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ABSTRACT

Making a career choice can be one of the most important decisions in a person's life. Instruments recently developed for use in career counseling have placed an increased emphasis on evaluating career-related beliefs. The purpose of the present study was to evaluate the psychometric characteristics of "Career Beliefs Inventory" scores in terms of construct validity. Factor analysis was the primary vehicle for this exploration. Two independent samples of data (251 undergraduates and 1,788 adults from the national standardization sample) were analyzed using confirmatory factor first-order and exploratory second-order factor analysis. Although the instrument has promise as a measure for use in career counseling or research regarding career choice, these analyses did not support a conclusion that its scores were valid. Confirmatory tests of theoretical models did not fit well, and results of the exploratory second-order analyses did not reproduce the previously reported exploratory factor analytic results. Nevertheless, replicable constructs were isolated across the two samples. (Contains 4 tables and 34 references.) (Author/SLD)

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The Construct Validity of Scores on the Career Beliefs Inventory

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ABSTRACT

Making a career choice can be one of the most important decisions in a person's life. Instruments recently developed for use in career counseling have placed an increased emphasis on evaluating career-related *beliefs*. The purpose of the present study was to evaluate the psychometric characteristics of Career Beliefs Inventory scores in terms of construct validity. Factor analysis was the primary vehicle for this exploration. Two independent samples of data (n_1=251; n_2=1,788) were analyzed using confirmatory first-order and exploratory second-order factor analysis.

The Construct Validity of Scores on the Career Beliefs Inventory

Making a career choice can be one of the most important decisions in a person's life. Despite the importance associated with making a career choice, however, many high school and college students are generally uninformed about the career development process (Dorn & Welch, 1985).

Family, culture, and environment all shape career aspirations, beliefs, values, and attitudes about the self (Cheatham, 1990; Savickas, 1991). However, exposure to vocational information from family and society can result in misinformation or irrational beliefs regarding careers and self-efficacy in relation to careers. Misinformation--i.e., "career myths" or irrational beliefs--contributes to ineffective career development or faulty strategies regarding job acquisition (Dorn, 1990). "Career beliefs" are assumptions and generalizations about ourselves, the work world, and our ability to succeed in the work world (Krumboltz, 1991).

The role of school and career counselors formally aiding people with career exploration and development dates back to Frank Parsons, the "father of vocational counseling." Since Parsons first introduced his trait factor model of vocational counseling in 1909 (Yost & Corbishly, 1987), various theories of career development have been conceptualized, each with a particular emphasis. For example, Ginzberg and colleagues (1951) emphasized a developmental approach to vocational choice, Super (1957)

introduced a model of career development that highlighted self-concept and values, Roe's theory (1956) associated occupational choice with personality, Holland (1966) developed a typology of personalities and work environments, and Krumboltz's (1976) theory of career counseling corresponded with social learning theory and acknowledged the importance of beliefs regarding career choices.

Just as there are several models and theories of career development, several measures of career development and vocational choice, corresponding with theories, exist. "Traditional" career measures, such as the Strong Interest Inventory (SII), first introduced in 1927, and the Self-Directed Search (SDS), first published in 1971, target clients' *interests* and tend to follow a trait-factor model of career counseling.

However, career choice involves more than a person's abilities and interests, and is also influenced by values and *beliefs*. Thus, more recently introduced measures, such as The Values Scale (Nevill & Super, 1989), focus on the beliefs that clients hold in relation to career choice. One particular instrument, the Career Beliefs Inventory (CBI; Krumboltz, 1991, 1994), was developed to aid career counselors in identifying client's beliefs as these beliefs relate to career development and vocational choice.

However, very limited research associated with the CBI is available, because the CBI was only recently published. Because the measure is new and because the measure focuses on career beliefs--a psychological construct most previous measures have not considered, it is important to investigate the CBI's potential

contribution to career counseling.

However, a possible concern with the utility of the CBI involves the CBI's format. The CBI is a 96-item inventory that yields scores on 25 scales. Consider this format in contrast with the MMPI-II (Butcher, Dahlstrom, Graham, Tellegen, & Kaemer, 1989), another psychological assessment tool, that has 567 items and yields 10 clinical scales. The relatively large number of scales generated by the CBI, in contrast to a more manageable number such as 10, tends to make the CBI clinically cumbersome. Additionally, items per scale on the CBI range from a minimum of two to a maximum of eight, which may yield limited scale score reliability (Thompson, 1994). On the other hand, if the CBI does yield reliable scores on 25 scales using relatively few items, this would certainly make the measure an efficient and information-rich protocol.

