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ABSTRACT

Two studies were conducted to determine the ability of the Project MINI-SCORE test battery to differentiate among graduates from different vocational curriculums and among graduates and dropouts from selected vocational curriculums. The population used in the first study consisted of 1,696 graduates from seven predominantly male and five predominantly female occupational curriculums. Analyses of variance of mean scores revealed that there were substantial differences among persons who enter and graduate from different vocational programs on dimensions measured by the test battery. A sub-sample from two male and two female curriculums was selected for further investigation. Analysis of data by means of correlation techniques revealed that specific attempts to predict whether or not persons could drop out of each of the four programs based on data from each instrument were not as successful. The studies revealed that the instruments are capable of differentiating among curriculums to a much larger extent than they are capable of differentiating among graduates and dropouts within a given curriculum. A related document is available as ED 025 658. (Author)

DIFFERENTIATING AMONG GRADUATES OF VOCATIONAL-TECHNICAL CURRICULUMS

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Project MINI-SCORE
(Minnesota Student Characteristics and
Occupationally Related Education)
Department of Industrial Education
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Differentiating Among Graduates of
Vocational-Technical Curriculums

ABSTRACT

The studies reported are two in the series of Project MINI-SCORE studies investigating the ability of a number of standardized test measures to aid in predicting student success in full time vocational-technical courses in the Area Vocational-Technical Schools of Minnesota. The purposes of these two studies were to determine the ability of the General Aptitude Test Battery (GATB), the Minnesota Vocational Interest Inventory (MVII), the Sixteen Personality Factor Questionnaire (16PF), the Minnesota Importance Questionnaire (MIQ), the Vocational Development Inventory (VDI), and, the Minnesota Scholastic Aptitude Test (MSAT) to differentiate (1) among graduates from a sample of different vocational curriculums based on analyses of variance of mean scores, and (2) among graduates and drop-outs from selected vocational curriculums based on correlation techniques.

The population used in the first study consisted of graduates from seven predominantly male occupational curricula (Accounting-Male, Automotives, Carpentry, Machine Shop, Mechanical Drafting and Design, Power and Home Electricity, and Welding) and five predominantly female occupational curricula (Accounting-Female, Clerical, Cosmetology, Practical Nursing, and Secretarial). A total of 1,696 persons constituted the population with individual curriculum N's ranging from 69 to 323. Four of these curriculum areas, two male (Automotives and Welding), and two female (Practical Nursing and Secretarial Training), were selected to be further investigated in the second study.

The studies revealed that the instruments are capable of differentiating among curriculums to a much larger extent than they are capable of differentiating among graduates and drop-outs within a given curriculum. Table 1 summarizes the number of scales for each of the instruments which were capable of differentiating among the groups of male and female curricula.

There is no doubt that there are substantial differences among persons who enter and graduate from different vocational programs on dimensions such as aptitudes, interests, personality factors, job needs and vocational maturity, as measured by the Project MINI-SCORE battery. Three-fourths or more of the scales of each of the instruments were capable of differentiating, at the .05 level or above, graduates within the group of female curricula studied. All but two of the instruments similarly differentiated within the group of male curricula. The two exceptions for the male group of curricula were the 16 PF with 43.8 per cent of the scales, and the MIQ with 26.7 per cent of the scales significantly differentiating the male curricula.

The second study of the differences between graduates and drop-outs revealed that specific attempts to predict whether or not persons would drop-out of each of the four programs based on data from each instrument were not as successful.

TABLE 1

THE NUMBER OF SCALES OF EACH INSTRUMENT WHICH SIGNIFICANTLY DIFFERENTIATED THE MALE CURRICULA AND FEMALE CURRICULA BASED ON ANALYSES OF VARIANCE OF MEAN SCORES

	Number of Scales	MALE		FEMALE		% of Scales Sig. at .05 or above	
		.01 level	.05 level	.01 level	.05 level	MALE	FEMALE
GATB	7	7		5	2	100.0	100.0
MVII	9	8		9		88.9	100.0
16 PF	16	5	2	8	4	43.8	75.0
MIQ	30	4	4	21	4	26.7	86.7
VDI	1		1	1		100.0	100.0
MSAT	1	1		1		100.0	100.0

Table 2 summarizes the number of scales of each instrument which had zero-order correlations with the criterion (graduate versus drop-out) significantly different than zero at the .05 level for each of the four curriculum areas studied.

TABLE 2

NUMBER OF SCALES OF EACH INSTRUMENT WHICH CORRELATED SIGNIFICANTLY WITH THE CRITERION AT THE .05 LEVEL FOR EACH CURRICULUM

	Number of Scales	AUTO.	WELD.	PRAC. NURS.	SEC.
GATB	7	0	0	0	3
MVII	9	1	0	0	2
16 PF	16	3	0	1	2
MIQ	30	3	2	0	6
VDI	1	0	0	0	0
MSAT	1	0	0	0	0

Relatively few scales correlated significantly with the drop-graduate criterion for each of the curriculum areas. More scales differentiated between graduates and drop-outs from the automotives and secretarial curriculums than the welding and practical nursing curriculums.

