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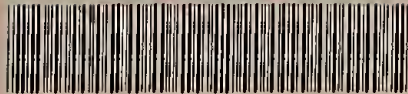
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RELIABILITY OF THE MINNESOTA VOCATIONAL INTEREST INVENTORY
WITH HOSPITALIZED MENTAL PATIENTS

A Thesis Presented

By

Dennis William Olson

Submitted to the Graduate School of the
University of Massachusetts in
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During the past 20 years interest inventories have established themselves as reliable and useful instruments in vocational counseling. E. F. Strong, Jr., and Frederick Luder have been primarily responsible for the efforts in this area. Their respective instruments have been the most widely used and researched (Super and Crites, 1962).

The Strong Vocational Interest Blank (SVIB), however, is intended for use only with persons at the semi-professional and professional vocational levels. The Fisher Preference Record-Vocational (1946-V), although useful at both professional and nonprofessional levels, was not constructed on an empirical basis. The recent publication of the Minnesota Vocational Interest Inventory (1911) authored by Clark and Campbell (1965), was the first significant effort to provide an empirically derived interest inventory useful with persons at nonprofessional vocational levels.

The present SVI is the culmination of nearly 20 years of research begun by Clark in 1946-47. Although originally developed for the counseling and assignment of Navy enlisted men, the first form also contained items related to a number of civilian occupations. These items, with other new ones, have since been used in the construction of the present inventory for persons seeking work at the skilled trades and technical level of employment.

The SVII consists of 476 items arranged in a forced choice format consisting of 138 triads from each of which the testee chooses the activity which he "most likes" and the activity he "most dislikes". Answers are recorded on one of two general forms: a booklet form with questions followed immediately by spaces for answers, or a separate form to be used with reusable booklets.

Scores are reported on a profile sheet listing 21 specific occupational scales and 9 homogeneous or area scales relating to broader interest areas. The 21 occupational scales include Baker, Food Service Manager, Milk Wagon Driver, Retail Sales Clerk, Stock Clerk, Printer, Tabulating Machine Operator, Warehouseman, Hospital Attendant, Fireman, Carpenter, Painter, Glasser, Truck Driver, Truck Mechanic, Industrial Education Teacher, Sheet Metal Worker, Plumber, Machinist, Electrician, and Radio-T. V. Repairman. The 9 area scales include Mechanical, Health Service, Office Work, Electronics, Food Service, Carpentry, Sales-Office, "Clean Hands", and Outdoors.

The occupational scales were constructed on a basis similar to that on which the scales of the SVII were determined. Interest patterns common to persons in particular occupations but unlike those of Tradesman-in-General (TIG) were selected for each of the 21 scales. As on the SVII, scores were standardized so that the mean score for any occupational group on their own scale was 50 with a standard deviation of 10. A score of 45 or higher thus reflects interests in common with the upper 69 percent of men in that occupation.

Items scored on any of the 9 area scales were selected on the basis of item intercorrelations. This procedure is similar to the manner in

which items were selected for the KTG-F. A description of the content of the army scales may be found in Appendix A.

The majority of the criterion groups used in the construction of the WII occupational scales consisted of members of labor unions in the St. Paul - Minneapolis area. Three scales, Food Service Manager, Hospital Attendant, and Radio-T. V. Repairman, were determined on the basis of scores of men passing through Naval Receiving Stations in 1951 who held ratings of Commissaryman, Hospital Corporal, or Electronic Technician, respectively. Four other scales, Retail Sales Clerk, Tabulating Machine Operator, Truck Mechanic, and Industrial Education Teacher, were determined from the scores of various groups of men engaged in those occupations. The criterion groups ranged in size from 72 to 519, with two groups over 300 and three groups under 100. Eight of the 21 scales have been cross-validated. The Tradesman-In-General group was composed of 240 workers from 16 civilian occupations at the skilled trades level with no group contributing more than 10 percent of the total number of workers.

Information concerning the validity of the WII has been reported by Clark in terms of the percentage of overlap of the scores of the men in a certain occupation and the scores of TII. The highest percentage of overlap was 63 percent (Stock Clerk); the median percentage was 40 percent. Estimated point-biserial r 's comparable to the percentages of overlap ranged from .40 to .80.

In classifying testees into groups, the percent of classification errors may be expected to be roughly half of the percentage of overlap. With a percentage overlap of 40, a scale could misclassify about 20

percent of the total group. With 100 percent overlap, likelihood of correctly classifying persons by scores on that scale would be chance.

Because of its recent publication date, research on the NWII other than that of its authors is limited. The few studies currently available have found the NWII to be a reasonable valid instrument in counseling trade and technical school students (Forsley, 1956), vocational high school students (Carnotte and McCall, 1964), and hospitalized veterans (Hollman, 1961).

Scott (1960) contributed to the construct validity of the NWII by comparing scores on it with SVI scores. He also studied the influence of age, intelligence, work experience, and work preferences on NWII scores.

Although the inventory has been fairly well studied, examples of reliability are notably lacking. Clark has indicated that primary attention was given to establishing maximum validity for the keys to the NWII (Clark, 1964). The only reliability study reported was a test-retest study with a thirty day interval conducted at Furmody Industrial Institute in Minneapolis (Clark and Campbell, 1965).

It seems particularly important to determine the reliability of interest measures in that interests may be elusive or transitory. If interests are readily changeable, then attempts to help a person choose what may well be a life long vocation on the basis of immediate interests would hardly be justified. If, on the other hand, interests can be shown to be stable and basic aspect of one's personality, as strong found in follow up studies as much as twenty years later

(Strong, 1955), then an instrument which reliably reports individual interest patterns would be extremely useful in helping persons choose vocational fields matching their interests.

In the Juncoody study, Clark found median correlations for the MVII scales of .82 and .83 for the occupational and area scales respectively. The range for the occupational scales was from .64 for the Insurance scale to .88 for the Retail Sales Clerk scale. The highest reliability for an area scale was .87 on the Mechanical scale; the "Clean Hands" scale with a correlation of .62 was lowest.

The students at Juncoody, however, represent a select group with above average intellectual ability (Bradley, 1956). Test results with this group may not be typical of results obtained with other groups (e.g. hospitalized psychiatric patients) with whom it might be desirable to use the MVII.

Comparable studies with the SVIB yielded median scale test-retest reliabilities of .91 over both 2 week and 30 day intervals (Strong and Campbell, 1946). Other extended studies by Strong over periods of 3, 8, 22, and 30 years found median correlations from .66 to .96.

It was the purpose of this study to examine the reliability of the MVII when used with hospitalized veterans. Three specific purposes were: 1) to determine the test-retest reliability of each scale, 2) to determine the test-retest reliabilities for individuals on both their occupational and area profiles, and 3) to evaluate the significance of various factors related to profile stability.

Subjects

Subjects consisted of 97 open ward patients at the Northampton, Massachusetts, Veterans Administration Hospital. In order to select men who were potential candidates for the later work, subjects were required to be between the ages of 20 and 55 and to have had at least an 8th grade education.

Testing Procedure

Subjects were tested on a volunteer basis. Men were asked to report to a testing location and were informed each time before taking the inventory that the services of those who cooperated would be appreciated, but that they were free to leave at any time they desired. It was felt in this case that a volunteer arrangement would more closely simulate the counseling situation for which the WII is intended. Of 150 men tested, 97 completed test and retest. Twenty-six completed the inventory the first time, but refused to take it a second time. Four completed it the first time, but made mistakes on the retest. Twenty-three could not follow the directions and did not complete the inventory a first time.

A 13 - 15 day test-retest interval was used. A longer time period could not be used as the average length of time in the hospital for new patients is only 30 days. When administered in a group setting there was on the average a ratio of one projector for every 5 - 6 men. In order to minimize the length of instructions and the likelihood of making errors, the booklet form of the WII was used.

Predictor Variables

Scores on various factors which might be correlated with test-retest stability or instability were obtained for each subject. In order to obtain a rough measure of intelligence, the vocabulary half of the Shipley Institute of Living Scale (See Appendix B) was given to all subjects at the time of the first testing.

A biographical information blank (See Appendix C) was given at the time of the retest which provided information concerning age, marital status, amount of education, past occupation, preferred occupation, and use of medication for each subject. "Past occupation" was the most recent job which the subject had held prior to hospitalization. "Preferred occupation" was determined by asking the subjects what occupation they would prefer to enter upon leaving the hospital.

Past and preferred occupation were classified according to occupational level using a modification of Roe's occupational classification by Roe, Rubin, and Shulsky, (1956). The 9 areas of the NWII were used to classify the subject's past and preferred occupation into occupational fields. The past and preferred occupational fields were then compared with the measured fields of interests as indicated on the NWII area profiles. If the subject's past (or preferred) occupation was high (≥ 60) on the most relevant NWII area scale, the two indexes of vocational interests were said to be in "Agreement". If they scored low (≤ 40) on the most relevant NWII area scale, "Disagreement" was noted. If the score on the NWII profile was between 40 - 60, the relationship was judged "Indeterminant".

Additional information was obtained from hospital records

concerning each subject's level of activity in therapy program, diagnosis, most recent date of admission, number of admissions, and use of the vocational counseling service. Subjects were classified according to level of activity in therapy program depending on whether they were involved in no program at all, in a low pay, low responsibility regular program, in a higher paying, higher responsibility incentive program, or in work outside of the hospital. "Use of the vocational counseling service" applied to those who had actively sought counseling, or placement aid from this service within the past three months.

During the course of the testing a noticeable reluctance on the part of the men toward taking the inventory a second time made it desirable to ask additional questions of them. An opinion questionnaire (See Appendix D) was given to the last 39 subjects after their second testing in an attempt to determine if their attitude was generally positive or negative toward the testing. Subjects were asked to indicate whether they felt the "results obtained from this test could be personally helpful to me," whether the test was "easy for me to take", whether they thought the test was "boring," and whether they "resented taking this test two times." The possible answers, strongly agree, agree, uncertain, disagree, strongly disagree, were scored on a five point scale with 5 indicating an answer judged highly positive toward the testing situation and 1 indicating a highly negative answer.