An additional concern with the CBI involves the construct validity of the measure's scores. The 25 scales are grouped into five "logical headings", suggesting that the scales found under each heading are linked in some way. Results from limited previous factor analytic work (Krumboltz, 1991, pp. 21-24), however, suggest that the CBI has a four factor structure that diverges from the "logical" headings into which the CBI scales are grouped.

The overall purpose of the present study was to evaluate the psychometric characteristics of CBI scores in terms of construct validity. Factor analysis was the primary vehicle for this exploration.

Many researchers have acknowledged the prominent role that factor analysis can play in efforts to establish construct validity. For example, Nunnally (1978, p. 111) noted that, historically, "construct validity has been spoken of as [both] 'trait validity' and 'factorial validity.'"

Similarly, Gorsuch (1983, p. 350) noted that, "A prime use of factor analysis has been in the development of both the operational constructs for an area and the operational representatives for the theoretical constructs." In short, "factor analysis is intimately involved with questions of validity.... Factor analysis is at the heart of the measurement of psychological constructs" (Nunnally, 1978, pp. 112-113).

Methods

Subjects

Two independent samples of data were employed in the present study. This was done to explore the replicability of results across samples. Too few researchers empirically investigate the replicability of their results, perhaps because some researchers still incorrectly believe that statistical significance tests evaluate result replicability (Cohen, 1994; Thompson, 1993, 1994).

The first sample consisted of 251 undergraduate students enrolled in study skills classes open to all majors in a large Research I university. There were somewhat more females (73.7%) than males in this sample. The sample primarily consisted of non-minority students (70.5%); hispanics (15.5%) constituted the largest minority component within the sample.

The second sample (n = 1,788) was the national standardization sample, described in the CBI manual (Krumboltz, 1991). This sample also included more females (61.2%) than males. The CBI author, Professor Krumboltz, was kind enough to share the standardization data with us for the purposes of the present study.

Although taking the CBI is generally "non-threatening," some people may not respond to the test items in a careful, serious manner. For example, some subjects may answer test items randomly, may have a reading level not compatible with the eighth-grade reading level of the CBI, or might carelessly mismark the answer sheet.

An additional CBI score, called the Administration Index (AI), provides a method to assure that a person is responding to the CBI in a reliable way (Krumboltz, 1991). The AI scale consists of 25 item pairs. Based on research, two item that have a "high interrelationship" (p. 8) were paired together. Consequently, the response to one item should be related to response on the second item in each pair.

The manual recommends using an AI consistency cutoff score of 42 as an indication of valid completion of the CBI by a given subject. Our final two samples (n_1=251 and n_2=1,788) both included only subjects whose AI scores were at least 42.

Instrumentation

The CBI is a 96-item pencil-and-paper test written at the eighth-grade reading level. Test items are presented in a 5-point Likert response format, ranging from (1) "strongly disagree" to (5)

"strongly agree." Some items are reverse scored to guard against response sets.

The 96 test items are grouped into 25 scales: (a) Employment Status, (b) Career Plans, (c) Acceptance of Uncertainty, (d) Openness, (e) Achievement, (f) College Education, (g) Intrinsic Satisfaction, (h) Peer Equality, (i) Structured Work Environment, (j) Control, (k) Responsibility, (l) Approval of Others, (m) Self-other Comparisons, (n) Occupation/College Variation, (o) Career Path Flexibility, (p) Post-training Transition, (q) Job Experimentation, (r) Relocation, (s) Improving Self, (t) Persisting While Uncertain, (u) Taking Risks, (v) Learning Job Skills, (w) Negotiating/Searching, (x) Overcoming Obstacles, and (y) Working Hard.

The 25 scales are then organized in the CBI manual under five logical headings: "My Current Career Situation" includes scales "A" through "D", "What Seems Necessary for my Happiness" includes scales "E" through "I", "Factors that Influence my Decisions" include scales "J" through "O", "Change I am Willing to Make" includes scales "P" through "R", and "Effort I am Willing to Initiate" includes scales "S" through "Y".

Results

Confirmatory Factor Analyses

Confirmatory factor analyses were conducted using the LISREL 7.16 program described by Jöreskog and Sörbom/SPSS (1989). Confirmatory factor analysis is an important research tool, because confirmatory methods take theoretical expectations into account as

part of factor extraction.

