CROWN FINANCIAL MINISTRIES

RESEARCH AND DEVELOPMENT TECHNICAL SUMMARY for *Career Direct*®

I. TECHNICAL INFORMATION ON THE *Career Direct*® PERSONALITY SECTION

The Personality Section of the *Career Direct*® Report is a personality inventory appropriate for vocational counseling consisting of six general scales with multiple subscales. Additional scales cover Life Stress, Indebtedness, and Financial Management.

(1) Development

Development of the Personality Section began with the identification of items for every dimension of personality that could be imagined and then by administering an inventory of those items through several iterations to large samples. The resulting factor analysis consistently revealed the presence of six major personality dimensions. The six factors are Dominance, Extroversion, Compassion, Conscientiousness, Adventurousness, and Innovation. Names for the overall dimensions were based on the general thrust of the items in the dimensions. Next, adjectives were chosen to describe both ends of the dimension. Dimensions comprise a continuum of behaviors. For instance, compliant - mid-range - dominant, or introverted - mid-range - extroverted. Individual scores are shown at points on this continuum, based on their scores compared to the norm or the standard of the population that was measured.

(2) Design Process

1. Both a rational approach and a principal component factor analytic approach were used to develop the inventory.
2. Psychologist consultants began by defining all known traits used to describe personality.
3. Once all trait dimensions had been defined, items were written in different formats to rationally measure those dimensions.
4. The single word adjective format was chosen over alternative formats; test individuals preferred the single words and researchers found the resulting factors to be clearer to interpret.
5. Factors of personality dimensions were developed from the sample subjects' responses using many statistical analyses. These included principal components factor analyses, with rotated varimax factors. These analyses grouped the words by the major factors that resulted.
6. Both item level and dimension level analyses were used to select the best words to measure the dimensions (factors). Words that were not highly correlated to the factors or which were duplicates or redundant were dropped.
7. Subfactors for each factor were also developed from this process, yielding a total of sixteen subfactors within the six personality factors.

(3) Samples

1. Six different samples of adults and youth (N=4,105) were used in revising and defining the Personality Section.
2. The final sample of adults (N = 1,048) was selected on the basis of self-satisfaction and relative success in an occupational field in which the person had been for at least three years.
3. The final youth sample (N = 572) were a group who were 23 years of age or younger who were primarily college freshmen from 26 college and universities representing all regions of the country.

(4) Format

1. Personality / Life Stress items consist of 116 adjectives which are self-rated on a scale: "Not at all like me" to "Very much like me."
2. The Money/ financial scales consist of 14 statements self-rated as the adjectives.

(5) Scoring

1. Raw scores for each factor (six personality, one life/stress, and two financial) and subfactor (sixteen, two or three for each factor) are the sum of the numerical responses marked for each word of the factor (a five-

word factor with all "5's", "very much like me" responses has a raw score of twenty-five; all "1's", "not at all like me" responses results in a raw score of five).

2. Standardized "T"scores were derived from the raw scores of the standardization sample for adults and youth (see final sample described above in "Samples"). The conversion formula for "T" standard scores is: T score = ((x-m)/ s)(S) + M, where   x = raw score, m = sample mean, s = sample standard deviation, S = Standard t-score deviation of 10 and M = standard t-score mean of 50.

3. Standardized scores insure that all scores are on the same scale of reference and therefore can be meaningfully compared and contrasted. Standardized T-scores put all scores on a scale where the mean or midpoint is 50 and almost all scores fall between 20 and 80.

4. Within the scoring program, T-score conversion tables for adults and youth exist for each factor and subfactor for converting raw scores to standardized T-scores.

(6) Scales

1. Using a T-score scale, low scores of below 20 were rounded up to 20 and high scores above 80 were rounded down to 80, making twenty the lowest possible score and 80 the highest. Fifty is the mean and the standard deviation is 10. One standard deviation above is 60, and one standard deviation below is 40.

2. The report sets the cutoff points for low and high at 45 and 55, respectively (½ standard deviation).

3. Low scores are 44 and below, mid-range are 45 to 55, and high are 56 and above.

4. These categories place approximately one-third of the scores in the low category, one-third in the mid-range, and one-third in the high range.