In an effort to measure the personal involvement of the subjects in the testing, the last 43 men were asked to indicate on their

information about whether or not they would like to see their results and discuss them with a psychologist.

Additional variables which were included as possible correlates of stability were a measure of the range of the scores on a subject's profile, whether or not the subject had been discharged within three months after testing, and whether or not the subject was tested under group or individual conditions. The measure of the range of a subject's profile was the sum of his occupational scale scores equal to or below 20 and those equal to or above 45.

Finally, it was considered of interest to examine the correlation between the subject's test-retest consistency and his first, second, and average scores on the Verification Scale of the WVI (Campbell and Truckman, 1967).

Analysis

Test-retest reliabilities for each of the 21 occupational and the 9 area scales were separately determined by means of a Pearson product-moment correlation coefficient (U technique, Cattell, 1952).

Test-retest reliabilities for each of the 37 subjects were separately determined for both their Occupational and area profiles using a Pearson product-moment correlation coefficient (U technique, Cattell, 1952). Subject test-retest reliabilities were also determined by means of the formula for the generalized distance function. Both \bar{D} and \bar{D}^2 (Gronbach and Gleser, 1953) were used.

The subject test-retest reliability scores were correlated with each of the various predictor variables. For computational purposes variables were coded when necessary such that the aspect of the

variable hypothesized to contribute to interest stability was assigned the numerically higher value (see Table 4).

Where computing correlations based on other correlations, Fisher's r to z transformation was used (Johnson, 1962). In cases where the data were dichotomized, a point biserial correlation was used.

RESULTS

As shown in Table 1, test-retest reliabilities for the occupational scales ranged from .55 for "Carpenter" to .71 for "Retail Sales Clerk". The median reliability was .83.

Mean scale scores on both test and retest were highest for the food oriented scales of Baker and Food Service Manager and the "white collar, clerical" group containing the Milk Wagon Driver, Retail Sales Clerk, Stock Clerk, Printer and Tabulating Machine Operator scales. These scores ranged from approximately 10 to 15 points above those reported by Clark (1961). Mean scores on the scales from Hospital Attendant to Plasterer were very nearly the same, but scores on the "blue collar, mechanical" scales beginning with Truck Mechanic were from about 10 to nearly 20 points below those reported by Clark.

Four mean scale scores (Baker, Milk Wagon Driver, Stock Clerk, and Warehouseman) were above 45 which normally indicates a high similarity of interest with men in that occupation. Four test (Electrician, Plumber, Industrial Education Teacher, and Truck Mechanic) and five retest (the same four plus Pressman) mean scale scores were below 25 which normally indicates marked dissimilarity of interests with men in that occupation.

The homogeneous scales had reliabilities ranging from .65 to .71 with a median of .64 (Table 1).

Mean scores for the Mechanical scale, and for the Outdoors scale on the retest, were below 40 indicating a general lack of interest in activities related to these areas.

Table 1

Test-Retest Reliability for Occupational and
Homogeneous Scales over a Two Week Interval

(N = 97)

Occupational Scale	r	Test		Retest	
		Mean	S.D.	Mean	S.D.
1) Baker	.85	48.4	7.5	47.9	9.9
2) Food Service Manager	.84	42.7	8.4	43.0	6.7
3) Milk Wagon Driver	.90	45.3	11.2	45.5	11.4
4) Retail Sales Clerk	.93	43.6	9.6	44.5	9.9
5) Stock Clerk	.83	59.7	8.9	54.7	9.0
6) Printer	.88	42.4	9.4	43.0	9.7
7) Tabulating Machine Operator	.88	40.0	9.6	40.4	10.0
8) Warehouseman	.76	45.2	10.2	45.6	10.0
9) Hospital Attendant	.83	39.2	6.4	39.3	7.3
10) Pressman	.65	25.8	11.3	24.9	12.6
11) Carpenter	.55	34.1	11.2	33.7	11.1
12) Painter	.73	31.6	11.3	33.7	11.7
13) Plasterer	.71	29.4	11.2	29.3	10.8
14) Truck Driver	.73	26.3	9.8	26.4	10.4
15) Truck Mechanic	.91	20.3	13.0	20.6	14.7
16) Industrial Education Teacher	.73	12.0	10.7	12.6	12.3
17) Sheet Metal Worker	.85	26.5	10.2	25.2	10.9
18) Plumber	.74	20.9	11.7	20.4	11.6
19) Machinist	.82	27.9	9.2	26.9	10.0
20) Electrician	.85	15.7	12.2	15.3	13.0
21) Radio - T. V. Repairman	.85	28.8	10.5	29.5	10.7
<hr/>					
Homogeneous Scale					
H-1) Mechanical	.91	37.7	10.1	37.3	10.6
H-2) Health Service	.83	54.6	10.0	55.0	10.8
H-3) Office Work	.87	58.6	12.6	59.6	14.1
H-4) Electronics	.84	43.1	9.5	42.9	10.2
H-5) Food Service	.66	57.8	12.0	58.4	12.9
H-6) Carpentry	.83	45.0	11.2	45.2	11.0
H-7) Sales - Office	.88	58.7	10.7	59.5	11.7
H-8) "Clean Hands"	.66	59.9	11.6	59.5	11.6
H-9) Outdoors	.65	40.0	9.9	39.3	9.3

Test-retest reliabilities for individual Occupational profiles ranged from .50 to .97 with a median of .91. As shown in Table 2, 53 of the 97 men had correlations equal to or greater than .90. All correlations were above .50 and significant at the .05 level.

The range of D^2 was from 190 to 3144 with a median of 75. D varied from 13.78 to 56.07 with a median of 29.92.

Correlations between individuals' Area profiles ranged from .05 to .99, with a median of .90. With 7 degrees of freedom a correlation equal to or greater than .67 is required for statistical significance at the .05 level. Twelve of the 97 correlations between Area profiles were not statistically significant.

For the Area profiles, D^2 ranged from 51 to 2009, with a median of 353. The range of D extended from 7.14 to 44.82, with a median of 18.79.

As shown in Table 3A, there was a .99 correlation between D and D^2 for the Occupational profiles. D and D^2 correlated $-.80$ and $-.75$ respectively with the Pearson product-moment correlations transformed to z using Fisher's r to z transformation. As D and D^2 increase with increasing dissimilarity they would be expected to be inversely related to r which decreases as dissimilarity becomes greater. As measures of dissimilarity between Area profiles, D and D^2 were correlated with each other .97, and with z $-.68$ and $-.62$ respectively.

The mean values of the predictor variables, as shown in Table 5, indicate that the average subject was about 42 years old, single, had completed about 11½ years of school, and in the past had been employed at the semi-skilled level. He has not recently been discharged from

Table 2

Distribution of Profile Correlations

<u>Correlation</u>	<u>Frequencies</u>	
	<u>Occupational Profile</u> (N = 21)	<u>Area Profile</u> (N = 9)
.90 - .99	53	50
.80 - .89	23	21
.70 - .79	13	10
.60 - .69	5	10
≤ .59	3	6
Median	.91	.90

Table 3

Intercorrelations Between Measures
of Profile SimilarityA. Occupational
Scales

	α	β	β^2
α		-.80	-.75
β			.99
β^2			

B. Non
Scales

	α	β	β^2
α		-.68	-.62
β			.97
β^2			

the hospital, he has been admitted at least two times, but not likely within the past year. He is active in a regular or incentive program, aspires to a higher level of work than he has previously held, but has not recently sought the aid of the vocational counseling service. He is a psychotic and under medication.

Mean scores on the questions of the opinion questionnaire indicate that the majority of men felt the inventory could benefit them, that it was easy to take, was not boring, and was not a bother to take a second time. Most of those asked requested their results.

Most of the men were tested in a group. Only 20 percent were tested individually.

The typical profile had a total of nine extreme Occupational scale scores, that is, scores equal to or greater than 45 and/or equal to or less than 20.

The average score on the VII Verification scale was between 16 and 17. This was noticeably higher than the mean score of 11.38 for a similar group of hospitalized psychotics reported in Campbell and Trockman (1963).

Variations in N for the predictor variables was due either to missing information in hospital records, failure of the subject to complete in full his biographical information sheet, or the initiation of new variables after testing had been completed with some subjects. In the case of "intelligence", the test was incorrectly administered to a number of subjects thus invalidating their scores.

The 27 coded factors chosen as possible correlates of profile stability (See Table 6), education (.01), intelligence (.01), field

Table 4
Variable Codes*

<u>Variable</u>	<u>Coded Number</u>	<u>Description</u>
Marital status	0	Single, divorced, separated widowed
	1	Married
Use of drugs	0	Receiving drugs
	1	Not receiving drugs
Occupational level	0	Unskilled
	1	Semi-skilled
(Also, level of occupational choice)	2	Skilled
	3	Semiprofessional and managerial
	4	Professional and managerial
Occupational field	0	Disagreement with WWII profile
(Also, field of occupational choice)	1	Indeterminant
	2	Agreement with WWII profile
Activity level in therapy programs	0	Not participating in any program
	1	Regular program
	2	Incentive program
	3	Working outside of hospital
Use of vocational counseling service during past year	0	No
	1	Yes
Diagnosis	0	Psychotic
	1	Neurotic
Date of last admission	0	Not within one year of testing date
	1	Within one year
Test conditions	0	Tested in group
	1	Tested alone
Active - Discharged	0	Active status
	1	Discharged within 3 months after testing
Test results requested	0	No
	1	Yes
Vocational preference	0	None given
	1	Preference stated

*These variables were coded as shown for computational purposes.