Myriad fit statistics can be consulted to help researchers evaluate the fit of construct definitions to data (Bentler, 1990, 1994). These statistics include the LISREL goodness-of-fit index (GFI), the parsimonious GFI (PGFI) (Mulaik, James, Van Alstine, Bennett, Lind & Stilwell, 1989), the Bentler (1990) comparative fit index (CFI), and the parsimonious CFI (PCFI), among others. Goodness-of-fit statistics ascending upward towards one are desired, while noncentrality ratios (noncentrality statistic / degrees of freedom) descending downward toward two or less are usually considered as indicating good model fit to data.

In addition to a null or "baseline" model presuming no factors, we fit four substantive models to our data. The first two models both presumed that 5 factors were created by the 25 scales, based on the 5 logical headings described in the CBI manual ("My Current Career Situation", "What Seems Necessary for my Happiness", etc.). The first model presumed that the 5 factors were uncorrelated, while the second model freed the factor correlation parameters.

Based on the exploratory factor analytic results reported in the CBI manual (Krumboltz, 1991, pp. 21-24), we also tested a fit of models involving 4 factors to the data. Again, we tested both a model presuming uncorrelated factors and a model allowing the factors to be correlated. In our model tests we analyzed the variance-covariance matrices using maximum-likelihood estimation procedures.

None of the models had reasonable fit to our data. For example, GFI and CFI indices ranged from .44 to .82. The fit statistics weighted by the parsimony ratios ranged from .40 to .68. The results of the confirmatory structural analyses suggested that it was necessary to reconceptualize the models implied in the CBI manual (Krumboltz, 1991). One vehicle for deriving such models was the return to exploratory factor analyses as the analytic method of choice.

Exploratory Factor Analyses

Second-order exploratory factor analysis was then employed to evaluate the two data sets. With respect to *second-order* factor analysis, Kerlinger (1984) noted that, "while ordinary factor analysis is probably well understood, second-order factor analysis, a vitally important part of the analysis, seems not to be widely known and understood" (p. xivv). Example applications of second-order factor analysis have been reported by Kerlinger (1984), Thompson and Borrello (1986), Thompson and Miller (1981), and by Wasserman, Matula and Thompson (1993).

Gorsuch (1983) emphasizes that the extraction of correlated factors implies that second-order factors should be extracted. He noted, "Rotating obliquely in factor analysis implies that the factors do overlap and that there are, therefore, broader areas of generality than just a primary factor. Implicit in all oblique rotations are higher-order factors. It is recommended that these be extracted and examined..." (p. 255).

Thompson (1990, p. 575) explained second-order analysis

thusly:

> Many researchers are familiar with the extraction of principal components from either a variance-covariance matrix or a correlation matrix. However, the factors extracted from such matrices can be rotated obliquely such that the rotated factors themselves are correlated. This interfactor matrix can then, in turn, also be subjected to factor analysis. These 'higher order' factors would be termed second-order factors.

However, as McClain (1995) emphasized, it is important not to try to interpret these second-order factors without first directly relating them back to the observed variables themselves. Interpreting second-order factors only with reference to the first-order factors has been likened to interpreting shadows (second-order factors) made by other shadows (first-order factors) caused by real objects (the actual variables).

The *first* second-order analysis was based on the sample of scores of 1,788 standardization subjects on the 25 CBI scales. Eight first-order factors (λ_8 = .976) were extracted from the correlation matrix, and then rotated to the promax-criterion using a pivot power of three. Four second-order factors (λ_4 = .999) were then extracted from the inter-factor correlation matrix and rotated to the varimax-criterion.

To avoid interpreting "shadows of shadows", the first-order factor pattern matrix was postmultiplied by the second-order factor

pattern matrix (Gorsuch, 1983), and the product matrix was then rotated to the varimax-criterion (Thompson, 1990). These results are presented in Table 1.

Table 2 presents the Schmid and Leiman (1957) solution for this analysis, which provides yet another vehicle to interpret the second-order factors directly in terms of the original 25 scales. In addition to presenting these second-order factors (labelled "A" through "D"), the solution also presents the first-order factors (labelled with Roman numerals) after they are residualized of all variance present within the four second-order factors.

