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ABSTRACT

The revision of the Strong Vocational Interest Blank (SVIB), the Strong-Campbell Interest Inventory (SCII), introduces Holland's theory of occupational types into the empirical structure of the SVIB. Emphasis on Holland's theory is evident throughout the SCII profile. Empirical coding of occupations was accomplished by: (1) scoring each of the occupational samples on the Holland scales; (2) correlating the Occupational Scales, the Basic Interest Scales, and the General Occupational Theme Scales; and (3) typing each occupation according to its highest General Theme scores while simultaneously considering the scale intercorrelations. The coded occupations were ordered on the new SCII profile in congruence with Holland's hexagonal model--Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Most of the Occupational Scales ordered themselves around the perimeter of the hexagon according to Holland's theory. Occasionally, occupations fell into unusual categories, emphasized differences in code-types for men and women, or resisted easy categorization. The exploration of these unusual occurrences is useful for counselors and clients who wish to gain more information about vocational interests. (Author/RC)

Coding Occupations According to Holland's Vocational Theory*

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In our excitement over revisions of the Strong such as:

-- merging the male and female booklets into a single form so that men and women now answer the same questions,

-- or eliminating sexist tinge from items such as secret service man, now called secret service agent; salesman, now called salesperson, and policeman, now called police officer,

-- and with the publication of the new Manual for the Strong-Campbell Interest Inventory which reflects a compulsive elimination of all generic terms,

-- as well as the complete revision of interpretive information and test-taking instructions for clients and counselors to avoid any suggestion that an occupation or activity or set of behaviors is more appropriate for one sex than the other,

in the excitement of all these changes, there is a tendency to forget, or at least to overlook, an important new feature -- the integration of a theory into the framework of the Strong -- which has affected the total look of the SCII and which, is also, a previously unknown feature for an empirical measurement instrument such as the Strong.

A paper presented at the meetings of the American Personnel and Guidance Association, New Orleans, April, 1974.

The integration of the Strong with a theory of vocational choice has been brewing for some time. Five years ago, in a paper on desirable characteristics of interest inventories, Campbell commented that career interest inventories should be tied into a theory which allows users to extrapolate beyond the specific test results, and at that time, he cited John Holland's theory of personality types as a workable integration of what is known about vocational choice with a testing system.

In 1972, the Campbell-Holland merger of Strong data and Holland's theory appeared in the form of six scales developed from Strong items that represented Holland's six personality types which are Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. As a result of this research, Holland-based scales, called General Occupational Theme Scales, were added to the existing Basic Interest Scales and Occupational Scales of the Strong. Extending this work, Campbell assigned each Occupational Scale a code type that corresponded to the highest General Occupational Theme scores of the people in that occupation, and organized the Basic Interest Scales according to their highest correlation with the six General Themes.

I would like to devote my time this afternoon to a brief review of the procedures used to code each Occupational scale, and to a presentation of a case study that demonstrates the integration of test scores around the Holland types.

The most important information used for coding the Occupational scales were the mean scores of each criterion sample on the six General Occupational Themes; next were the correlations between the Themes and

the Occupational scales; and then, the correlations between the Occupational scales and the Basic Interest Scales; and finally, the correlations between the Occupational scales themselves were considered.

Each Occupational scale could, potentially, be assigned up to three Holland types, if the criterion sample scored high on a sufficient number of Themes. Usually, only means of 53 or higher were considered in the coding, and if any question arose, for example, identical high scores on more than one scale, the next step was to consult Theme Scale and Occupational Scale correlations.

The Occupational Scale Codes provide counselors with added information for generalizing to similarly coded occupations, and also provide more information about differences between females and males in the same occupation. The assigned codes do distinguish male-female occupational differences. Many scales were assigned dissimilar codes for males and females; other occupations were coded similarly, although not identically, for females and males; and, of course, many of the scales were assigned identical codes for males and females.

The data in Tables 1, 2, and 3 are mean standard scores for the particular occupational criterion sample on each General Occupational Theme Scale. These data illustrate scales with identical male-female codes; coding was straight-forward and easily accomplished by following the coding guidelines: 1) consider only mean scores that are 53 or higher, and 2) assign no more than three types to an occupational sample. For example, both the female and male Artist scales were coded A based on the

high A-Theme or Artistic Theme scores for those two samples; the interests of male and female artists are like the interests of librarians, art museum directors, authors and musicians. The male and female Mathematician scales were coded with the I-theme in an equally easy manner, based on the lone high mean score on the Theme, Investigative; the interests of mathematicians are similar to other I-theme occupations such as biology, scientific research work, and technical writing.