Table 5
Means and Standard Deviations
for Predictor Variables

Predictor Variables	N	Mean	S D
1. Age	97	41.92	8.69
2. Marital status*	97	.23	.42
3. Education	94	11.66	2.42
4. Intelligence	79	27.73	5.80
5. Drugs*	97	.04	.20
6. Occupational level*	96	1.19	.93
7. Occupational field*	71	1.15	.75
8. Level occupational choice*	53	1.47	.97
9. Field occupational choice*	45	1.24	.71
10. Activity level - therapy programs*	96	1.54	1.05
11. Use of vocational counseling service*	97	.41	.49
12. Diagnosis*	89	.12	.33
13. Date of last admission*	97	.45	.50
14. Number of admissions	95	2.31	1.64
15. Opinion #1	39	3.72	1.05
16. Opinion #2	39	3.63	1.10
17. Opinion #3	39	3.29	1.39
18. Opinion #4	39	2.97	1.46
19. Sum of attitudes toward test taking	39	13.68	3.50
20. Test conditions*	97	.20	.40
21. Active or discharged*	97	.16	.37
22. Test results requested*	43	.72	.45
23. Measure of range of profile	97	9.22	4.16
24. Vocational preference*	80	.69	.47
25. V-score, 1st testing	97	16.16	3.51
26. V-score, 2nd testing	97	16.92	3.26
27. Average V-score	97	16.54	2.78

*Coded variable, See Table 4

of occupational choice (.01), active or discharged status (.05), and range of profile (.01) were significantly correlated with stability of the Occupational profile. All of these variables except "active or discharged status" were also significantly correlated with D and D^2 at either the .01 or .05 level (See Table 6).

Education (.05), intelligence (.01), field of occupational choice (.01), opinion #3 ("I thought this test was boring.") (.05), and range of profile (.01) were significantly correlated with stability of the Area profiles. Education and range of profile were not significantly correlated with Area profile stability as measured by D or D^2 , and opinion #3 was not significantly correlated with D^2 . (See Table 7)

Table 6

Correlations Between Measures of Profile Similarity
for Occupational Scales and Predictor Variables

Predictor Variables	N	r	D	D ²
1. Age	97	.13	-.04	-.03
2. Marital status	97	-.18	.26	.15
3. Education	94	.28**	-.25*	-.37**
4. Intelligence	79	.32**	-.38**	-.37**
5. Drugs	97	.04	-.10	-.10
6. Occupational level	90	.08	-.15	-.17
7. Occupational field	71	.22	-.21	-.19
8. Level occupational choice	53	-.01	.00	.00
9. Field occupational choice	45	.50**	-.38**	-.38**
10. Activity level - therapy programs	96	-.09	.01	.01
11. Use of vocational counseling service	97	-.08	.03	.01
12. Diagnosis	69	.13	-.14	-.15
13. Date of last admission	97	.03	-.10	-.11
14. Number of admissions	95	.06	-.05	-.07
15. Opinion #1	39	-.03	.00	.00
16. Opinion #2	39	-.19	.13	.13
17. Opinion #3	39	.04	-.09	-.12
18. Opinion #4	39	.08	-.06	-.09
19. Sum of attitudes toward test taking	39	-.03	-.01	-.04
20. Test conditions	97	-.09	.03	.00
21. Active or discharged	97	.21*	-.27	-.17
22. Test results requested	43	.16	-.20	-.18
23. Measure of range of profile	97	.66**	-.23*	-.21*
24. Vocational preference	80	.11	-.18	-.16
25. V-score, 1st testing	97	.11	-.12	-.13
26. V-score, 2nd testing	97	-.02	.10	.09
27. Average V-score	97	.04	.00	-.01

* P - .05

** P - .01

Table 7

Correlations between Measures of Profile Similarity
for Area Scales and Predictor Variables

Predictor Variables	N	r	r	r ²
1. Age	97	.11	.02	.04
2. Marital status	97	-.06	-.04	-.06
3. Education	94	.24*	-.20	-.10
4. Intelligence	79	.33**	-.24*	-.23*
5. Drugs	97	.02	-.16	-.14
6. Occupational level	98	.06	-.19	-.21
7. Occupational field	71	.20	-.14	-.13
8. Level occupational choice	53	-.01	-.14	-.12
9. Field occupational choice	45	.51**	-.41**	-.41**
10. Activity level - therapy programs	96	-.15	.03	-.01
11. Use of vocational counseling service	97	-.17	.10	.06
12. Diagnosis	89	.34	-.24	-.12
13. Date of last admission	97	-.17	.15	.11
14. Number of admissions	95	.00	-.01	-.04
15. Opinion #1	39	-.03	-.08	-.13
16. Opinion #2	39	.06	-.06	.00
17. Opinion #3	39	.33*	-.34*	-.29
18. Opinion #4	39	.29	-.16	-.16
19. Sum of attitudes toward test taking	39	.27	-.26	-.23
20. Test conditions	97	-.13	.06	.04
21. Active or discharged	97	.16	-.01	.00
22. Test results requested	43	.11	.06	.07
23. Measure of range of profile	97	.44**	-.01	-.02
24. Vocational preference	80	-.04	.06	.09
25. V-score, 1st testing	97	.03	-.06	.06
26. V-score, 2nd testing	97	-.01	-.10	.06
27. Average V-score	97	.02	-.10	.11

*p = .05

**p = .01

DISCUSSION

Scale reliabilities compare closely with those found by Clark (1961) with students at Denison Industrial Institute. In Clark's study, with a 30 day interval between testings, median correlations of .82 and .83 were obtained for the Occupational and Area scales respectively. The median correlations of .89 (Occupational scales) and .84 (Area scales) obtained in this study with a 2 week interval compare favorably with Clark's results. It is doubtful that the difference in the intervals was important. In similar studies with the SVII, the authors of the test manual (Strong and Campbell, 1966) found no difference ($r = .91$) between median test-retest scale scores over 2 week and 30 day intervals.

The apparent difference in scale reliability between the SVII and the SVIS may be due in part to a greater differentiation of professional and business interests than of interests at the skilled trades and technical level. The greater the differentiation the less likely a subject will achieve a particular scale score by chance. Whatever the reason, the SVII does differentiate better as indicated by a median percentage of overlap between scales and non-is-general of 31 percent as compared to 40 percent on the SVII. This should contribute to the higher scale reliabilities found for the SVIS.

The "class lines" profile characteristic of this group of subjects (see Figure 1) may be indicative of their pathology. This apparent aversive and negative orientation toward work was also found by Sullivan (1961), working with a similar group of hospitalized mental patients.

Figure 1
Group Profile (N = 97)

23

NAME _____ AGE _____ SEX _____ DATE _____

MINNESOTA VOCATIONAL INTEREST INVENTORY

OCCUPATIONAL SCALES	STD. SCORE ^a	0	10	20	30	40	50	60
BAKER	48	.....	.....	.....	.....	.....	.....	.....
FOOD SERVICE MANAGER	43	.....	.....	.....	.....	.....	.....	.....
MILK WAGON DRIVER	45	.....	.....	.....	.....	.....	.....	.....
RETAIL SALES CLERK	44	.....	.....	.....	.....	.....	.....	.....
STOCK CLERK	54	.....	.....	.....	.....	.....	.....	.....
PRINTER	42	.....	.....	.....	.....	.....	.....	.....
TAB. MACHINE OPERATOR	40	.....	.....	.....	.....	.....	.....	.....
WAREHOUSEMAN	45	.....	.....	.....	.....	.....	.....	.....
HOSPITAL ATTENDANT	39	.....	.....	.....	.....	.....	.....	.....
PRESSMAN	26	.....	.....	.....	.....	.....	.....	.....
CARPENTER	34	.....	.....	.....	.....	.....	.....	.....
PAINTER	34	.....	.....	.....	.....	.....	.....	.....
PLASTERER	29	.....	.....	.....	.....	.....	.....	.....
TRUCK DRIVER	26	.....	.....	.....	.....	.....	.....	.....
TRUCK MECHANIC	20	.....	.....	.....	.....	.....	.....	.....
INDUSTRIAL EDUC. TEACHER	12	.....	.....	.....	.....	.....	.....	.....
SHEET METAL WORKER	27	.....	.....	.....	.....	.....	.....	.....
PLUMBER	21	.....	.....	.....	.....	.....	.....	.....
MACHINIST	28	.....	.....	.....	.....	.....	.....	.....
ELECTRICIAN	16	.....	.....	.....	.....	.....	.....	.....
RADIO-TV REPAIRMAN	29	.....	.....	.....	.....	.....	.....	.....
	
	
	
	

^a SCORES ABOVE 60 ARE PLOTTED AS 60.
NEGATIVE SCORES ARE PLOTTED AS ZERO.

AREA SCALES	STD. SCORE	20	30	40	50	60	70	80
H-1 MECHANICAL	38	.....	.....	.....	.....	.....	.....	.....
H-2 HEALTH SERVICE	55	.....	.....	.....	.....	.....	.....	.....
H-3 OFFICE WORK	59	.....	.....	.....	.....	.....	.....	.....
H-4 ELECTRONICS	43	.....	.....	.....	.....	.....	.....	.....
H-5 FOOD SERVICE	58	.....	.....	.....	.....	.....	.....	.....
H-6 CARPENTRY	45	.....	.....	.....	.....	.....	.....	.....
H-7 SALES-OFFICE	59	.....	.....	.....	.....	.....	.....	.....
H-8 "CLEAN HANDS"	60	.....	.....	.....	.....	.....	.....	.....
H-9 OUTDOORS	40	.....	.....	.....	.....	.....	.....	.....

SEE OTHER SIDE FOR EXPLANATION

Figure 1. Profile Sheet (Front)

It seems plausible that the subjects were not so much choosing in a positive sense the same things that a Stock Clerk, for instance, might choose, but rather were avoiding certain activities which in the forced choice format has the effect of causing them to choose items normally chosen by stock clerks. Thus, to the extent subjects reject items listing "dirty hands" or "blue collar, mechanical" work, they are likely to be choosing activities related to the "clean hands" scales, but not necessarily out of a genuine interest in these activities. They may be choosing the most passive activities or those which require the least commitment in terms of time or energy.

The high scores of these subjects on the Verification Scale, which has been shown to be more a masculinity-femininity scale than a measure of random or careless answering (McCall, 1965), lends support to the idea of feminine or more passive work interests being common to this type of population.