The *second* second-order analysis was based on a sample of scores of 251 university subjects on the 25 CBI scales. Eight first-order factors ($\lambda_8 = 1.052$) were extracted from the correlation matrix, and then rotated to the promax-criterion using a pivot power of three. Four second-order factors ($\lambda_4 = .931$) were then extracted from the inter-factor correlation matrix and rotated to the varimax-criterion.

The varimax-rotated product matrix is reported in Table 3. Table 4 presents the Schmid and Leiman (1957) solution for this analysis.

Discussion

Prior to interpreting the study's results, it should be noted that factor invariance does not presume that constructs will always emerge in a given order. Rather, our primary expectation is that the constructs themselves will consistently emerge as identifiable replicable entities, even though factor order may be somewhat

variable across samples.

Interpretation

The varimax-rotated second-order product matrices for the standardization sample (n=1,788) and the university sample (n=251) were presented in Tables 1 and 3, respectively. In both the standardization sample and the university sample, a *Vocational Achievement* factor emerged as the strongest factor with variance-accounted-for traces of 3.58 and 4.14, respectively. For the standardization sample, the Vocational Achievement factor emerged as Factor B in the solution reported in Table 1. For the university sample, the Vocational Achievement factor emerged as Factor D in the solution reported in Table 3. Thus, this factor emerged consistently across data sets.

As reported in Tables 1 and 3, the CBI scales most associated with the factor across the two samples included: Working Hard (r_s = +.661 and +.671, respectively), Persisting while Uncertain (r_s = +.530 and +.726, respectively), Overcoming Obstacles (r_s = +.665 and +.572, respectively), Openness (r_s = +.566 and +.563, respectively), Achievement (r_s = +.405 and +.654, respectively), and Control (r_s = +.653 and +.392, respectively). The factor measures aspects of ambition and motivation inherent in successful pursuit of career objectives.

The second strongest factor for the standardization sample and the university sample had traces of 2.24 and 2.21, respectively, and was labeled *Job Flexibility*. The construct emerged as factors C and B, respectively.

As reported in Tables 1 and 3, the CBI scales most associated with the factor across the two samples included: Job Experimentation (r_s = +.693 and +.616, respectively), Acceptance of Uncertainty (r_s = +.596 and +.736, respectively), Career Plans (r_s = +.572 and +.593, respectively), Post-Training Transition (r_s = +.610 and +.469, respectively), and Career Path Flexibility (r_s = +.435 and +.447, respectively). The factor measures an openness to stimulation associated with experimentation and change.

The third strongest factor for the standardization sample and the university sample had traces of 1.62 and 1.72, respectively, and was labeled *Job Satisfiers*. The construct emerged as factors A and A, respectively. However, the comparability of structure across the two samples was considerably weaker for this factor.

As reported in Tables 1 and 3, the CBI scales most associated with the factor across the two samples included: Intrinsic Satisfaction (r_s = +.592 and +.472, respectively), Relocation (r_s = -.579 and -.359, respectively), Occupation/College Variation (r_s = +.503 and +.286, respectively), and Career Path Flexibility (r_s = +.410 and +.222, respectively). The factor appears to measure sources of job satisfaction.

For the standardization sample, the remaining factor (D) had a trace of 1.38, as reported in Table 1. The CBI scales most associated with the factor included: Structured Work Environment (r_s = +.673), Peer Equality (r_s = +.540), and Post-Training Transition (r_s = +.350).

For the university sample, the remaining factor (C) had a

trace of 1.73, as reported in Table 3. The CBI scales most associated with the factor included: Approval of Others (r_s = +.599), Self-Others Comparison (r_s = +.500), Relocation (r_s = +.480), Improving Self (r_s = -.450), and Peer Equality (r_s = +.439). The factor appears to measure ties to others for approval and support.

The Schmid and Leiman (1957) solutions reported in Tables 2 and 4 can be consulted to augment these interpretations. The solutions are particularly useful for evaluating what variance is left behind only in the first-order structure, given the extraction of the second-order factors.

For both solutions most of the residualized first-order factors have very limited trace variance remaining, following the extraction and residualization using the second-order factors. However, factors I and II were reasonably well replicated across the two solutions, although the trace (1.23) was largest for residualized factor I for the standardization sample and the trace (1.17) was largest for residualized factor II for the university sample.