(7) Report Sections

1. <u>Personality Highlights</u>. The report begins with the personality highlights based on the six factors (dominance, extroversion, compassion, conscientiousness, adventurousness, and innovation). The report begins with the factor on which an individual had the most extreme score, i.e., the greatest distance from 50. Therefore, the dimension reported on should be the one that most impacts the person's behavior, which could be a low if they had an item that scored at 22, which would be 28 points below the mid-range of 50.

2. <u>Strengths & Weaknesses</u>. <u>Typical strengths</u> is the next section. These are generated from the sixteen subfactors that relate to the six personality factors. The <u>typical weaknesses</u> section which follows is also derived from the sixteen subfactors. A strength and corresponding weakness sentence is generated for each subfactor for which there is a high or low score. There are no statements in the strengths and weaknesses section for a subfactor if an individual's score is in the mid-range section of a subfactor. Therefore, if a client has a lot of balanced subfactors, they will have a lower number of strengths and weaknesses listed in the report.

3. <u>Career Implications</u>. The career implications section is generated from the six major factors, not the subfactors. Appropriate career area descriptions are determined by low, mid-range, or high scores on the factors.

4. <u>Critical Life Issues</u>. The critical life issues section contains the stress dimension, which is designed to help the person recognize that stress often accompanies transitions in a career. Paragraphs are determined by a low, mid-range, or high score on the stress factor.

The indebtedness and financial management sections consist of paragraphs based on the low, mid-range, or high scores on the two money factors.

5. <u>Summary</u>. The final part of the Personality Section is the summary. There is a bullet for each of the six major factors indicating the low, mid-range, or high range in which the score falls and a brief summary of each particular dimension. A bar graph shows the dimensions and actual scores. The intent of the summary is to provide a quick overview of the Personality Section.

6. <u>Personality Summary page</u>. The summary page is a one-page recap of all the information gleaned from the Personality Section. It contains Factors, Subfactors, and Life Issues.

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(8) Validity Evidence

Construct Validity: To provide evidence of construct validity, the instrument was correlated with Hogan's (1986) Personality Inventory and Costa and McCrae's (1985) measure of the "Big Five," the NEO-PI.

1. Extroversion strongly related to the NEO-PI's measure of extraversion r= .82, p < .0001) and Hogan's measures of sociability r= .52, p < .0001) and ambition r= .52, p < .0001).

2. Conscientiousness correlated highly with the NEO-PI's measure of conscientiousness r= .78, p < .0001) and moderately with the Hogan's measure of prudence r= .44, p < 0001).

3. Compassion significantly related with the NEO-PI's agreeableness r= .57, p < .0001) and the Hogan's likability scale r= .61, p < .0001).

4. Adventurousness moderately related to the NEO-PI's extroversion r= .51, p < .0001) and the Hogan's ambition scale (N = .55, p < .0001).

5. Dominance correlated moderately with the NEO-PI's extroversion r= .33, p < .0001) and conscientiousness r= .36, p < .0001). Further, the scale correlated moderately with Hogan's ambition scale r= .54, p < .0001).

6. Innovation correlated moderately with the NEO-PI's openness r= .47, p < .0001) and with the Hogan's intellectance scale r= .55, p < .0001).

7. Correlations of the Personality Report factors of extroversion, conscientiousness, adventurousness, dominance, and innovation scales, with the Marlowe-Crowne scale of social desirability were negligible with a range from r = .05 to r = .19. Compassion r= -.32, p < .0001) and stress r= .32, p < .0001) were somewhat higher, but these were still acceptable and lower than the correlations between the NEO-PI scales and the Hogan scales with social desirability.

8. Stress highly related to the NEO-PI's measure of neuroticism r= .81, p < .0001) and the Hogan's adjustment scale (r = .74, p < .0001).

Emperical validity: Further evidence of validity was provided by client responses to evaluation surveys included in the returned feedback reports.

1. Accuracy of the personality factors rated by the clients themselves ranged from 92% to 96%, accuracy of the strengths, 97%, accuracy of the weaknesses, 83%, and overall helpfulness of the report, 96%. The lower perceived accuracy of the weaknesses led to changes in the text to make the statements less conflicting.