This trend warrants the use of caution in interpreting high scores on the "clean hands" or "white-collar, clerical" scales with subjects of this type. On the other scales, however, high scores are likely to carry the same implications that they would with a normal population. That diagnostic properties might be derived for various profile patterns seems likely in view of these findings. Further research in that direction might well be undertaken.

The stability of the profiles in this study supports the use of the MWII with hospitalized mental patients, at least, as an instrument yielding consistent results. Questions concerning the validity of the MWII with a population of this type require additional research,

especially with respect to the meanings of the "clay handle" profiles found to be typical of this group. It could even be at this point that some of the scales are not measuring the characteristics for which they were intended. If a general factor of some sort is affecting these scores it is likely that the measure of validity employed by Clark, percentage of overlap between scales, would be effected.

Further research on the validity of the VII for hospitalized mental patients is needed before the instrument can really be deemed useful with such a population. A follow-up on the subjects in this study might be undertaken to explore the validity of the VII as well as the interrelationships between reliability, validity, and certain variables peculiar to this type group. For instance, it would be possible to determine the influence of profile stability on predictive validity.

The correlates of stability examined in this study provide some indices of stability which should be of help to the counselor. The range of a subject's profile, and the extent of agreement between a subject's field of occupational choice and his test profile are both readily determined in the counseling situation without extensive calculations.

The "range of profile" seems to indicate that the more extreme interests a subject has, the less likely that these interests will later undergo major changes in their positions relative to each other. In contrast, with a flat profile it is easy for large rank order changes to result from small changes in scale scores.

In a counseling situation, the higher the score, the more

confidence the counselor could have in the reliability of the one profile he would have at his disposal. Hoyt (1960) found that when r was equal to or greater than .75 as an index of NWIB profile stability, counseling interpretations were essentially unchanged. As a conservative estimate in this study, if r is equal to or larger than .85 counseling interpretations would probably be about the same. As shown in Table 8, 69 percent of those subjects with a range of profile score equal to or greater than 9 (the group mean) had correlations of stability equal to or greater than .85. Only 11 percent of those with scores at or above 9 had correlations below .85. For the group as a whole, 30 percent had occupational profiles with r less than .85.

The comparison of field of occupational choice and most relevant area scale is also quick and easy to use as an index of stability. Unlike the measure of the range of a profile, however, it is not available in every situation. As found in this study, some occupations are not readily classified into one of the 9 NWIB area scales, for example, mathematics teacher, janitor, or general laborer.

This index suggests that a person's profile is likely to be more reliable if his expressed choice of occupation is in agreement with his measured interests. A parallel finding was noted by Traphagen (1952) when he investigated the relationship of occupational preference and NWIB scores. He concluded that when expressed and measured interests were in disagreement the preferences were likely to change in direction of the measured interests. Super and Grits (1962) note, however, that this study was probably contaminated in

Table 8

(N = 97)

Expectancy Table Showing the Probability of Having a Reliable
 XVII Occupational or Area Profile Given an Above or Below
 Average Score on Range of Profile

Range of Profile	Percentage of Subjects with Profile Reliability					
	< .85		≥ .85		Total	
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
≥ 9 Occupational Scales	6	11%	49	89%	55	100%
Area Scales	12	22%	43	78%	55	100%
< 9 Occupational Scales	23	55%	19	45%	42	100%
Area Scales	23	55%	19	45%	42	100%

that the subjects were counseled with respect to their SVIB scores and were likely prejudiced by these. In any case, evidence seems to suggest that both measured and expressed occupational interests are likely to be stable when in agreement with each other. When in disagreement, they seemingly tend to converge on each other.

The measure of expressed versus measured interests employed in this study should give a counselor an added measure of confidence in interpreting a profile where these are in agreement. In turn, he should regard with some suspicion a profile on which the most relevant area scale is in definite disagreement with an expressed occupational choice. As can be seen from Table 9, 89 percent of the subjects whose expressed and measured interests were in agreement had correlations above .85 for occupational profile stability, and only 11 percent had correlations below .85. Both of the measures, range of profile and expressed versus measured interests, thus appear to be useful to a counselor in deciding whether or not a client's profile represents stable interests.

The significant correlation between intelligence and interest stability is in contrast with findings of King (1958) for college freshmen, but agrees with findings of Disney (1945) for high school students. Comparing the populations of the three studies it appears that intelligence may be less a factor of stability with more homogeneous groups. College freshmen would be the most homogeneous group with respect to intelligence, high school students would be less so, and the subjects of this study would be the least homogeneous with some subjects incapable of work at the high school level and others

Table 9

(N = 45)

Expectancy Table Showing the Probability of having a Reliable
 Full Occupational or Area Profile Given an Above or Below
 Average Score on Expressed vs. Measured Interests

Expressed vs. Measured Interests	Percentage of Subjects with Profile Reliability					
	< .85		≥ .85		Total	
	N	%	N	%	N	%
Agreement						
Occupational Scales	2	11%	16	83%	18	100%
Area Scales	3	17%	15	83%	18	100%
Indeterminate or Disagreement						
Occupational Scales	10	37%	17	63%	27	100%
Area Scales	15	56%	12	44%	27	100%

who have completed 3 or 6 years of college. Intelligence may play a small role in the stability of interests, and only become a significant factor when extreme cases are involved. Whatever the reason, it appears that for populations similar to that of this study, subjects with lower intelligence are less likely to have reliable interest profiles.

The correlation of amount of education with interest stability is also probably due in part to the wide range of this variable in this group, and like intelligence, education may play a significant role only when extreme differences exist among subjects.

Although the VII is intended for use with persons with as little as a 9th grade education, several of the men in this study had only an 8th grade education, and in a few cases subjects did ask for an explanation of the meaning of some VII items. If reading the items of the inventory was a problem for some, it is unlikely that they could have been as consistent on test and retest as others with the necessary educational background. If this is the case, however, it is likely that it is a small minority of subjects who are responsible for the correlation between education and interest stability. The probable implication of the correlations of both intelligence and education with interest stability is that subjects at the lowest level of each may tend to have unreliable interest profiles, but as intelligence and amount of education increases a point is quickly reached at which these two factors cease to have a significant effect on interest stability.

Two other factors were significantly related to interest stability,

but not for the entire profile. "Active or discharged" status was correlated only with occupational profile stability, while opinion number 3 of the opinion questionnaire was correlated only with area profile stability. It was hypothesized that discharged patients should be functioning at a more normal level of mental adjustment and for that reason would likely be more in touch with reality and themselves and thereby more consistent. Although this did seem to be the case to some extent, the correlation with occupational profile stability was on the borderline for statistical significance, and in fact was not significant for the area profiles.

Results with "opinion #3" indicate that subjects who became bored with the inventory before completing it a second time were less likely to give consistent results between test and retest. Many of the subjects in this study took nearly one and one half hours to complete the inventory. This is a very long time to ask these subjects to concentrate on such a task.

In agreement with results found by King (1958) for the JVIB, age and marital status were found to be not significantly correlated with interest stability. With a median age of 42 nearly all of these subjects must have been well past the point at which interests mature and stabilize. (Darley and Hagenah, 1955)

The basic assumption that married persons are likely to be more stable overall than are single persons, was probably complicated by other factors due to the authors restricted coding of this variable. It is not necessarily logical that single, divorced, and separated persons should all be classified together.

Whether or not a subject was receiving drugs was expected to have an effect on consistency. However, all but 4 subjects were found to be receiving medication thus making a significant correlation nearly impossible.

That past occupational level and level of occupational choice were not significantly correlated with stability may result from the tendency for these subjects to cluster at the skilled level and below. It is also likely that other factors normally related to occupational level such as amount of education and/or intelligence were probably little differentiated over the lower occupational levels. In this case differences in stability of interests due to these factors would not have had any noticeable effect.

That activity level in therapy programs and use of the vocational counseling service were not significant variables was primarily due to the fact that the patients are often assigned to or encouraged to participate in these activities for therapeutic reasons, rather than on the basis of work interests. Men are moved forward in the program as their pathology permits, with work interests a second consideration.

The non-significant effect of diagnosis may have been partially due to the large number of subjects in one category. Only 20 of 97 patients were classified as other than psychotic.

The date of last admission and number of admissions were found to be inaccurate data. Hospital records available for this purpose did not list background information on a subject other than at Northampton Veterans Administration Hospital. Many of the subjects,

however, had been frequently in and out of other mental hospitals. No record of such activities was available for this study.

The opinion questionnaire was not tested for reliability and validity. Apparently, it did not measure that for which it was intended. Based upon other observations, it seems possible that the men were answering those items with the intent of pleasing, or at least not offending, the test administrator.

It did not appear to make any difference whether testing was done in a group or on an individual basis. The subjects did not work any less consistently in a group than in a more personal individual setting.

Whether or not test results were requested did not seem to indicate any special involvement in the test which might have prompted the subject to want to do a better than average job on the test.

It is noteworthy that over 30 percent of the subjects had no vocational preference whatsoever. This point underscores the passive-average work attitudes of these men.

As noted before, the Verification Scale of the NVII does not seem to be a measure of random or careless answering, but rather a masculinity-femininity scale. The findings of this study support such a conclusion. The average T-score was 16.5 which was only slightly less than the mean score (18.4) obtained on the basis of random responses found by Campbell and Trochim (1963) with a slightly longer version (9 more items) of the scale. With the median test-retest correlation of .91, however, responses certainly could not have been random. It seems most likely that as suggested by Merial (1965) the

high V-scores resulted from these subjects choosing more feminine activities not usually chosen by other men.

It is apparent that other factors for example, a measure similar to Hoyt's (1957) Depth Factor might be hypothesized to be correlated with interest stability. The need for investigating such factors has been pointed out by King (1958). Further research along the lines of the present study might also be extended to include the evaluation of multiple correlations for factors found to be associated with interest stability. Test-retest studies over longer time intervals also need to be undertaken.

