

## Revision of the Career Maturity Inventory

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Since the last edition of the Career Maturity Inventory (CMI; Crites, 1978a) was published, it has become increasingly apparent that a revision is needed. Five considerations directed the preparation and construction of the 1995 CMI: (a) to reduce administration and testing time, (b) to extend the CMI to the postsecondary adult levels, (c) to eliminate subscales, (d) to construct a collateral Career Developer (CDR) for the interpretation of the CMI, and (e) to offer both hand- and machine-scoring options for individuals and aggregate data analysis. The 1995 CMI was derived from the 1978 edition, but it is also based on previously unpublished longitudinal data for item selection, which augment the original cross-sectional data. In addition, new Competence Test items were written, with *Agree* and *Disagree* response options, to replace the former 5-response-place items. The 1995 CMI now consists of 25 Attitude scale items and 25 Competence Test items, each yielding a score that measures degree of career maturity of conative and cognitive variables, respectively. In addition, there is an overall career maturity score that is a composite of attitudes and competencies.

The CMI was formerly known as the Vocational Development Inventory (VDI); it was first administered in 1961 to Grades 5 through 12 in the Cedar Rapids, IA school system. Conceptually, it had roots in Super's Career Pattern Study (Super et al., 1957). The VDI consisted of 50 attitudinal statements about making a career choice. The first of its kind, the VDI measured the process of career choice, not the content of career choice (Crites, 1978b). The VDI was extensively studied in over 500 research projects over the period from 1961 to 1972 (Crites). The accumulated data documented its reliability and validity, as well as its usefulness in career counseling. It was correlated with a number of socioeconomic, cognitive, and personality variables. It fit into an extensive "nomonological network" that supported its psychometric characteristics as a measure of career maturity (then termed *vocational maturity*). The VDI had a major shortcoming,

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however—it was one-dimensional. It measured only career choice attitudes and did not assess career choice competencies, such as self-appraisal and occupational information, the more cognitive variables in career maturity.

To correct this deficiency, the Competence Test was added to the CMI and published in 1973. It consisted of five subtests: Self-Appraisal, Occupational Information, Goal Selection, Planning, and Problem-Solving. Another 500 studies were conducted on this augmented CMI, and they supported its internal consistency, test-retest reliability, construct validity, and criterion-related validity. There was also research evidence to document the usefulness of the CMI for program evaluation. The CMI was used as a pretest and posttest criterion measure in many studies of the impact of career guidance interventions on both career choice attitudes and career choice competencies. One of the most significant findings emanating from this research was that the career-mature responses to the CMI can be *taught*. Explanations of the career-mature responses to both the Attitude scale and the Competence Test were written and used as an intervention. First, the CMI was administered on pretest under standard conditions, and item responses were recorded. Second, respondents read the explanations of why a particular item response was mature (“teaching the test”). Finally, the CMI was re-administered on posttest, and gains were calculated. Analyses indicated highly significant increases in scores on the second testing. But, even more significantly, independent of teaching the test, realism of career choice also increased, indicating that the intervention had an effect on this outcome criterion in the process of career choice. These findings subsequently led to the construction of the CDR.

To further develop and expand the CMI, its author revised it in 1978. The major changes were twofold:

1. Twenty-five new items were added to the original 50 items of the Attitude scale for a total of 75 items in Counseling Form B-1. These additional items made possible the construction of five subscales for the Attitude scale: Orientation to Career Choice, Involvement in Career Choice, Independence in Career Choice, Compromise in Career Choice, and Decisiveness in Career Choice.
2. The Model of Career Maturity (Crites, 1978), based on a research foundation of over 1,000 studies and factor analyses of the newly accumulated normative data for this second edition of the CMI, was constructed.

The foundation for this version is outlined and presented in Crites’ *Theory and Research Handbook* (1978b). This has been the basic reference for the CMI in the past and remains so for the current revision.

### **Specifications for Revising the CMI**

Since the 1978 revision of the CMI, users of the inventory have identified five drawbacks in the 1978 CMI: (a) excessively long administration time, (b) restricted applicability to postsecondary students and employed adults, (c) limited usefulness of the subscales in differential diagnosis of career



choice problems, (d) circumscribed use of item responses in counseling interventions, and (e) incompleteness in scoring options.