2. Accuracy of the personality factors rated by a close acquaintance or spouse ranged from 87% to 93%, accuracy of the strengths, 94%, and accuracy of the weaknesses, 71%. Again, changes were made in the text to make the statements less conflicting.

(9) Reliability Evidence

1. Internal Consistency Cronbach Alpha ranged from .86 to .94 for the personality general factor scales, and .76 to .92 for the personality subfactor scales (n = 4463).

2. Test-retest Reliability mean correlation and range:

Time Frame	General Factors	Subfactors
1 week (n = 100)	.91, .86 to .95	
3-6 weeks (n = 166)	.87, .85 to .90	.83, .65 to .90
6 months (n = 75)	.84, .81 to .86	.78, .60 to .87
1 year (n = 50)	.82, .80 to .86	.61, .58 to .87

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II. TECHNICAL INFORMATION ON THE *Career Direct*®INTERESTS, SKILLS, AND VALUES SECTIONS

The Interests, Skills, and Values Sections of the Report measure Interests (Activities, Educational Subjects, Occupations); Skills/Abilities, Life Values, and Work Values.

(1) Design Process

1. Both a rational approach and a principal component factor analytic approach were used to develop the inventory.
2. Psychologist consultants began by defining the general dimensions of interests, skills, and values.
3. Next, items were written to rationally measure these dimensions, covering all aspects of work, ranging from the most sophisticated to the most mundane.
4. Factors of activities, occupations, subjects, and skills dimensions were developed from the sample subjects' responses using various statistical analyses. These included principal components factor analyses using a rotated varimax procedure. These analyses helped group the items into factors. Activities have 36 factors, occupations have 22 factors, and skills have 14 factors. There are also 18 educational subjects in the Interests, Skills, and Values sections.
5. Both item level and dimension level analyses were used to select the best items to measure the factors. Items that were duplicates, redundant, or not highly correlated to the factors were dropped.
6. Factor analysis was used to group the activities, occupations, and subjects factors into 21 General Interests Career Group dimensions.

(2) Samples

1. A sample (N = 3,859) consisting of a diverse population was used to revise and refine the Interests, Skills, and Values Section from the initial inventory format.
2. A sample (N = 1,048) of adults took the Personality, Interests, Skills, and Values Sections, along with the Strong Interest Inventory for construct validity with the Strong Interest factors. This sample was selected on the basis of satisfaction and relative success in an occupational field in which the person had been for at least three years.
3. A youth sample (N = 572) were a group who were 23 years of age or younger who were primarily college freshmen from 26 colleges and universities representing all regions of the country.
4. In 1997, the Interests, Skills, and Values Sections were further refined on a client sample of 3841 adults and 2540 youth. Item and dimension level analyses were again used to delete items that were redundant or heterogeneous with the other items on a factor. In addition, these large samples allowed investigation of gender and age differences in the factor structure of the Interests, Skills, and Values Section. In order to have identical factors for all groups, items that were unstable across gender or age were deleted. New items were written and added to the inventory based on a rational approach, with the intention of data collection and future re-analysis of the factor composition. A revised inventory was printed and a new computer program (ISVI4) was written to include: (1) updating the report and incorporating expanded report feedback, (2) Windows95 format and updating the database from MSAccess2.0 to MSAccess97, and (3) collecting of the new data items.
5. In 1998, a sample set of 8,870 *Career Direct* clients was randomly selected from the client database of the ISVI4 (1997 revision). The sample sets were separated into adult and youth samples, and equated for gender in each age group. Items in each category were re-analyzed using factor analysis and item analysis techniques. Based on these analyses, decisions were made to revise and/ or re-name several activity, occupation, general interest, and skill groups and to incorporate the changes in the next revision of the assessment (ISVI5). Several factors incorporated the new items added in 1997, strengthening and refining the composition of these factors.
6. In 1999, the CD-ROM version of *Career Direct* was introduced, which incorporated the changes in factors decided upon for the fifth version of the ISVI portion of the assessment (ISVI5) as described in item 5. above. The CD-ROM version substantially changed the report format, combining the personality and interests, skills, and values sections together in one report for the first time.