Table 3 summarizes the multiple correlation coefficients between the composite derived from all of the scales of a given instrument and the criterion for each instrument in regard to each curriculum. Only two of the multiple correlation coefficients were significant--the correlations between the 16 PF composite and the criterion, and the MIQ composite and the criterion for the automotives group.

TABLE 3

MULTIPLE CORRELATIONS BETWEEN THE COMPOSITES DERIVED FROM ALL OF THE SCALES OF EACH INSTRUMENT AND THE CRITERION FOR EACH CURRICULUM

	AUTO.	WELD.	PRAC. NURS.	SEC.
GATB	.197	.142	.144	.135
MVII	.196	.190	.148	.200
16 PF	*.299	.255	.232	.254
MIQ	*.371	.475	.311	.315
VDI	.042	.040	.088	.018
MSAT	-.045	-.034	-.050	.084

*Significant at the .05 level

The findings from the second study were not surprising. Persons were counseled and selected before they entered the vocational programs. Pre-selection tends to make the groups more homogeneous, and therefore, it is difficult to differentiate sub-sets (graduates and drop-outs) from these homogeneous groups.

Discussions with personnel at the area vocational-technical schools who are in charge of admissions indicated that since more automotives and secretarial programs exist in the schools than welding and practical nursing programs, the selectivity is not as great and, therefore, the groups are more heterogeneous. This heterogeneity possibly explains the reason why the findings of the second study indicate that the instruments are more capable of differentiating graduates from drop-outs of the automotives and secretarial programs.

Another possible reason for not finding differences might be in the definition of drop-outs used. The drop-out group included persons who were accepted for training but did not show up for training as well as persons who left after starting the programs. The elimination of this group from the drop-out group might result in larger differences.

The results of these two studies are very encouraging. They show that differences on measures of aptitudes, interests, personality factors, job needs and vocational maturity as measured with standardized instruments do exist between persons who succeed in different training programs. Knowledge of the differences between persons successful in different training programs will be very valuable to students as they choose to train for an occupation. Knowledge of the these

differences will also be very valuable to counselors associated with vocational schools as they help students select training programs in which they have reasonable chances of succeeding.

INTRODUCTION

Project MINI-SCORE is a six year research project begun in 1966, and funded by the U.S. Office of Education. It is administered by two staff members of the Department of Industrial Education, University of Minnesota. The Project has the primary purpose of identifying criteria useful to counselors and others in admitting and counseling applicants to post-high school vocational-technical schools as they seek to pursue specific vocational-technical curricula.

Test data have been gathered on individual applicants to the Area Vocational-Technical Schools of Minnesota consisting of measures derived from six separate instruments and test batteries: (1) the General Aptitude Test Battery (form B), (2) the Minnesota Vocational Interest Inventory, (3) the Sixteen Personality Factor Questionnaire (form C), (4) the Minnesota Importance Questionnaire, (5) the Vocational Development Inventory, (6) the Minnesota Scholastic Aptitude Test. All but two of these instruments have more than one scale. The data are being analyzed to determine which elements are useful in predicting success in full time vocational-technical courses in the Area Vocational-Technical Schools of Minnesota.

OBJECTIVES

The purposes of this Project MINI-SCORE sub-study were to determine the ability of each of these instruments to differentiate (1) among graduates from a sample of vocational curriculums based on analyses of variance of mean scores, and (2) among graduates and drop-outs from selected vocational curriculums based on multiple correlation techniques.

The study report is divided into two sections. The first section (DISCRIMINATING BETWEEN CURRICULA) reports the investigation of differences between graduates from different curricula as stated in purpose one. The second section (DISCRIMINATING WITHIN CURRICULA) reports the investigation of potential differences between graduates and drop-outs from selected curricula as stated in purpose two.

PART ONE
DISCRIMINATING BETWEEN CURRICULA

Purpose

The purpose was to determine the ability of each of the scales of each of the six instruments included in the Project MINI-SCORE test battery to differentiate among graduates from different vocational-technical curricula.

In addition to reporting the ability of the scales to distinguish among different vocational curricula, the report contains appendices which discuss the findings pertaining to each of the scales of each of the six separate instruments in detail.