The two factors found in this study to be most highly correlated with stability, range of profile (.66) and agreement of expressed and measured interests (.50) were moderately intercorrelated ($r = .34$). The two factors in combination yielded an estimated multiple correlation of .72 with interest stability. Approximately 52 percent of the variance in profile stability may be accounted for in terms of these two factors. As shown in Tables 10 and 11, only 7 percent (an improvement of 4 percent over the best single predictor) of those subjects whose expressed and measured interests were in agreement and whose range of profile scores were equal to or greater than 9 had correlations of occupational or area profile stability below .85.

As no other factors had correlations nearly as high as these two, it was felt to be impractical to compute additional multiple correlations with these data.

In this study, the Pearson product moment correlations were generally found to be more useful than the generalized distance

Table 10

(N = 45)

Impairment Score Showing the Probability of Having a Well-Developed Occupational Profile Given an Above or Below Average Score on Range of Profile and Degree of Impairment Interaction

Range of Profile and Degree of Impairment

Occupational Profile Stability

< .10 ≥ .10 None

Percentage of Subjects

1 2 3 4 5 6

Agreement

≥ 9
9

1 78 78 92 13 100
1 53 2 67 3 100

Disagreement

or

Disagreement

≥ 9
< 9

2 100 11 65 13 100
2 57 6 47 14 100

Table 11

(N = 45)

Expectancy Table Showing the Probability of Having a Reliable WWII
Area Profile Given an Above or Below Average score on
Range of Profile and Expressed vs Measured Interests

Range of Profile and Measure of
Expressed vs Measured Interests

Area Profile Stability

< .85 ≥ .85 Total

Percentage of Subjects

	N	%	N	%	N	%
Agreement						
≥ 9	1	7%	14	93%	15	100%
< 9	2	67%	1	33%	3	100%
Disagreement or Disagreement						
≥ 9	6	43%	8	57%	14	100%
< 9	9	69%	4	31%	13	100%

formula (D or D^2). The level of profile elevation (measured by D and D^2 , but not r) was felt to be more misleading than helpful in the interpretation of skill profiles. From the standpoint of the counselor, it is more laxative to work with the shape of a profile than with the absolute value of the scale scores. Although the height of a scale score is not entirely irrelevant, for counseling purposes it is more imperative to know the likelihood of the order of the scores remaining the same than to know by how much the difference between the first and second score, for example, is likely to change.

D and D^2 may be said to be misleading measures of similarity when they are significantly affected by changes in high scores which remain high and/or changes in low scores which remain low. The most important changes in a profile are those which occur across the mean from higher to lower or vice versa. This change is measured by r while the effect of changes at the extremes is minimized.

This situation is demonstrated by the test and retest profiles of two subjects in this study. For both subject #11 (Figures 2a and 2b) and subject #12 (Figures 3a and 3b), r was equal to .92, yet D for the first subject was 20.5 and for the second subject was 36.1, a significant difference (nearly $1\frac{1}{2}$ standard deviations apart). It will be seen from the profiles, however, that misleading differences in D for subject #11 resulted from large changes (greater than 10 points) among high scores on the Printer and Pressman scales and from large changes in low scores on the Sheet Metal Worker and Lumber scales. Thus, profile changes of little importance for counselor interpretation resulted in significant differences in overall profile similarity as

NAME _____ AGE _____ SEX _____ DATE _____

MINNESOTA VOCATIONAL INTEREST INVENTORY

OCCUPATIONAL SCALES	STD. SCORE ⁰	0	10	20	30	40	50	60
BAKER	43	.....	.....	.....	.....	.....	.....	.....
FOOD SERVICE MANAGER	44	.....	.....	.....	.....	.....	.....	.....
MILK WAGON DRIVER	50	.....	.....	.....	.....	.....	.....	.....
RETAIL SALES CLERK	49	.....	.....	.....	.....	.....	.....	.....
STOCK CLERK	53	.....	.....	.....	.....	.....	.....	.....
PRINTER	50	.....	.....	.....	.....	.....	.....	.....
TAB. MACHINE OPERATOR	37	.....	.....	.....	.....	.....	.....	.....
WAREHOUSEMAN	31	.....	.....	.....	.....	.....	.....	.....
HOSPITAL ATTENDANT	37	.....	.....	.....	.....	.....	.....	.....
PRESSMAN	46	.....	.....	.....	.....	.....	.....	.....
CARPENTER	39	.....	.....	.....	.....	.....	.....	.....
PAINTER	46	.....	.....	.....	.....	.....	.....	.....
PLASTERER	23	.....	.....	.....	.....	.....	.....	.....
TRUCK DRIVER	28	.....	.....	.....	.....	.....	.....	.....
TRUCK MECHANIC	11	.....	.....	.....	.....	.....	.....	.....
INDUSTRIAL EDUC. TEACHER	13	.....	.....	.....	.....	.....	.....	.....
SHEET METAL WORKER	23	.....	.....	.....	.....	.....	.....	.....
PLUMBER	5	.....	.....	.....	.....	.....	.....	.....
MACHINIST	34	.....	.....	.....	.....	.....	.....	.....
ELECTRICIAN	13	.....	.....	.....	.....	.....	.....	.....
RADIO-TV REPAIRMAN	21	.....	.....	.....	.....	.....	.....	.....
	
	
	
	

0. SCORES ABOVE 60 ARE PLOTTED AS 60.
 NEGATIVE SCORES ARE PLOTTED AS ZERO.

AREA SCALES	STD. SCORE	20	30	40	50	60	70	80
H-1 MECHANICAL	41	.....	.....	.....	.....	.....	.....	.....
H-2 HEALTH SERVICE	54	.....	.....	.....	.....	.....	.....	.....
H-3 OFFICE WORK	68	.....	.....	.....	.....	.....	.....	.....
H-4 ELECTRONICS	49	.....	.....	.....	.....	.....	.....	.....
H-5 FOOD SERVICE	53	.....	.....	.....	.....	.....	.....	.....
H-6 CARPENTRY	58	.....	.....	.....	.....	.....	.....	.....
H-7 SALES-OFFICE	59	.....	.....	.....	.....	.....	.....	.....
H-8 "CLEAN HANDS"	65	.....	.....	.....	.....	.....	.....	.....
H-9 OUTDOORS	41	.....	.....	.....	.....	.....	.....	.....

SEE OTHER SIDE FOR EXPLANATION

Figure 1. Profile Sheet (Front)

Figure 2b
Retest Profile for Subject #41

39

NAME _____ AGE _____ SEX _____ DATE _____

MINNESOTA VOCATIONAL INTEREST INVENTORY

OCCUPATIONAL SCALES	STO. SCORE ^o	0	10	20	30	40	50	60
BAKER	41	.....	.....	.....	.....	.....	.....	.....
FOOD SERVICE MANAGER	42	.....	.....	.....	.....	.....	.....	.....
MILK WAGON DRIVER	52	.....	.....	.....	.....	.....	.....	.....
RETAIL SALES CLERK	52	.....	.....	.....	.....	.....	.....	.....
STOCK CLERK	48	.....	.....	.....	.....	.....	.....	.....
PRINTER	50	.....	.....	.....	.....	.....	.....	.....
TAB. MACHINE OPERATOR	45	.....	.....	.....	.....	.....	.....	.....
WAREHOUSEMAN	39	.....	.....	.....	.....	.....	.....	.....
HOSPITAL ATTENDANT	39	.....	.....	.....	.....	.....	.....	.....
PRESSMAN	36	.....	.....	.....	.....	.....	.....	.....
CARPENTER	41	.....	.....	.....	.....	.....	.....	.....
PAINTER	40	.....	.....	.....	.....	.....	.....	.....
PLASTERER	23	.....	.....	.....	.....	.....	.....	.....
TRUCK DRIVER	31	.....	.....	.....	.....	.....	.....	.....
TRUCK MECHANIC	16	.....	.....	.....	.....	.....	.....	.....
INDUSTRIAL EDUC. TEACHER	-3	.....	.....	.....	.....	.....	.....	.....
SHEET METAL WORKER	13	.....	.....	.....	.....	.....	.....	.....
PLUMBER	5	.....	.....	.....	.....	.....	.....	.....
MACHINIST	29	.....	.....	.....	.....	.....	.....	.....
ELECTRICIAN	20	.....	.....	.....	.....	.....	.....	.....
RADIO-TV REPAIRMAN	24	.....	.....	.....	.....	.....	.....	.....
	
	
	
	

o. SCORES ABOVE 60 ARE PLOTTED AS 60.
NEGATIVE SCORES ARE PLOTTED AS ZERO.

AREA SCALES	STO. SCORE	20	30	40	50	60	70	80
H-1 MECHANICAL	36	.....	.....	.....	.....	.....	.....	.....
H-2 HEALTH SERVICE	59	.....	.....	.....	.....	.....	.....	.....
H-3 OFFICE WORK	62	.....	.....	.....	.....	.....	.....	.....
H-4 ELECTRONICS	46	.....	.....	.....	.....	.....	.....	.....
H-5 FOOD SERVICE	56	.....	.....	.....	.....	.....	.....	.....
H-6 CARPENTRY	61	.....	.....	.....	.....	.....	.....	.....
H-7 SALES-OFFICE	56	.....	.....	.....	.....	.....	.....	.....
H-8 "CLEAN HANDS"	75	.....	.....	.....	.....	.....	.....	.....
H-9 OUTDOORS	41	.....	.....	.....	.....	.....	.....	.....