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(3) Format

1. The Activities section consists of 192 phrases, the Educational Subjects consists of 18 areas, and the Occupations section consists of 116 job titles. These sections are self-rated on a scale: "Dislike very much" to "Like very much."
2. The Skills section consists of 74 phrases which are self-rated on a scale: "No skill" to "Very strong skill". The Work Environment (12 items), Work Expectations (8 items), and Life Values (9 items) sections are prioritized and rank ordered.

(4) Scoring

1. Raw scores for each factor (36 activities, 22 occupations, 18 subjects, 14 skills, and 21 General Interest Groups) are the sum of the numerical responses marked for each item of the factor. For example, a five-word factor with all "5's", (very much like me) has a raw score of twenty-five; all "1's", (not at all like me) results in a raw score of five).
2. Average scores for each factor are derived by dividing the raw score by the number of items in a factor. This yields an average of the item responses which is then converted to a 20- 80-scale with $1 = 20$, $3 = 50$, and $5 = 80$.
3. Scores on a 20 - 80- scale insure that all factor scores are presented on the same scale of reference and therefore can be meaningfully compared and contrasted.

(5) Scales

1. Using the score scale of 20 to 80, 20 is the lowest possible score and 80 is the highest. Fifty indicates an average item score of 3 on a factor.
2. The report sets the cutoff points for low and high at 44 and 56.
3. Low scores are 44 and below, mid-range are 45 to 55, and high are 56 and above.

(6) Validity Evidence

1. General Interest Factors were tested for construct validity with the Strong Vocational Inventory scales. Simple correlations between appropriate factors were all positively related at a significant level.
2. Analyses were conducted to assess construct validity based on client responses to evaluation surveys included in the returned feedback reports.
    a. Interests, Skills, and Values sections-
       (1). Accuracy of the Interests scores, 90%.
       (2). Accuracy of the Skills scores, 87%.
       (3). Helpfulness of the Values sections: Work Environment, 91%, Work Outcomes, 89%, and Life Values, 99%.
       (Note-- The majority of these clients purchased the assessment and received the first version (616 of 676). A major revision was introduced in 2/97 resulted in a much smaller response rate. As a result of the feedback and further analysis of the data, another major revision was introduced as of 8/1/97.
3. Construct validity studies:

    a. Simple correlations were calculated between *Career Direct* Occupational Factors and the Strong Vocational Inventory scales. The full table consisted of 240 Strong scales and 22 Career Direct Occupational scales. A subset of the table with correlations (r) above .30 (plus or minus) between the Strong Holland (RIASEC) scales and Career Direct scales are as follows (N = 1002, normative sample of working adults, 1995):

Career Direct Occupational Scales	Strong Realistic	Strong Investigative	Strong Artistic	Strong Social	Strong Enterprising	Strong Conventional
Skilled Technical Professional	0.87	0.47				
Outdoors	0.66	0.37				
Non-technical	0.48					
Adventure	0.64	0.46				
Fashion			0.56			
Service						0.45
Science		0.51	0.79			
Performers				0.65	0.38	
Writers/ Artists		0.32	0.78	0.35		
Management				0.44	0.77	0.50
Security	0.35					
Law/ Politics		0.35		0.42	0.48	
Counseling/ Education		0.36	0.36	0.75	0.35	
Animal Services	0.34	0.35				
Medical		0.44		0.36		
Financial		0.42				0.72
Foreign Service/ Languages		0.33	0.50	0.44	0.33	
Drivers	0.48					
Athletes	0.31			0.36		

Note 1: $p < 0.001$

Note 2: Composition and names of occupation factors have changed slightly as item adjustments have been made from 1995 to 1999.

b.   Data from the normative sample of working adults (N = 1002), 1995, were entered into multiple regression analyses to predict Strong individual occupational scales (105 scales, males and female) using *Career Direct* General Interest factor scores (21), Personality factors (compassion and extroversion) and personality subfactors (10) from the remaining four factors.
The adjusted R-squared statistic, which represents the amount of variance accounted for out of a total of 1.00, ranged from 0.52 (chiropractor) to 0.83 (computer programmer) for males, and 0.54 (librarian) to 0.86 (veterinarian) for females. Of the total, 59% of the 105 males scale equations yielded adjusted R-squares of 0.70 or greater, and 71% of the 105 female scale equations were 0.70 or greater. This indicates that a combination of *Career Direct* interests and personality factors explained a significant amount of variance on the Strong occupational scales.

c.   Doctoral dissertation, <u>Using Career Profiles to Differentiate Between Occupations and Predict Job Satisfaction, 1998 </u>by Cheryl Toth, Ph.D., IBM Global Systems.
Dr. Toth used the data from the Career Direct normative sample of working adults to investigate the person-job fit within occupational groups and differential occupational activity.