Residualized first-order factor I involved scales such as Working Hard (r_s = +.404 and +.317, respectively), Persisting while Uncertain (r_s = +.405 and +.273, respectively), Taking Risks (r_s = +.393 and +.227, respectively), and Learning Job Skills (r_s = +.378 and +.274, respectively). Most of these scales are components of the fifth logical heading of scales that Krumboltz (1991) labelled, "Effort I am Willing to Initiate".

Residualized first-order factor II involved scales such as College Education (r_s = +.225 and +.400, respectively), Career Path Flexibility (r_s = +.311 and +.491, respectively), Post-Training Transition (r_s = +333. and +.563, respectively), and Job Experimentation (r_s = +.289 and +.480, respectively). The last two of these scales are components of the fourth logical heading of scales that Krumboltz (1991) labelled, "Change I am Willing to Make".

Conclusions

John Krumboltz integrated social learning theory and classical behaviorism into career counseling with the presentation of a social learning theory model of career decision making (SLTCMD) (Krumboltz, 1981). The purpose of the model was to explain how people acquire information about careers, come to be employed in an occupation, and also to suggest possible counseling interventions that might help people make satisfactory career decisions (Krumboltz & Nichols, 1990).

According to Krumboltz (1983), there are private rules, or beliefs, about career decision making. These private rules involve the self, e.g., "I'm not a motivated person," careers, e.g., "All business school majors are self-confident and assertive," and decision making, e.g., "Other people will know more about me and make better decisions for me than I could make for myself." These beliefs can interfere with the career decision-making process (Dorn & Welch, 1985), defined in social learning theory as the process of selecting goals, determining strategies to attain defined goals,

and maintaining progress toward those goals.

It is necessary to identify client's irrational career beliefs during career counseling. Some beliefs are based on one particularly vivid experience that may or may not be representative of the occupational world at large (Krumboltz & Nichols, 1990) or of a person's true ability to participate in the working world. More central, resilient core self-beliefs may lead clients to limit their learning experiences, make unfounded assumptions about their abilities, discount their interests in certain careers, and ignore viable career options (Borders & Archadel, 1987).

Because clients many times do not self-reflect on their beliefs, it is necessary to determine a client's beliefs through more indirect ways than simply asking (Savickas, 1991). The Career Beliefs Inventory (CBI; Krumboltz, 1991, 1994) provides one means to help identify client's beliefs about the work world and their abilities to participate in it. However, only limited research (cf. Vacha-Haase, Dolenz, Kapes, Dresden, Thomson, Ocho-Shargey, & Miller, 1993) has been conducted on the CBI, because the measure is relatively new.

The CBI has promise as an important measure for use in career counseling or in research regarding career choice, because the measure has a somewhat unique focus on career-related *beliefs*. Regrettably, the analyses reported here are not particularly supportive of a conclusion that CBI scores are valid. Confirmatory tests of theoretical models did not fit our data very well, and results of the exploratory second-order analyses did not reproduce

the limited previously reported exploratory factor analytic results.

Nevertheless, replicable constructs were isolated in the present study across our two samples, as noted previously. Thus, the present study represents another initial effort to identify the structures underlying career beliefs. On-going continuing investigations of career beliefs are warranted, because of the potential important contributions the use these constructs may make in various career counseling applications, once the constructs are more fully identified. Ultimately, replication of factor structures across samples may lead to better scoring keys, and to the development of more elaborate theories regarding career-related systems of beliefs.

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Table 1
Varimax-Rotated Product Matrix
for the Standardization Sample Data
(n=1,788; v=25)