The assigned code for the Occupational scale, Dentist, illustrates the procedure for assigning more than one code. The highest mean score represents the Primary code, in this case, Investigative, and the next highest score represents the Secondary Code, which is Realistic for dentists. Again, female and male scales were assigned identical codes, and are similar to other IR coded occupations -- chemistry, dental hygiene, and engineering.

Occasionally an occupational sample had more than three mean scores that were 53 or higher, or in some cases, two of the mean scores were identical. The male Medical Technologist sample presented in Table 4 is an example of both situations. In such cases, the correlations of the Theme Scales with the Occupational scale were examined before assigning a code. For example, the third type assigned to the male Medical Technologist scale was Conventional which correlated more highly with the male Medical Technologist scale than did the Theme, Social. This is also an illustration of dissimilarly coded male and female scales. These differences are useful for describing the nuances of vocational interests that differentiate men and women in the same occupation, as well as describing differences between

closely related occupations. For example, the Investigative-Realistic code assigned to the female criterion sample suggests that women in medical technology have interests similar to physicians, dentists, engineers, chemists, and pharmacists; however, the interests of men in medical technology are like the interests of optometrists or computer programmers.

Another example of an occupation coded dissimilarly for females and males is Registered Nurses presented in Table 5; males who are registered nurses are like men in other Realistic-Investigative occupations such as Veterinary medicine; whereas female registered nurses coded Social-Investigative are similar to women in related nursing professions, such as public health nurse.

Male Credit Managers are a final example of the use of Theme Scale and Occupational Scale correlations to determine primary and secondary types. Since the credit manager sample had identical high scores on Enterprising and Conventional, Theme scale and Occupational scale correlations were consulted, and, based on the higher correlation with Enterprising, the code Enterprising-Conventional-Social was assigned. The data for coding the credit manager scales are presented in Table 6. This is also another example of female and male differences in the same occupation; females coded Conventional-Enterprising, are like bankers, office workers, courtroom stenographers, and business education teachers; while the males in credit management have interests similar to funeral directors, buyers, hotel managers, and travel bureau managers.

Other scales withe female-male differences in coding are 1) Guidance Counselor, coded Social-Conventional-Enterprising for men, with interests similar to school superintendents and public administrators, and coded Social-Enterprising-Conventional for women, who have interests similar to social science teachers and personnel directors.

2) Accountants, coded Conventional for females, with interests similar to bookkeepers, bank cashiers, and secretaries, and coded Conventional-Enterprising for males, who have interests similar to bankers and department store salespersons, and

3) Life insurance agents, coded Enterprising-Social for men, with interests similar to sales managers, chamber of commerce executives, and public relations directors, and coded Enterprising for women, who have interests similar to lawyers, politicians, and retailers.

I would like to turn to an example of the integration of the General Theme Scales with the Basic Interest and Occupational Scales. Table 7 presents General Occupational Theme scale scores for a subject tested on the SCII. This particular individual scored Very High on two Theme Scales, Investigative and Realistic. These scores suggest that the individual will also have high scores on the Basic Interest Scales, Science, Mathematics, Medical service and Medical science which all fall into the Investigative cluster of Basic Interest Scales, and also, will have high scores on the Realistic Basic Interest Scales, Mechanical activities, Military activities, Adventure, Nature, and Agriculture.

Identifying this individual as an Investigative-Realistic type on the basis of the high Theme scores, and then locating occupations with Investigative-Realistic codes and Investigative codes, suggests areas for

occupational interest exploration such as engineering, chemistry, medical technology, pharmacy, dentistry, mathematics, physics, veterinary medicine, optometry and medicine -- a range of occupations in the medical and science professions. The IR combination also suggests a high academic orientation score.

These are hypothesized Basic and Occupational Interests based on the two Very High Theme Scores -- Investigative and Realistic.

Table 8 presents the actual Basic Interest scores for this individual. Highest scores were activities included in the investigative cluster, and all of the Realistic Basic Interests except those emphasizing outdoor and agriculture interests. The only high Basic Interest score that was not predicted from the Theme scale scores was Writing.

The high scores on the Basic Interest Scales, like the high scores on the General Occupational Theme Scales, suggest medical and science professions as possible occupational areas for vocational exploration.

The highest actual scores for this individual on the male and female normed scales for several occupations are presented in Table 9.

I have purposely avoided identifying the sex of the subject; careful examination of the standard scores and the occupational codes should show that the subject is female. On every scale the subject received a higher score for the gender-congruent scale than for the non-congruent gender scale; also, the female Holland codes for each occupation are consistent; in all but one instance, the occupations were coded Investigative-Realistic or Investigative, whereas the male scales do not present the same profile consistency for this female subject.