The research indicated that patterns of personality traits, vocational interests, and skills (abilities) influence preferences for particular occupations in Holland's occupational typology. Descriptive discriminant analysis combined the four domains of personality, interests, skills, and work values into one analysis to test the significance of the four aspects together in accounting for individual's preferences for different occupations. The results indicated that vocational interests, personality characteristics, and skills are significantly related to occupational preference and need to be incorporated into the assessment process to guide occupational choice. The investigation of predicting vocational choice with these multiple simultaneous predictors had not been evaluated prior to this study.

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Multiple regression analysis was used to investigate whether those variables that differentiate between occupations also contribute to job satisfaction based on satisfaction data collected at the same time as the *Career Direct* normative data. The results indicated that work values, while not contributing to occupational differentiation, did significantly contribute to satisfaction with one's job.

This comprehensive study of data from working adults concluded that in order to help persons improve the probability of making a satisfying career choice and to identify stable career paths, one should include all four domains of vocational interests, personality characteristics, skills/abilities, and work values.

The study is being prepared for submission to a major refereed journal.

(7) Reliability Evidence

Internal Consistency
1. Activities consist of 36 activity clusters with internal consistency (Cronbach Alpha) ranging from .78 to .93.
2. Occupations consist of 22 occupational clusters with internal consistency (Cronbach Alpha) ranging from .76 to .90.
3. Skills consist of 14 skill clusters with internal consistency (Cronbach Alpha) ranging from .70 to .90. Activity, Occupations, and Subject factors were combined into 21 General Interest clusters with internal consistency (Cronbach Alpha) ranging from .82 to .93.

Test - Retest
1. One month (n = 166)
   The mean correlation coefficient of the General Interests between the first and second administrations was .88 with coefficients ranging from .81 for International to .93 for Mechanical. These values indicate that the General Interests factors are stable over time. The reliability coefficients for the components comprising the General Interest factors (Activities, Occupations, and Subjects) are similar. For the 36 activity factors, the reliability coefficients ranged from .83 (Customer Service) to .94 (Athletic) with a mean of .88. The reliability coefficients for the 22 Occupational factors ranged from .80 for Languages to .91 for Adventure, with a mean correlation of .88. The 18 subject items had a mean of .79 and ranged from .69 to .88. The mean correlation for the 14 skill factors was .88, with a range from .84 for Managing to .94 for Musical skills.
2. Six months (n = 75)
   The mean correlation coefficient for the General Interests Scales between the first and second administration was .87, ranging from .79 for both International and Religious to .93 for Adventure. These values are similar to those from the first test-retest study and indicate that the factors demonstrate a very high degree of stability over a longer time interval. The mean correlations for the Activity, Occupational, and Subject factors for the six month retest study were also similar to those yielded in the study with a much shorter retest interval. The mean correlation for the Activity factors was .83 and ranged from .72 to .93. The Occupational factors yielded a mean correlation of .85 and ranged from .74 to .95. The mean correlation for the 14 skill factors was .86, with a range from .83 for Cross-cultural skills to .92 for Mechanical skills.
3. One year (n = 50)
   The mean correlation coefficient for the General Interests Scales between the first and second administration was .86, ranging from .68 for Religious to .92 for the Technological, Computational/Financial, and Security factors. The values are similar to those from the two shorter interval test-retest studies with only one hundredth of a correlation point reduction overall in the second six months. The mean correlations for the Activity, Occupational, and Subject factors for the one year retest study were also similar to those yielded in the study with a much shorter retest interval. The mean correlation for the Activity factors was .82 and ranged from .60 to .91. The Occupational factors yielded a mean correlation of .82 and ranged from .74 to .96. The mean correlation for the 14 skill factors was .81, with a range from .71 for Organizing skills to .87 for Mechanical skills. The correlations over one year again confirm a very high degree of stability over the longer time interval.

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