These five considerations guided the 1995 revision of the CMI and resulted in the following six specifications for the 1995 revision:

1. *To reduce administration and testing time.* The 1978 edition of the CMI took approximately 2½ hours to administer—30 minutes for the Attitude scale and 2 hours for the Competence Test. This edition of the CMI was constructed to adhere as closely as possible to the American Psychological Association's (1985) *Standards for Educational and Psychological Testing*. To meet these standards and to measure all dimensions of the Model of Career Maturity, every effort was made to be as comprehensive as possible, and this goal was largely achieved. The consequence was that testing time was increased and that the Attitude scale was used more than the Competence Test, the result being that the cognitive dimension of career maturity was largely not measured. However, the 1978 CMI provided an extensive pool of items from which the current revision could draw, not only to reduce testing time, but also to include both the attitudinal and cognitive aspects of the Model of Career Maturity. Both of these objectives have been achieved in the 1995 CMI.
2. *To extend the CMI to the adult level, including postsecondary students and gainfully employed individuals.* The 1978 CMI, particularly the Competence Test, which included items with content specific to Grades 5 through 12, was originally developed to be applicable to high school students. It was standardized and validated on these grades, but it was thought that the inventory might be extended to postsecondary populations because, it was hypothesized, there would be sufficient individual differences to measure career maturity at those age levels. Consequently, in 1978, the CMI for Adults was prepared and published. Normative data were subsequently gathered, but it became apparent that there was a ceiling effect on most of the CMI scales (i.e., the score distributions were skewed positively to the upper ranges of the scales, thus reducing the range of individual differences). It was concluded that the original CMI was not applicable to older individuals; therefore, the CMI for Adults was withdrawn. What was needed was a CMI with appropriate item content for postsecondary individuals. The items in the 1995 CMI have been selected to meet this criterion, as well as to be applicable to high school students.
3. *To eliminate Attitude scale and Competence Test subscales.* To measure all the variables in the Model of Career Maturity and to provide diagnostic information from profile analysis, subscales were constructed for both parts of the 1978 CMI:

- Attitude scale: Orientation to Career Decision Making, Involvement in Career Decision Making, Independence in Career Decision Making, Compromise in Career Decision Making, and Decisiveness in Career Decision Making.
- Competence Test: Self-Appraisal, Occupational Information, Goal Selection, Planning, and Problem Solving.

Several considerations were made in eliminating these subscales: (a) decrease testing time, (b) eliminate lower than desirable reliabilities, and (c) recognize their minimal use in counseling practice. The 1995 CMI yields only three scores: Attitude scale, Competence Test, and overall Career Maturity. In place of the subscales, the CDR was constructed to interpret each item in this revision. This addition not only teaches the test, but it allows the individual to hand score the CMI and to retain the CDR for future reference and review.

4. *To construct the CDR as a supplement to the 1995 CMI.* Research on the CDR began in the mid-1970s and has continued to the present (Savickas, 1990). From this research, it was determined that the CMI could be taught. By reading explanations of why a response was mature or not, scores increased significantly from pretest to posttest. This phenomenon would be trivial, at best, had it not been independently found that realism of career choice also increased. In other words, by being taught the test (CMI with the CDR), subjects made career choices that were more congruent with their interests and aptitudes. This finding suggested that the CDR had efficacy as a career counseling adjunct to the CMI. Furthermore, the CDR can be hand scored within a matter of minutes and retained by the person who took the CMI for future use, possibly for discussion in career counseling or with parents or colleagues. The CDR, in an earlier form, has been extensively used in field trials and has been refined to its current edition.
5. *To prepare 1995 CMI and CDR forms for a variety of scoring and aggregate data analysis purposes.* The 1978 CMI had two types of scoring: hand scoring and machine scoring. For hand scoring, there was a separate answer sheet and a scoring stencil. Each score was calculated separately, but these were raw scores and were not graphed on a profile sheet. The user had to match raw scores with the percentile ranks and standard scores in the norm tables. There was a scannable answer sheet for machine scoring, from which a Career Maturity Profile could be generated, but this form could not be hand scored. It seemed highly desirable, therefore, that all scoring options be offered in the 1995 CMI: hand scoring,



machine scoring, and a combination of hand and machine scoring. Hand scoring can be easily accomplished with the CDR. Machine scoring utilizes the CMI booklet with a separate scannable answer sheet that can be processed for aggregate data analysis and research. The unique feature of the 1995 CMI revision is that a combined CMI/CDR form can be both hand and machine scored, and the CMI, with a scannable answer sheet, is machine scorable.

6. *To select items that represent the former subscales.* Although (following one of the prior specifications) the subscales from the 1978 CMI were dropped from the 1995 revision, it was desirable to select items that represented the former subscales. Consequently, the following construction design was formulated to include two stipulations that systematically meet this additional specification. The first stipulation was to constitute the Attitude scale and Competence Test with 25 items each. The rationale was that 25 items in each part would be sufficient to achieve high reliability for total scores. Too few items yield lower reliability, and too many items, beyond an asymptote, do not increase reliability. Twenty-five items is about optimal for both reliability, and validity. The second stipulation was to identify five items for each of the subscales from the 1978 CMI. Criteria for the selection of items were (a) maximum item variances, ideally 50/50 splits between the binary options of *Agree* (A) and *Disagree* (D), and (b) as high item-to-scale correlations from the 1978 CMI as possible. In addition, for the Attitude scale, new longitudinal item data were used to select items.