Scale		Factor A	B	C	D	h^2
EMPLST1	'Employment Status'	.291	.284	.063	-.212	.214
CARPLA2	'Career Plans'	.037	**-.343**	**.572**	-.170	.475
ACCEPT3	'Acceptance of Uncertainty'	.103	-.012	**.596**	-.081	.373
OPENNE4	'Openness'	.154	**.566**	-.014	.027	.346
ACHIEV5	'Achievement'	-.190	**.405**	-.110	-.219	.260
COLLED6	'College Education'	.022	-.061	**.404**	.081	.174
INTSAT7	'Intrinsic Satisfaction'	**.592**	.203	.034	-.203	.435
PEEREQ8	'Peer Equality'	.092	-.197	.076	**.540**	.344
STRWKE9	'Structured Work Environment'	-.167	.155	-.012	**.673**	.505
CNTRL10	'Control'	.037	**.653**	-.267	.057	.502
RESPO11	'Responsibility'	.200	**.331**	**-.357**	.028	.278
APPRO12	'Approval of Others'	-.272	**.442**	.127	-.051	.288
SFOTH13	'Self-Others Comparison'	.002	.298	.127	.069	.110
OCCUP14	'Occupation/College Variation'	**.503**	**.331**	.153	.084	.393
CARFX15	'Career Path Flexibility'	**.410**	.110	**.435**	**.331**	.479
POSTR16	'Post-Training Transition'	.146	.189	**.610**	**.350**	.552
JOBEX17	'Job Experimentation'	-.073	.189	**.693**	-.037	.523
RELOC18	'Relocation'	**-.579**	.239	.151	.076	.422
IMPRO19	'Improving Self'	.230	-.044	.049	.065	.062
PERSI20	'Persisting while Uncertain'	-.143	**.530**	-.027	.015	.302
TKRIS21	'Taking Risks'	.014	**.483**	.178	.179	.297
LRNJB22	'Learning Job Skills'	.004	.273	-.053	**.333**	.189
NEGOT23	'Negotiating/Searching'	.222	**.497**	-.034	-.085	.305
OVRCO24	'Overcoming Obstacles'	-.016	**.665**	-.073	-.088	.456
WKHRD25	'Working Hard'	.230	**.661**	-.049	.188	.527
Trace		1.62	3.58	2.24	1.38	

Table 2
Schmid and Leiman (1957) Solution
for the Standardization Sample Data
(n=1,788; v=25)

		Second-Order Factors				First-Order Factors								
Scale		A	B	C	D	I	II	III	IV	V	VI	VII	VIII	h^2
EMPLST1	'Employment Status'	.195	.200	.035	**-.367**	-.038	.008	-.017	.005	-.120	-.056	**.522**	.062	.510
CARPLA2	'Career Plans'	-.207	**-.312**	**.547**	-.188	-.154	.033	.028	**.420**	.082	.160	.047	-.035	.712
ACCEPT3	'Acceptance of Uncertainty'	-.044	-.003	**.578**	-.192	-.035	.143	.073	.246	.108	.057	.043	-.057	.481
OPENNE4	'Openness'	.263	**.510**	-.021	-.126	.281	-.047	.054	.038	.188	.014	.139	.036	.487
ACHIEV5	'Achievement'	-.162	**.425**	-.182	-.142	**.399**	-.073	.019	.041	-.215	.023	-.085	-.063	.485
COLLED6	'College Education'	-.017	-.038	**.415**	.018	-.040	.225	-.036	-.027	.051	-.247	-.034	-.037	.295
INTSAT7	'Intrinsic Satisfaction'	**.441**	.046	.038	**-.486**	.183	.031	-.135	.001	.028	.247	-.010	-.194	.586
PEEREQ8	'Peer Equality'	.280	-.192	.189	**.440**	-.168	.059	.018	-.022	**.457**	.028	-.180	.109	.630
STRWKE9	'Structured Work Environment'	.211	.210	.089	**.639**	.092	.020	-.007	.035	.070	.008	.107	**.368**	.667
CNTRL10	'Control'	.235	**.608**	-.278	-.025	.158	-.057	.246	-.207	.138	.116	.040	-.002	.668
RESPO11	'Responsibility'	**.305**	.250	**-.342**	-.071	-.050	.059	.088	**-.451**	-.005	-.055	.033	-.077	.505
APPRO12	'Approval of Others'	-.181	**.500**	.072	.007	-.032	.014	**.422**	-.051	.193	.022	-.013	-.035	.509
SFOTH13	'Self-Others Comparison'	.077	.298	.124	.001	**.145**	-.037	.082	.097	**.520**	-.202	-.054	-.018	.463
OCCUP14	'Occupation/College Variation'	**.510**	.209	.193	-.229	.131	.122	-.098	-.025	-.086	.170	.256	.035	.539
CARFX15	'Career Path Flexibility'	**.459**	.042	**.516**	.023	-.030	**.311**	-.029	-.097	.035	.106	.018	.008	.599
POSTR16	'Post-Training Transition'	.235	.194	**.665**	.130	.071	.333	.026	.011	.024	-.014	-.008	.054	.672
JOBEX17	'Job Experimentation'	-.145	.242	**.657**	-.111	.095	.289	.094	.111	-.153	-.087	.028	-.042	.671
RELOC18	'Relocation'	**-.426**	**.385**	.102	.286	.043	.054	**.340**	.016	-.296	.140	-.072	.095	.664
IMPRO19	'Improving Self'	.208	-.094	.081	-.052	-.045	-.020	.084	**.121**	-.152	**.626**	-.042	.003	.502
PERSI20	'Persisting while Uncertain'	.001	**.546**	-.059	.010	**.405**	.011	-.013	-.029	-.050	-.203	.021	.037	.513
TKRIS21	'Taking Risks'	.171	**.480**	.186	.059	**.393**	.051	.001	.097	.110	-.005	-.049	.051	.480
LRNJB22	'Learning Job Skills'	.226	.270	-.003	.254	**.378**	.042	-.080	-.030	.053	.086	-.293	.029	.437
NEGOT23	'Negotiating/Searching'	.256	**.421**	-.052	-.242	.284	-.037	-.044	.031	.012	-.006	.223	.023	.440
OVRCO24	'Overcoming Obstacles'	.095	**.640**	-.119	-.152	**.323**	.038	.125	-.156	-.098	-.025	.031	-.052	.615
WKHRD25	'Working Hard'	**.428**	**.585**	-.024	-.032	**.404**	.064	-.023	-.114	.033	.040	.034	.032	.713
Trace		1.79	3.26	2.35	1.41	1.23	.41	.45	.59	.83	.72	.57	.23	13.84