This demonstrates the difficulties of interpreting male or female normed scales for the other sex. Although an individual has the option of being scored on all SCII scales, whether female or male normed, and although that information may be interesting, to see how similar ones interests are to those of the other sex, the most technically accurate way to interpret empirical scale scores is to concentrate on those for the appropriate sex.

Table 1

Data Used to Classify Occupations:

General Theme Scale Means

Scale	Sex	General Occupational Theme Means for Occupational Sample R	I	A	S	E	C	Holland Code
Artist	F	44	49	57	42	42	40	A
	M	48	52	58	43	42	39	A

Table 2

Data Used to Classify Occupations:

General Theme Scale Means

Scale	Sex	General Occupational Theme Means for Occupational Sample R	I	A	S	E	C	Holland Code
Mathematician	F	49	58	48	43	40	48	I
	M	50	58	50	45	43	47	I

Table 3

Data Used to Classify Occupations:

General Theme Scale Means

Scale	Sex	General Occupational Theme Means for Occupational Sample R	I	A	S	E	C	Holland Code
Dentist	F	55	57	49	46	45	51	IR
	M	54	56	48	51	50	50	IR

Table 4

Data Used to Classify Occupations:

General Theme Scale Means and Correlations

Scale	Sex	General Occupational Theme Means For Occupational Sample R	I	A	S	E	C	Holland Code
Medical Technologist	F	57	60	48	48	45	51	IR
	M	55	59	47	54	51	54	IRC

		Correlations Between Theme Scales and Occupational Scales (Based on 200 males) R	I	A	S	E	C
	M	54	79	21	30	10	48

Table 5

Data Used to Classify Occupations:

General Theme Scale Means

Scale	Sex	General Occupational Theme Means For Occupational Sample R	I	A	S	E	C	Holland Code
Nurse, R.N.	M	56	54	48	51	50	49	RI
	F	51	53	49	54	49	48	SI

Table 6

Data Used to Classify Occupations:

General Theme Scale Means and Correlations

Scale	Sex	General Occupational Theme Means For Occupational Sample R	I	A	S	E	C	Holland Code
Credit Manager	M	51	51	48	53	58	58	ECS
	F	45	45	49	50	55	61	CE

Correlations Between Theme Scales and Occupational Scales

	R	I	A	S	E	C
(Based on 201 females)						
F	-01	-22	-44	17	62	73
(Based on 200 males)						
M	25	20	02	54	83	75

Table 7

Strong-Campbell Interest Inventory Profile

General Occupational Theme	Standard Score	Result
R-THEME	63	This is a VERY HIGH Score
I-THEME	67	This is a VERY HIGH Score
A-THEME	57	This is an AVERAGE Score
S-THEME	50	This is an AVERAGE Score
E-THEME	48	This is an AVERAGE Score
C-THEME	52	This is an AVERAGE Score

Suggests: Basic Interests

Science
Mathematics
Medical Science
Medical Service

Mechanical
Military Activities
Adventure
Nature
Agriculture

Suggests: Occupations

IR { Engineer, Chemist, Medical Technologist, Pharmacist, Dentist } { Mathematician, Physicist, Veterinarian, Optometrist, Physician } I

Suggests: ACADEMIC ORIENTATION: HIGH

Table 8

Strong-Campbell Interest Inventory Profile

	Basic Interest Scale	Standard Score	Result
I-THEME	Science	64	This is a HIGH Score
	Mathematics	61	This is a HIGH Score
	Medical Science	66	This is a VERY HIGH Score
	Medical Service	59	This is a HIGH Score
R-THEME	Mechanical	65	This is a VERY HIGH Score
	Military Activities	62	This is a HIGH Score
	Adventure	59	This is a HIGH Score
	Nature	51	This is an AVERAGE Score
	Agriculture	49	This is an AVERAGE Score
A-THEME	Writing	60	This is a HIGH Score

Suggests: IR Medical Professions
IR Science Professions
I Medical Professions
I Science Professions

Suggests: HIGH ACADEMIC ORIENTATION

Table 9

Subject: Female

Strong-Campbell Interest Inventory Profile

Occupation	Standard Score		Holland Code	
	Female	Male	Female	Male
Medical Technologist	59	48	IR	IRC
Engineer	58	51	IR	IR
Physician	58	50	I	IRS
Chemist	56	36(Phy Sci)	IR	IR(Phy Sci)
Dentist	55	51	IR	IR
Physicist	54	36(Phy Sci)	I	IR(Phy Sci)
Optometrist	54	45	I	IRC
Pharmacist	52	33	IR	EIC
Veterinarian	52	38	I	RI
Dietitian	56	42	IC	REC
Mathematician	41	28	I	I

ACADEMIC ORIENTATION: 69 This is a VERY HIGH score