SEE OTHER SIDE FOR EXPLANATION

Figure 1. Profile Sheet (Front)

NAME _____ AGE _____ SEX _____ DATE _____

MINNESOTA VOCATIONAL INTEREST INVENTORY

OCCUPATIONAL SCALES	STO. SCORE ⁰	0	10	20	30	40	50	60
BAKER	47	.....	.....	.....	.....	.....	.....	.....
FOOD SERVICE MANAGER	48	.....	.....	.....	.....	.....	.....	.....
MILK WAGON DRIVER	37	.....	.....	.....	.....	.....	.....	.....
RETAIL SALES CLERK	47	.....	.....	.....	.....	.....	.....	.....
STOCK CLERK	59	.....	.....	.....	.....	.....	.....	.....
PRINTER	56	.....	.....	.....	.....	.....	.....	.....
TAB. MACHINE OPERATOR	44	.....	.....	.....	.....	.....	.....	.....
WAREHOUSEMAN	24	.....	.....	.....	.....	.....	.....	.....
HOSPITAL ATTENDANT	48	.....	.....	.....	.....	.....	.....	.....
PRESSMAN	49	.....	.....	.....	.....	.....	.....	.....
CARPENTER	31	.....	.....	.....	.....	.....	.....	.....
PAINTER	41	.....	.....	.....	.....	.....	.....	.....
PLASTERER	27	.....	.....	.....	.....	.....	.....	.....
TRUCK DRIVER	11	.....	.....	.....	.....	.....	.....	.....
TRUCK MECHANIC	18	.....	.....	.....	.....	.....	.....	.....
INDUSTRIAL EDUC. TEACHER	33	.....	.....	.....	.....	.....	.....	.....
SHEET METAL WORKER	31	.....	.....	.....	.....	.....	.....	.....
PLUMBER	18	.....	.....	.....	.....	.....	.....	.....
MACHINIST	42	.....	.....	.....	.....	.....	.....	.....
ELECTRICIAN	26	.....	.....	.....	.....	.....	.....	.....
RADIO-TV REPAIRMAN	33	.....	.....	.....	.....	.....	.....	.....
	
	
	
	

0. SCORES ABOVE 60 ARE PLOTTED AS 60.
 NEGATIVE SCORES ARE PLOTTED AS ZERO.

AREA SCALES	STO. SCORE	STANDARD SCORES						
		20	30	40	50	60	70	80
H-1 MECHANICAL	28	.....	.....	.....	.....	.....	.....	.....
H-2 HEALTH SERVICE	64	.....	.....	.....	.....	.....	.....	.....
H-3 OFFICE WORK	53	.....	.....	.....	.....	.....	.....	.....
H-4 ELECTRONICS	38	.....	.....	.....	.....	.....	.....	.....
H-5 FOOD SERVICE	78	.....	.....	.....	.....	.....	.....	.....
H-6 CARPENTRY	45	.....	.....	.....	.....	.....	.....	.....
H-7 SALES-OFFICE	86	.....	.....	.....	.....	.....	.....	.....
H-8 "CLEAN HANDS"	55	.....	.....	.....	.....	.....	.....	.....
H-9 OUTDOORS	25	.....	.....	.....	.....	.....	.....	.....

SEE OTHER SIDE FOR EXPLANATION

Figure 1. Profile Sheet (Front)

NAME _____ AGE _____ SEX _____ DATE _____

MINNESOTA VOCATIONAL INTEREST INVENTORY

OCCUPATIONAL SCALES	STD. SCORE ⁰	0	10	20	30	40	50	60
1. BAKER	41	.....	.....	.....	.....	.....	.....	.....
2. FOOD SERVICE MANAGER	43	.....	.....	.....	.....	.....	.....	.....
3. MILK WAGON DRIVER	30	.....	.....	.....	.....	.....	.....	.....
4. RETAIL SALES CLERK	45	.....	.....	.....	.....	.....	.....	.....
5. STOCK CLERK	59	.....	.....	.....	.....	.....	.....	.....
6. PRINTER	70	.....	.....	.....	.....	.....	.....	.....
7. TAB. MACHINE OPERATOR	42	.....	.....	.....	.....	.....	.....	.....
8. WAREHOUSEMAN	30	.....	.....	.....	.....	.....	.....	.....
9. HOSPITAL ATTENDANT	41	.....	.....	.....	.....	.....	.....	.....
10. PRESSMAN	61	.....	.....	.....	.....	.....	.....	.....
11. CARPENTER	26	.....	.....	.....	.....	.....	.....	.....
12. PAINTER	43	.....	.....	.....	.....	.....	.....	.....
13. PLASTERER	17	.....	.....	.....	.....	.....	.....	.....
14. TRUCK DRIVER	01	.....	.....	.....	.....	.....	.....	.....
15. TRUCK MECHANIC	10	.....	.....	.....	.....	.....	.....	.....
16. INDUSTRIAL EDUC. TEACHER	26	.....	.....	.....	.....	.....	.....	.....
17. SHEET METAL WORKER	19	.....	.....	.....	.....	.....	.....	.....
18. PLUMBER	03	.....	.....	.....	.....	.....	.....	.....
19. MACHINIST	37	.....	.....	.....	.....	.....	.....	.....
20. ELECTRICIAN	23	.....	.....	.....	.....	.....	.....	.....
21. RADIO-TV REPAIRMAN	47	.....	.....	.....	.....	.....	.....	.....
	
	
	
	

0. SCORES ABOVE 60 ARE PLOTED AS 60.
 NEGATIVE SCORES ARE PLOTED AS ZERO.

AREA SCALES	STD. SCORE	STANDARD SCORES						
		20	30	40	50	60	70	80
H-1 MECHANICAL	32	.....	.....	.....	.....	.....	.....	.....
H-2 HEALTH SERVICE	57	.....	.....	.....	.....	.....	.....	.....
H-3 OFFICE WORK	53	.....	.....	.....	.....	.....	.....	.....
H-4 ELECTRONICS	38	.....	.....	.....	.....	.....	.....	.....
H-5 FOOD SERVICE	64	.....	.....	.....	.....	.....	.....	.....
H-6 CARPENTRY	39	.....	.....	.....	.....	.....	.....	.....
H-7 SALES-OFFICE	96	.....	.....	.....	.....	.....	.....	.....
H-8 "CLEAN HANDS"	55	.....	.....	.....	.....	.....	.....	.....
H-9 OUTDOORS	25	.....	.....	.....	.....	.....	.....	.....

SEE OTHER SIDE FOR EXPLANATION

Figure 1. Profile Sheet (Front)

measured by D.

Eliminating elevation as a factor to be considered in assessing similarity of profiles may not always be favorable (as with some personality inventories for instance), but similarity for interest inventories seems to be measured most meaningfully by considering only shape and scatter.

SUMMARY

The reliability of the Minnesota Vocational Interest Inventory with hospitalized male, mental patients ($N = 97$) was examined. All subjects, who were open ward patients between the ages of 20 and 55, were considered to be potential candidates for the job market. Test-retest reliabilities were determined for both the scales of the MVI and for individual occupational and area profiles.

Scale reliabilities of the occupational scales (med. $r = .83$) and the area scales (med. $r = .84$) for the psychiatric patients were found to be approximately the same as the reliabilities reported by Clark and Campbell (1965) for technical school students. The scale reliabilities tended to run lower, however, than those reported for the JVIB (med. $r = .91$) for a comparable time period (Strong and Campbell, 1966). Reliability of the MVI scales is satisfactory for counseling purposes, but individual interpretations should be made with caution.

Correlations between individual occupational and area profiles were found to be relatively high (med. $r = .91$ and $.90$ respectively), indicating that the MVI does yield stable profiles with hospitalized mental patients. The validity of the MVI with these patients, however, was questioned. The typical profile, which showed "white collar, clerical" interest, may reflect work aversion, or a passive orientation to work rather than true interests. Additional work needs to be done in establishing the validity of the MVI with psychiatric patients.

Various factors hypothesized to be correlates of interest stability were examined. Education, intelligence, range of profile and expressed versus measured vocational interests were significantly correlated with both occupational and area profile stability. Marginal significance was also found for discharged status and reported boredom.

The two best predictors of profile stability were range of profile and expressed versus measured interests. Range of profile correlated .66 with occupational profile stability and .44 with area profile stability. Expressed versus measured interests correlated .50 and .51 with stability of occupational and area profiles, respectively. An estimated multiple correlation using both predictors correlated .72 with occupational profile stability.

Based on findings of Hoyt (1960) indicating that with the SVIB when rho was equal to or greater than .75 counseling interpretations were essentially unchanged, a conservative estimate of .85 was used as a dividing point in this study.

Of subjects with range of profile scores equal to or greater than 9, only 11 percent were likely to have occupational profile reliabilities below .85, and 22 percent were likely to have area profile reliabilities below .85. For the entire group, 30 percent had occupational profile reliabilities below .85, and 36 percent had area profile reliabilities below .85.

When expressed and measured interests were in agreement, the percent of those with profile reliabilities below .85 for the occupational and area profiles was 11 and 17 percent respectively.

Only 7 percent of those subjects with both range of profile scores equal to or greater than 9 and expressed versus measured interests in agreement, had occupational or area profile reliabilities below .85. These two measures offer the counselor a quick and convenient means of assessing the likely stability of a counselee's profile.

Both a Pearson product moment correlation coefficient and the generalized distance formula (D and D^2) were used to measure profile similarity. As the counselor is usually more interested in rank order or spread than elevation of interests, r was the preferred measure of profile stability for this study. It was noted, however, that it is not always desirable to remove elevation as a component of similarity. With other types of tests and inventories, D or D^2 might be the better index of profile similarity.

In that stability of interests over long periods of time is still open to question, especially for subject populations for which the MVII is intended, it was recommended that long term reliability studies be initiated.

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APPENDIX

MINNESOTA VOCATIONAL INTEREST INVENTORY

A GUIDE TO UNDERSTANDING YOUR RESULTS

This inventory can help you decide if you are interested in the same things as men in various jobs.

THE RESULTS WILL NOT TELL YOU ANYTHING ABOUT WHAT YOU ARE CAPABLE OF DOING, OR ABOUT HOW HARD YOU ARE WILLING TO WORK. They will tell you something about how your likes and dislikes compare with those of men in several jobs that you may be considering.

Your scores are reported for several scales. These scales are divided into a group of OCCUPATIONAL SCALES, and a second group called AREA SCALES.

OCCUPATIONAL SCALES

Your score on each of these scales shows how much your interests are like those of men who are in that occupation. For example, if you have a high score on the Baker scale, this means you answered the questions very much as bakers do.