## **The 1995 Revision of the CMI**

These six specifications guided the reconstruction of the Attitude scale and the Competence Test, which constitute the 1995 revision of the CMI.

### **The Attitude Scale**

#### ***Content***

A full description of the item content in the Attitude scale of the 1978 CMI, from which the items in the 1995 CMI were drawn, is given in the second edition of the *Theory and Research Handbook* (Crites, 1978b). The “dispositional response tendencies” measured by the Attitude scale encompass the behaviors and attitudes mentioned previously. For the revision, five items were selected to represent each of these variables from the 1978 CMI subscales. The items are listed in the same order as they were in the 1978 CMI, which was a random order. The only difference between the 1978 CMI and 1995 CMI response formats is a change from *True* (T) and *False* (F) to *Agree* (A) and *Disagree* (D).

**Applicability**

In the 1978 CMI Attitude scale, there were several items that were specific to the school years, such as:

"I plan to follow the line of work my parents suggest."

"I don't know what courses I should take in school."

"By the time you are 15, you should have your mind pretty well made up about the occupation you intend to enter."

To generalize the 1995 CMI to postsecondary populations, items like these were eliminated from the revision. All items in the 1995 CMI are applicable to both younger and older individuals. They are also equally applicable to male and female participants, as well as to members of minority groups. The reading level of the Attitude scale items is between the fifth and sixth grades (Dale-Chall Index of Readability). The only limitations of applicability are to disabled or handicapped individuals, such as the mentally retarded or visually or hearing impaired.

**Item selection**

In the original standardization of the Attitude scale, only items that statistically differentiated among Grades 5 through 12 were selected. There are 50 of these in the 1973 CMI. In the 1978 CMI, 25 new items were added, using the same criterion. Each item exhibited a "developmental gradient," either increasing or decreasing monotonic functions. However, these data were cross-sectional. Therefore, in subsequent data collection on the core samples in the standardization, longitudinal data were gathered to compare with the cross-sectional analyses. These are previously unpublished results that were used in the 1995 CMI Attitude scale. The trends between the cross-sectional and longitudinal data analyses were compared statistically to identify items with *no* significant differences at the .01 level. All items in the 1995 CMI meet this criterion. In other words, they are both cross-sectionally *and* longitudinally valid. In addition, most of the items highly differentiated between the lower and higher grades. In general, items that cross over the 50% point across grades are highly differentiating items.

**Reliability and validity**

Because the items in the 1995 CMI were selected from the 1978 CMI, they have the same reliability and validity as the items in the previous edition, but ongoing research is being conducted on the revision and will be reported periodically as results become available.

**The Competence Test****Content**

The Competence Test in the 1978 CMI consisted of five parts, as noted earlier. Each part was composed of 20 multiple-choice items with five



options. The content of the items was specific to Grades 5 through 12, and each part yielded a score. As mentioned previously, although the Competence Test had acceptable psychometric characteristics (reliability and validity), it had some shortcomings. First, the testing time was too long—approximately 2 hours. And, second, it was not applicable to postsecondary individuals. Furthermore, the subscales did not have widespread use. To eliminate these drawbacks, several changes were made in the 1995 CMI:

- New items were written that would be applicable to both school and nonschool populations.
- The response format was changed from multiple choice to *Agree* (A) and *Disagree* (D).
- Subscales were eliminated, but are represented by 5 items each, for a total of 25 items in the 1995 CMI Competence Test. A composite score is calculated from these items.

As a result of these revisions, the Competence Test content is more generally applicable, testing time has been greatly reduced, and item interpretations with the CDR have replaced the subscales.

The content validity of the Competence Test derives from two sources. The 1995 CMI items were written in parallel to the 1978 items. They cover the same competency areas and are distributed equally across the former subscales. Items are also balanced for gender and for majority and minority group membership. The construct validity of the new items is consistent with the Model of Career Maturity. Each item “fits” the Model and measures the cognitive dimensions of the Model. The construct validity of the 1978 Competence Test is well established; however, empirical evidence is needed on the new items. Similarly, criterion-related validity must be investigated. Studies of construct- and criterion-related validity, as well as reports of internal consistency and test-retest reliability, will be forthcoming from studies currently in progress.

## Summary

The purpose of revising the CMI Attitude scale and Competence Test was more practical than theoretical. Over 2,000 studies of the 1978 CMI document the salience and usefulness of the Model of Career Maturity. It fits the data, but its career counseling usefulness has been more limited. The 1995 CMI was designed to make it more relevant and usable in counseling, career development programs, and the overall process of career choice. The addition of the CDR to the CMI combines intervention with measurement.

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