (N = 535)

Variables	Rotated Factors I	II	h^2
1. AT1	.00	.70	.50
2. AT2	.40	.23	.21
3. AT3	.22	.16	.07
4. AT4	.06	.81	.67
5. AT5	.25	.46	.28
6. P1	.71	.06	.51
7. P2	.72	.17	.55
8. P3	.68	.06	.47
9. P4	.63	.11	.41
10. P5	.67	.01	.44
%/o Total Variance	28.5	12.6	41.1
%/o Common Variance	69.4	30.6	100.0

Table 4
Varimax Rotated Factor Loadings of the Ten CMI, Intelligence, Self-Esteem, and I-E Variables for the Total Sample (N = 535)

Variables	Rotated Factors I	II	H^2
1. AT1	- .04	.69	.48
2. AT2	.39	.24	.21
3. AT3	.23	.18	.08
4. AT4	.01	.79	.63
5. AT5	.24	.50	.31
6. P1	.70	.10	.51
7. P2	.71	.21	.55
8. P3	.67	.09	.45
9. P4	.65	.13	.44
10. P5	.64	.03	.42
11. DIQ	.57	.11	.34
12. TSC	.13	.36	.15
13. I-E	-.15	-.19	.06
%/o Total Variance	32.86	13.4	46.26
%/o Common Variance	71.0	29.0	100.0

Discussion

The findings that a measure of intelligence (DIQ) was a significant contributor to a majority of the regression equations is consistent with data reported by Westbrook *et al.* (1980). The finding supports Crites' (1978a, 1978b) theoretical assumption that there should be a high correlation between intelligence and career maturity competence variables. However, it raises questions regarding the discriminant validity of the CMI. Similar to studies by Hanna and Neely (1978) and Westbrook *et al* (1980), data from this study show that it is difficult to distinguish between intelligence variables and career maturity Competence Test variables. Are they similar?

The fact that DIQ emerged as a significant predictor for three of five Attitude subtests (Involvement in Career Decision Making, Independence in Career Decision Making and Compromise in Career Decision Making) and for the Total Attitude Score (derived form the A-2 Screening Format) causes and additional concern. Since Crites (1978a) refers to the Attitude subtests as "non-intellective scales" (p. 22), the significant relationship between DIQ and the Attitude variables is surprising. Also interesting is that the Attitude sub-test Involvement in Career Decision Making loaded significantly on the same factor as the Competence subtests and the intelligence variable.

Results pertaining to the relationship of the variables self-esteem, locus of control, and part-time work experience are consistent with data reported in previous studies. The finding of a weak but significant relationship with self-esteem and career maturity variables is supported by Lawrence and Brown (1976), Jones, Hansen, and Putnam (1976), and Rehberg and Hotchkiss (1979). Despite the fact that self-esteem was the major predictor for two Attitude subtests, the R^2 values did not exceed .09. The relationship between locus of control and CMI variables was generally significant at the .05 level; however, its contribution to the magnitude of R^2 was negligible. These findings are similar to those reported by Ifenwanta (1978) and Lokan and Boss (1977).

Although the relationship of part-time work experience with career maturity variables was weak but significant at the .05 level for several of the subtests, it emerged as a significant predictor only for the Attitude subtest Orientation to Career Decision Making. Since the explained variance barely met the inclusion requirement it is difficult to extrapolate the meaning of the statistical relationship other than to recognize that the relationship is a logical one. As in the case of self-esteem and locus of control, the effect on the explained overall variance was negligible. This finding is supported by Mahan (1973).

Socioeconomic status did not emerge as a significant predictor of career maturity. This result supports finding by Lawrence and Brown (1976) and is contrary to data presented by Smith (1976). Crites (1978a) postulated that

socioeconomic circumstances may account for depressed performance on the Career Maturity Inventory. The results of the present study are contrary to Crites' (1978a) postulation.

Sex and grade variables emerged as significant predictors of career maturity. The finding that females tended to score higher than males is consistent with Crites (1978a) revised expectation regarding the relationship between sex and career maturity variables. It should be noted that this finding is more applicable to the Competence section of the CMI. These results support studies by Herr and Enderlein (1976), Neely (1980), Omvig and Thomas (1977), and Rathburn (1973). In the case of the Attitude Scale, females scored higher on two of the subtests (Involvement in Career Decision Making and Independence in Career Decision Making) and the Total Attitude Score (A-2 Screening Form).

Grade emerged as a significant predictor for all of the Competence subtests. However, in the case of the Attitude Scale (Counseling B-1 Form) grade significantly contributed only to the Compromise in Career Decision Making subtest. Thus, support for the theory of monotonic increases in career maturity was obtained for the Competence Test but not for the Attitude Scale (Counseling B-1 Form).

The construct validity of the CMI, with respect to the two factor structure proposed by Crites' model (1978a, 1978b) was supported by the findings of the present study. This finding is contrary to the results of the Westbrook *et al* (1980) investigation which reported one factor. However, although two factors emerged from the analysis, the data showed that Attitude subscale Involvement in Career Decision Making loaded significantly on the same factor as the Competence tests and that Independence in Career Decision Making did not have sufficiently high loading on either factor. In fact, this subscale had a very low communality. Since the findings of the present study did not support Crites' (1978a, 1978b) assumption that the Attitude clusters converge on an overall factor of attitudinal maturity it can be argued that there may be construct validity problems with the Counseling B-1 Form.

Conclusions

The findings of the present study suggest that there may be validity problems with the 1978 edition of the Career Maturity Inventory. The discriminant and construct validity concerns raised in this investigation should be replicated with a similar sample in order to cross validate the results. It should be noted that some of the subtests of the CMI, notably the Competence subtests Goal Selection and Problem Solving and the Attitude subtests Decisiveness and Orientation achieved satisfactory discriminant validity as defined by this study. It would seem that some subtests are better indicators of career maturity than others. Counsellors should be cognizant of these validity concerns when making interpretations of individual score profiles. The construct validity concerns regarding the Attitude B-1 Counseling Form need to be addressed further. A study should be conducted which investigates why the Attitude subtests Involvement and Independence do not converge on the same factor as Attitude subtests Decisiveness, Orientation, and Compromise. Content analysis may be fruitful in this regard. As it stands, the data from this research suggests that counsellors should not rely heavily on the cluster score approach to interpreting the Attitude B-1 form until additional studies further clarify the issue.

Since theoretically linked variables such as self-esteem and part-time work experience do not appear, at least statistically, to be good predictors of career maturity variables, more research is required to address the question of what variables are good predictors. This study suggests that if you are intelligent, female, and in an advanced grade you will likely obtain high scores on the CMI. An additional concern raised by many counsellors and students is the excessive reading time required to complete the two tests. Research is required to evaluate the effect of the reading component on test results.

Research is needed to investigate the effects of ethnic and cultural differences on career maturity variables as defined by the CMI.

At a time when school counsellors are searching for aids that will assist them in the career guidance process, it is important to understand that while the CMI does provide a framework from which to structure career counselling activities, the validity concerns raised in this paper and other research provide a rationale for counsellors to approach the interpretation of obtained scores on the CMI with caution.

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