Note. The column after the orthogonalized matrix presents the sum of the squared entries in a given row. The first 4 columns represent the second-order factors. The next 8 columns represent the first-order solution, based on variance orthogonal to the second order (Gorsuch, 1983, pp. 248-254).

Table 3
Varimax-Rotated Product Matrix
for the University Sample Data
(n=251; v=25)

Scale		Factor A	Factor B	Factor C	Factor D	h^2
EMPLST1	'Employment Status'	-.033	-.002	-.234	-.062	.060
CARPLA2	'Career Plans'	-.107	**.593**	-.198	**-.423**	.581
ACCEPT3	'Acceptance of Uncertainty'	-.046	**.736**	-.101	-.020	.554
OPENNE4	'Openness'	.153	-.252	.001	**.563**	.404
ACHIEV5	'Achievement'	.015	.033	-.052	**.654**	.431
COLLED6	'College Education'	**-.312**	.010	.020	-.095	.107
INTSAT7	'Intrinsic Satisfaction'	**.472**	.152	.000	**.353**	.371
PEEREQ8	'Peer Equality'	-.172	.031	**.439**	**-.402**	.385
STRWKE9	'Structured Work Environment'	**-.475**	.053	.021	**.318**	.330
CNTRL10	'Control'	**.390**	-.106	**.331**	**.392**	.427
RESPO11	'Responsibility'	**.519**	-.249	.148	.058	.356
APPRO12	'Approval of Others'	.038	.129	**.599**	.097	.387
SFOTH13	'Self-Others Comparison'	**.318**	**.396**	**.500**	-.105	.519
OCCUP14	'Occupation/College Variation'	.286	.247	-.210	**.513**	.450
CARFX15	'Career Path Flexibility'	.222	**.447**	.029	-.027	.251
POSTR16	'Post-Training Transition'	-.156	**.469**	.164	-.011	.271
JOBEX17	'Job Experimentation'	-.189	**.616**	.125	.202	.471
RELOC18	'Relocation'	**-.359**	.082	**.480**	.227	.418
IMPRO19	'Improving Self'	-.086	.266	**-.450**	.144	.301
PERSI20	'Persisting while Uncertain'	.020	.090	.032	**.726**	.537
TKRIS21	'Taking Risks'	-.067	.023	.199	**.482**	.277
LRNJB22	'Learning Job Skills'	-.139	-.113	.292	**.513**	.381
NEGOT23	'Negotiating/Searching'	-.085	-.050	-.097	**.680**	.482
OVRCO24	'Overcoming Obstacles'	**.401**	-.129	.155	**.572**	.528
WKHRD25	'Working Hard'	.241	.048	.099	**.671**	.520
Trace		1.72	2.21	1.73	4.14	

Table 4
Schmid and Leiman (1957) Solution
for the University Sample Data
(n=251; v=25)