About 7 out of 10 men working in a given occupation score above 45 on their own scale. If you score above 45 on any scale, this tells you definitely that you have interests in common with men in that occupation. You probably would enjoy that work or a closely related job. If your score is between 35 and 45, you have expressed fewer likes and dislikes similar to those of men in that job. If your score is low—below 25—you definitely do not have the same interests as men in that job, and you probably would not enjoy the work.

AREA SCALES

Each of these scales contains questions that are closely related to each other. For example, one scale deals mostly with mechanical activities, another has mostly medical items. Following is a more complete description of each scale:

- H-1: These items are about mechanical things, machine operation and design, or home repairs of mechanical and electrical gadgets.
- H-2: This scale shows interests in medical and hospital service, or in working in medical or chemical laboratories.
- H-3: This scale shows interests in clerical work, office machines, bookkeeping and accounting, or in office management.
- H-4: These items deal with the building and operation of radio and other electronic equipment.
- H-5: These items are concerned mainly with menu planning and preparing food.
- H-6: This cluster deals with carpentry and furniture-making. Some items show a dislike for electrical-electronic or medical-chemical activities.
- H-7: Two clusters are covered by these items. The largest deals with speaking and writing; the other indicates interests in art and music. Other items show an interest in people; some show socially accepted, "highly thought of" activities.
- H-8: There is no simple theme in these items. They seem to measure one's preference for "clean hands" activities.
- H-9: Most items in this key show interests in athletics and outdoor activities. A second group deals with unskilled manual jobs and home repairs. They indicate dislike of feminine, indoor, verbal, and complex tasks.

SHADED BANDS

The shaded bands show the scores of the middle third of a group of skilled tradesmen. They give you some idea of how working men score on each scale.

These results will tell you more about your interests, and can help you in planning your future by suggesting kinds of jobs that you might find interesting. Of course, you must also think about many other things, especially your abilities and past experiences. If possible, you should talk with a skilled counselor who can tell you more about various occupations.

NAME

In the test below, the first word in each line is printed in capital letters. Opposite it are four other words. *Draw a line* under the *one word* which means the *same thing*, or most nearly the same thing, as the first word. A sample has been worked out for you. If you don't know, *guess*. Be sure to underline the *one word* in each line that means the same thing as the first word.

sample				
LARGE	red	<u>big</u>	silent	wet
begin here				
(1) TALK	draw	eat	speak	sleep
(2) PERMIT	allow	sew	cut	drive
(3) PARDON	forgive	pound	divide	tell
(4) COUCH	pin	eraser	sofa	glass
(5) REMEMBER	swim	recall	number	defy
(6) TUMBLE	drink	dress	fall	think
(7) HIDEOUS	silvery	tilted	young	dreadful
(8) CORDIAL	swift	muddy	leafy	hearty
(9) EVIDENT	green	obvious	sceptical	afraid
(10) IMPOSTOR	conductor	officer	book	pretender
(11) MERIT	deserve	distrust	fight	separate
(12) FASCINATE	welcome	fix	stir	enchant
(13) INDICATE	defy	excite	signify	bicker
(14) IGNORANT	red	sharp	uninformed	precise
(15) FORTIFY	submerge	strengthen	vent	deaden
(16) RENOWN	length	head	fame	loyalty
(17) NARRATE	yield	buy	associate	tell
(18) MASSIVE	bright	large	speedy	low
(19) HILARITY	laughter	speed	grace	malice
(20) SMIRCHED	stolen	pointed	remade	soiled
(21) SQUANDER	tease	belittle	cut	waste
(22) CAPTION	drum	ballast	heading	ape
(23) FACILITATE	help	turn	strip	bewilder
(24) JOCOSE	humorous	paltry	fervid	plain
(25) APPRISE	reduce	strew	inform	delight
(26) RUE	eat	lament	dominate	cure
(27) DENIZEN	senator	inhabitant	fish	atom
(28) DIVEST	dispossess	intrude	rally	pledge
(29) AMULET	charm	orphan	dingo	pond
(30) INEXORABLE	untidy	involatile	rigid	sparse
(31) SERRATED	dried	notched	armed	blunt
(32) LISSOM	moldy	loose	supple	convex
(33) MOLLIFY	mitigate	direct	pertain	abuse
(34) PLAGIARIZE	appropriate	intend	revoke	maintain
(35) ORIFICE	brush	hole	building	lute
(36) QUERULOUS	maniacal	curious	devout	complaining
(37) PARIAH	outcast	priest	lentil	locker
(38) ABET	waken	ensue	incite	placate
(39) TEMERITY	rashness	timidity	desire	kindness
(40) PRISTINE	vain	sound	first	level

NAME

Complete the following. Each dash (—) calls for either a number or a letter to be filled in. Every line is a separate item. Take the items in order, but don't spend too much time on any one.

start here

- (1) 1 2 3 4 5 —
(2) white black short long down — —
(3) AB BC CD D —
(4) Z Y X W V U —
(5) 1 2 3 2 1 2 3 4 3 2 3 4 5 4 3 4 5 6 — —
(6) NE/SW SE/NW E/W N/—
(7) escape scape cape — — —
(8) oh ho rat tar mood — — — —
(9) A Z B Y C X D —
(10) tot tot bard drab 537 — — —
(11) mist is wasp as pint in tone — — —
(12) 57326 73265 32657 26573 — — — —
(13) knit in spud up both to stay — — —
(14) Scotland landscape scapegoat — — — — ee
(15) surgeon 1234567 snore 17635 rogue — — — — —
(16) tam tan rib rid rat raw hip — — — —
(17) tar pitch throw saloon bar rod fee tip end plank — — — — — meals
(18) 3124 82 73 154 46 13 —
(19) lag leg pen pin big bog rob — — — —
(20) two w four r one o three —

Appendix C

Biographical Information Blank

NAME: _____

AGE: _____ MARITAL STATUS: _____

PRESENT OR LAST OCCUPATION: _____
(Give specific job title.) _____

AMOUNT OF EDUCATION:

(Number) _____ Years of grade school

_____ Years of high school

_____ Years of business, trade, or
technical school

_____ Years of college

ARE YOU PRESENTLY RECEIVING MEDICATION? _____

WHAT OCCUPATION WOULD YOU PREFER TO ENTER UPON LEAVING THE
HOSPITAL? _____DO YOU WISH TO KNOW THE RESULTS OF THE TESTS YOU ARE TAKING
FOR THE VA? (That is, your own scores?)

YES

NO

Appendix D
OPINION QUESTIONNAIRE

NAME _____ WARD _____ DATE _____

Check the answer which best shows your feeling about each sentence.

1. I feel that the results obtained from this test could be personally helpful to me.

() Strongly agree
() Agree
() Uncertain
() Disagree
() Strongly disagree

2. The test was easy for me to take.

() Strongly agree
() Agree
() Uncertain
() Disagree
() Strongly disagree

3. I thought the test was boring.

() Strongly agree
() Agree
() Uncertain
() Disagree
() Strongly disagree

4. I resented taking this test two times.

() Strongly agree
() Agree
() Uncertain
() Disagree
() Strongly disagree

Subjects	Scores
1	686153455837334736124155484110102418130219395047308661635537
1	676052466140344642273163403303102322110717325744368161596045
2	554438345135354429042429303641153629380717504573385839395545
2	564438385938354628002618322737154020470219494573365336396037
3	323032335141413141341726251736243622493452386965523930764929
3	343324305543342742401726171534294026543752476959544433666029
4	474432324829283639273441324145334435402427504747466939497556
4	473933335635284032124930364143334320362421504050465848567548
5	414022243831254431235840323146083022342321584053605648434941
5	434528243927215133195644273654083737382325584041575855394456
6	433344374332375030403418323027133435280819474068414248537548
6	35325543463942483214361821412500222223230365270524730565541
7	433159586043536037003119212205011926171331255468364433597052
7	463757565746556140062618172207002024161327275476364430698641
8	635357606261474840252930231100000700150833254770417533838133
8	554461576467485441292432091200000200130827255270386136837529
9	463950516554525739232432251706031007200536285976414433597041
9	553952546555546440252632300400000907250029255788364733667033
10	383345496046495048173115252205031913223451307165545027696029
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11	616043465741383647313938442211032720240821307147368958735525
11	575942465545343955464449442007062426260717307941309255636037
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14	414330455970423041612643170110261903372347325753386439965525
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17	635662606457404846211448422300031409091127236441388345765529
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19	454746424930345433124948383921152716191826395447525858465545
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27	273322284729274142275348343138334837431824565447384761494448
27	323126294830294149314143302034334337460822496747364270464456

^aFirst line for each subject is test scores, second line is retest scores.
(Appendix E continued on next page)

Appendix E (cont.)

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 28 403836415640464735254630582320104044300020414770305667464952
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 34 444946335141313933343952404130152901291822495053526458466037
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(Appendix E continued on next page)

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94 575462514841445636235660482711172924150005275262336973534960
94 625964515634375740125862463109032715240010275750307864596548
95 454932303930234734254152404745263431242820584241576748394456
95 535830284426195031174446385559224328322415634041547855394445
96 444447474947403739423937302015101716321620325756416161595537
96 515248505346374442213638252518062709360321326750416461636533
97 675756616748506533144126213803000915090214254276367848438633
97 675555576851485830193633193810000613120014324079337545537541

Appendix F

Raw Data: Predictor Variables, z, D, and D²
for Subjects

Subjects	Variables ^a															
	A	B	C	D	E	F	G	H	I	J	K	M	N	O	P	Q
1	4300930	00900000	154424	140011	511610	13	0676	2600	0273	1652	1832	1738				
2	5001428	021211	100029	999999	009061	202020	0544	2332	0128	1131	1832	1946				
3	3601299	099993	101499	999999	109059	171315	0371	1926	0376	1939	1658	1658				
4	5010827	001210	000015	555200	010311	161616	1061	3257	0373	1931	0908	1157				
5	5011399	021212	100299	999999	009031	141916	0607	2464	0472	2173	1589	0604				
6	3600822	009011	100119	999999	009051	231821	2454	4954	1197	3460	0648	0563				
7	5301025	011111	100141	110701	112120	1718	0190	1378	0554	2354	2647	1832				
8	3601219	022223	101133	231101	115111	1412	0555	2356	0291	1706	2298	2092				
9	4701432	010991	100019	999999	000140	161918	0496	2227	0304	1744	2298	2092				
10	3601220	020203	100999	999999	009141	121212	1546	3932	0183	1353	1256	2092				
11	4401127	012992	201119	999999	009090	141314	0593	2435	0423	2057	1832	1738				
12	3401233	011111	100015	555200	010711	141112	0723	2689	0464	2154	1472	1422				
13	5409999	029993	100299	999999	109139	131916	1441	3796	0521	2283	1528	1589				
14	4011331	019991	101134	444160	011001	121312	1484	3852	0397	1992	1589	1832				
15	4300928	010999	000199	999999	009100	212020	1028	3206	0122	1105	1528	1946				
16	3801328	022221	101029	999999	009081	171717	0388	1970	0399	1998	2092	1658				
17	4101638	009990	000029	999999	009061	081210	0204	1428	0091	0954	2647	2647				
18	5401223	020221	100014	442140	011611	191919	0878	2963	0392	1980	1832	1738				
19	5300828	009991	100144	111070	001100	172220	1732	4162	0856	2926	1045	0725				
20	3511799	021993	101999	999999	119070	141615	0880	2966	0162	1273	1472	1832				
21	5001023	011991	100035	443160	010501	72420	0856	2926	0135	1162	1188	1528				
22	2601027	099991	110029	999999	009159	161918	0368	1918	0123	1109	2092	2092				
23	5211640	022220	100299	999999	009141	171818	0748	2735	0119	1091	2092	2647				
24	3111328	010121	109025	455190	011111	141615	0911	3018	0262	1619	1589	1946				
25	2901699	099993	101499	999999	109179	121916	0762	2760	0760	2757	2092	1528				
26	3501633	009993	101899	999999	109089	132116	0816	2857	0692	2631	1422	0758				
27	3901333	020100	090124	311000	105116	1918	0577	2402	0401	2003	1293	1157				
28	3711639	041413	111499	999999	009101	201618	0446	2112	0200	1414	1832	1589				
29	4111299	132321	101129	999999	019131	152018	0541	2326	0051	0714	1946	2647				
30	3401499	022993	101699	999999	109129	212121	0532	2307	0234	1530	2298	2092				
31	5010821	009992	200014	432130	011201	82320	1088	3298	0468	2163	1589	1293				
32	2501533	099223	101399	999999	101141	191618	0597	2443	0157	1253	2092	1946				
33	2901231	011991	100019	999999	009079	161314	0635	2520	0255	1597	1293	1422				
34	4701222	021213	101199	999999	009091	181516	0947	3077	0430	2074	1256	0775				
35	3501035	012222	100143	331300	114116	1415	0341	1847	0161	1269	2298	2298				
36	5100823	001991	100024	443150	000601	51616	1466	3829	0171	1308	1157	1738				
37	2901223	021211	110019	999999	009051	131614	1933	4397	0634	2518	0996	0829				
38	4111233	012991	110024	211080	000901	31514	1298	3603	0392	1980	1293	1528				
39	5101126	022120	000059	999999	009051	162219	1041	3226	0201	1418	0996	1221				
40	2811299	021993	101599	999999	109049	121413	1693	4115	0455	2133	0549	0332				
41	4001119	001911	100159	999999	009101	121714	0704	2653	0222	1490	1589	1472				
42	4601227	011111	100129	999999	009041	140912	0893	2988	0414	2035	1020	0829				
43	4001328	012991	100014	411100	000801	61616	1922	4384	0328	1811	1045	1422				
44	5501215	119193	190799	999999	009141	141816	0986	3140	0353	1879	1528	1422				
45	4601299	012991	100019	999999	109069	131414	0760	2757	0128	1131	1472	2092				
46	4901130	012121	100153	555180	011211	81918	0700	2646	0292	1709	1946	1946				
47	5201299	012990	101799	999999	109179	181918	1056	3250	0416	2040	1832	1738				
48	2301299	012993	101199	999999	109119	162018	1397	3738	0655	2559	1333	1127				

(Appendix F continued on next page)

49	3301099	0202031004999999009101121916	1913	4374	0500	2236	0973	0973
50	4911228	0219931011999999119070212020	0474	2177	0405	2012	1658	1020
51	4700822	0111131114125109001061192020	0949	3081	0089	0943	0973	1658
52	4200999	0009910002999999119109111614	1407	3751	0898	2997	1256	1376
53	4501227	0201210002999999009151191416	1023	3198	0362	1903	1832	1738
54	5501028	1111110901999999000121161918	0546	2337	0216	1470	1946	0741
55	4201499	0992131002999999009071151113	1133	3366	0602	2454	0908	0663
56	2101224	0019910011433313101019171516	1332	3650	0513	2265	0929	0050
57	4411940	1494910011999999000051141514	0729	2700	0268	1637	1127	1256
58	3601299	0090911011999999009071191919	1026	3203	0695	2636	1528	0908
59	4300820	0212111002434112000061201518	1613	4016	0416	2040	0725	0908
60	4601227	0000210001345214000161211719	0478	2186	0262	1619	2298	1832
61	4700999	0129931913999999109029091512	0788	2807	0289	1700	1045	1293
62	5501339	0121200002999999009121182120	1199	3463	0302	1738	1832	1946
63	4501230	0029920001444315000120161516	1126	3356	0246	1568	1589	1832
64	4610819	0099910002999999001110181818	2095	4577	0637	2524	0908	1127
65	4101425	0121231013442313000101141816	1500	3873	0552	2349	1127	1020
66	2119999	0229900911999999119089191618	1400	3742	0710	2665	0793	0741
67	3300825	0101031913534517011131212020	0946	3076	0512	2263	1528	1376
68	4310824	0200931002999999009071221820	1466	3829	0666	2581	1157	1020
69	3101432	0209900012334414119089151616	1074	3277	0179	1338	1376	1738
70	4911238	0194920003444416001091201518	1460	3821	0342	1849	1221	1188
71	5501220	0012010001353314001091081813	3144	5607	2009	4482	0741	0523
72	4711224	0119910012999999009100171616	0603	2456	0268	1637	2092	2092
73	5001229	0999911002999999009030131715	1439	3793	1004	3169	0929	0848
74	4600821	0019910112432312001040212121	1280	3578	0343	1852	0848	0950
75	2911330	0111110002999999009041161616	0706	2657	0339	1841	1256	1589
76	5001228	0111100001999999009111191014	1500	3873	1245	3528	1333	0950
77	5009930	0090920001454518009021201618	0640	2530	0099	0995	1293	2298
78	5501434	0129910002999999009130222322	0360	1897	0378	1944	2298	1946
79	4200812	0191920013541111001141091512	0749	2737	0616	2482	1658	0908
80	4401328	0212121001551112001011172018	0532	2307	0204	1428	1221	1071
81	5001036	0090920002999999009031121514	0527	2296	0112	1058	1376	2298
82	2911220	0999910002999999009060162118	2018	4492	0126	1123	0709	1658
83	3700826	0111111013999999009101161114	0677	2602	0861	2934	1528	1376
84	4201427	0422210102999999009161172018	0535	2313	0232	1523	2298	2092
85	4411227	0119931011454417000050102116	1907	4367	0452	2126	0618	0811
86	3800831	0111031015141107000071191517	0879	2965	0997	3158	1472	0725
87	4001027	0129921112355518011110121514	0536	2315	0236	1536	1832	1946
88	3701426	0091100902999999019101232424	0557	2360	0201	1418	2092	2092
89	4701336	0099910006999999001110111412	0417	2042	0284	1685	2092	1832
90	2501231	0222231011424414101041141414	0701	2648	0288	1697	1422	1221
91	4101336	0229910001444416001150141514	0457	2138	0391	1977	2092	1422
92	4301226	0121210011999999019151191316	0226	1503	0342	1849	2647	2092
93	3001299	0219931011999999109039242122	0895	2992	0372	1929	1127	1157
94	5011228	0203900111324413011141171416	0773	2780	0776	2786	1946	1127
95	5500520	0099910104999999009070211920	0812	2850	0329	1814	1589	1376
96	4501128	0209910000199999001110162018	1068	3268	0277	1664	1422	1658
97	4701234	0121231015434314001161171616	0271	1646	0374	1934	2647	1946

Appendix F (Cont.)

^aIdentification of Lettered Variables in Appendix F

- A - age
- B - marital status (coded data)
- C - education (missing information)
- D - intelligence (missing information)
- E - drugs (coded data)
- F - occupational level (coded data; missing information)
- G - occupational field (coded data; missing information)
- H - level occupational choice (coded data; missing information)
- I - field occupational choice (coded data; missing information)
- J - activity level - therapy programs (coded data; missing information)
- K - use of vocational counseling service (coded data)
- L - diagnosis (coded data; missing information)
- M - date of last admission (coded data)
- N - number of admissions (missing information)
- O - opinion #1 (missing information)
- P - opinion #2 (missing information)
- Q - opinion #3 (missing information)
- R - opinion #4 (missing information)
- S - sum of attitudes toward test taking (missing information)
- T - test conditions (coded data)
- U - active or discharged (coded data)
- V - test results requested (coded data; missing information)
- W - measure of range of profile
- X - vocational preference (missing information)
- Y - V-score, 1st testing
- Z - V-score, 2nd testing
- AA - average V-score
- BB - D^2 for occupational profiles
- CC - D for occupational profiles
- DD - D^2 for area profiles
- EE - D for area profiles
- FF - z for occupational profiles
- GG - z for area profiles

See Table 4, p. 17, for keys used for coded data.

Disregard all 9's listed for one digit variables with missing information. Disregard all 99's listed for two digit variables with missing information. These numbers were used for computational purposes only.