Scale		Second-Order Factors				First-Order Factors								h^2
		A	B	C	D	I	II	III	IV	V	VI	VII	VIII	
EMPLST1	'Employment Status'	-.080	-.108	.150	-.139	-.020	.110	-.039	**-.515**	.236	.215	.001	.129	.459
CARPLA2	'Career Plans'	**-.414**	**.417**	.152	**-.461**	-.242	.078	.043	.006	-.206	.071	-.120	.148	.732
ACCEPT3	'Acceptance of Uncertainty'	**-.302**	**.587**	**.326**	-.109	-.057	**.303**	-.007	.231	-.255	-.016	-.080	.119	.789
OPENNE4	'Openness'	**.344**	-.196	.199	**.456**	.182	-.018	.001	**.301**	.080	-.013	.166	.014	.563
ACHIEV5	'Achievement'	.136	-.007	**.364**	**.529**	.100	-.030	.126	-.030	-.011	**.540**	.009	-.063	.754
COLLED6	'College Education'	**-.303**	-.057	-.105	.022	-.066	**.400**	.083	-.020	.068	-.052	**.320**	-.067	.392
INTSAT7	'Intrinsic Satisfaction'	**.455**	.239	.294	.143	-.021	.070	.018	**.471**	.067	.105	.014	-.021	.614
PEEREQ8	'Peer Equality'	-.183	.182	**-.553**	-.113	.008	.098	.029	-.073	-.006	**-.437**	-.087	-.060	.603
STRWKE9	'Structured Work Environment'	-.375	-.071	.079	**.422**	.264	.041	.026	-.202	-.135	-.124	.034	.195	.515
CNTRL10	'Control'	**.526**	.134	-.053	**.359**	.103	-.051	.111	.069	.299	.029	-.100	.032	.558
RESPO11	'Responsibility'	**.588**	-.028	-.098	-.028	-.033	-.019	.021	-.028	**.457**	-.016	-.024	.034	.569
APPRO12	'Approval of Others'	.109	**.375**	**-.376**	**.305**	.008	.023	.294	.080	.171	-.156	-.105	.074	.550
SFOTH13	'Self-Others Comparison'	.216	**.639**	-.253	-.017	.016	.101	.028	-.068	.077	-.102	**-.397**	-.068	.714
OCCUP14	'Occupation/College Variation'	.256	.182	**.541**	.242	.098	.175	-.049	.284	.041	.121	.059	.139	.612
CARFX15	'Career Path Flexibility'	.054	**.457**	.159	-.119	-.005	**.491**	-.081	.002	.160	-.111	-.020	.064	.541
POSTR16	'Post-Training Transition'	-.271	**.440**	.008	.065	.046	**.563**	-.034	-.024	-.073	-.082	.027	-.115	.618
JOBEX17	'Job Experimentation'	**-.309**	**.538**	.187	.228	.032	**.480**	.081	.038	-.146	.130	-.004	-.046	.751
RELOC18	'Relocation'	-.226	.182	-.299	**.494**	-.042	-.029	**.445**	-.001	.005	.184	.046	-.001	.654
IMPRO19	'Improving Self'	-.205	.015	**.505**	-.059	.025	-.087	.016	-.071	.023	-.020	.023	**.555**	.624
PERSI20	'Persisting while Uncertain'	.151	.078	**.353**	**.619**	.273	.039	.006	-.036	-.041	.267	-.071	.005	.692
TKRIS21	'Taking Risks'	.068	.075	.068	**.512**	.227	.164	.001	-.115	-.017	.168	-.039	-.156	.423
LRNJB22	'Learning Job Skills'	.068	-.022	-.051	**.611**	.274	-.024	.071	.061	-.043	-.077	-.003	-.011	.473
NEGOT23	'Negotiating/Searching'	.071	-.124	**.367**	**.572**	.275	-.029	.007	.020	-.023	.111	.060	.153	.598
OVRCO24	'Overcoming Obstacles'	**.554**	.037	.164	**.440**	.214	-.061	-.066	.155	.088	.124	-.117	-.124	.658
WKHRD25	'Working Hard'	**.364**	.125	.293	**.535**	.317	.068	-.088	.067	.059	.019	-.108	.044	.655
Trace		2.37	2.04	2.03	3.37	.63	1.17	.36	.83	.60	.82	.38	.53	15.11

Note. The column after the orthogonalized matrix presents the sum of the squared entries in a given row. The first 4 columns represent the second order factors. The next 8 columns represent the first order solution, based on variance orthogonal to the second order (Gorsuch, 1983, pp. 248-254).