Appendix A -- General Aptitude Test Battery (form B) (GATB)
Appendix B -- Minnesota Vocational Interest Inventory (MVII)
Appendix C -- Sixteen Personality Factor Questionnaire(form C) (16PF)
Appendix D -- Minnesota Importance Questionnaire (MIQ)
Appendix E -- Vocational Development Inventory (VDI)
Appendix F -- Minnesota Scholastic Aptitude Test (MSAT)

Population

The study population consisted of students who had taken the Project MINI-SCORE test battery upon application to one of twenty-four Minnesota area vocational-technical schools during the period from September 1, 1966 to June, 1968 and who had subsequently graduated before July, 1969. Table I reports the sample of 12 curriculums, seven predominantly male and five predominantly female, which were selected from among the 63 curriculum areas being studied in Project MINI-SCORE. A total of 1,696 persons who graduated from these 12 curriculums constituted the population for the study with individual curriculum N's ranging from 69 to 323. Complete data were available on all instruments except the MSAT for each subject. Therefore, the numbers of persons with MSAT data from each curriculum are reported separately.

TABLE I

CURRICULUM AREAS INVESTIGATED

CURRICULUM	NO. OF GRADS.	
	Total	with MSAT
Primarily Male Curriculums		
Accounting-Male[1]	92	87
Automotives	171	155
Carpentry	69	62
Machine Shop	71	63
Mechanical Drafting and Design	91	83
Power and Home Electricity	71	67
Welding	114	101
Primarily Female Curriculums		
Accounting-Female[1]	96	79
Clerical	222	206
Cosmetology	120	114
Practical Nursing	256	216
Secretarial	323	304

[1]Because the accounting curriculum graduates included about 50% males and 50% females, the curriculum was analyzed separately by sex.

Descriptive data gathered by Project MINI-SCORE when the vocational school graduates applied to the schools before training indicated that the people who enrolled in the various curriculums were very similar.

Age Most students were 18 or 19 years old when they applied for entry to the vocational programs. In all curriculums but one, 95 per cent were between the ages of 17 and 25. The exception was the practical nursing curriculum with a mean age of 20.7 and an age range of from 17 to 53 years. Except for practical nursing the mean age of the female occupations tended to be several months less than the male occupations.

Prior Education There was little difference in mean number of years of prior education between graduates from all of the curriculums (male and female). Almost all of the vocational graduates had graduated from high school. The per cent of high school graduates ranged from 95.6 per cent for welding to 99.6 per cent for clerical.

Marital Status As expected for this age group, most were single with only themselves as dependants. The per cent of persons in the different

curricula who were married ranged from 2 per cent for clerical to as much as 15 per cent for practical nursing.

Trade Changes Most of the persons who enrolled graduated from the original curriculum they entered. The per cent of graduates that changed curriculums after enrolling for each curriculum ranged from 0 per cent for practical nursing to 4 per cent for power and home electricity.

Prior High School Vocational Training There was a wide range in the number of graduates of the different curriculums who had prior high school vocational training (15 to 74 per cent). Clerical and secretarial graduates had received the most prior high school training; practical nursing, power and home electricity and cosmetology the least.

Prior Post-High School Vocational Training Few students claimed prior post-high school vocational training. Practical nurses, the oldest group, had the highest percentage (11 per cent). The other groups varied from 2 to 7 per cent. Most who had prior post-high training considered it related to the program for which they applied.

Work Experience Forty-one per cent of the practical nursing group had related work experience, the other curriculums varied from 17 per cent for carpentry to a low of 2 per cent for cosmetology. Among the predominantly female curriculums the number of graduates who had prior unrelated work experience varied from 40 to 51 per cent and among the male curriculums from 44 to 81 per cent.

Sex The accounting curriculum was almost evenly divided, 49 per cent male, 51 per cent female. The other curriculums enrolled from 0 to 2 per cent of the "other" sex.

Procedure

Each of the separate scales of the total Project MINI-SCORE battery were analyzed to determine the ability of the scales to distinguish among curricula. One-way analyses of variance (ANOVA) were used with significant F-test results reported at the .05 and .01 levels. Four ANOVA were run on each scale. The first two analyses concerned the ability of each scale to differentiate (a) the total of seven primarily male curriculums, and (b) the total of five primarily female curriculums. Investigation of the individual curriculum mean scores revealed that one of the male and one of the female curriculums were accounting for a large amount of the differences within their respective groups of curriculums on a number of scales. Therefore, that occupation which was very different was removed from each of the groups and the scales re-analyzed to determine if

significant differences existed among the remaining occupations. The curriculum removed from the group of male curricula was accounting (male) and the curriculum removed from the group of female curricula was practical nursing. By making the groups of curriculums more homogeneous, a more precise assessment of the ability of the instruments to distinguish among curriculums was possible. Throughout this report the groups of curricula with all male or all female curricula are called the "total" groups and the male group of curricula without the accounting (male) curriculum and the female group of curricula without the practical nursing curriculum are referred to as the "restricted" groups.

Results

The results relating to each of the six separate instruments along with tables of one-way ANOVA F-values are reported below. (See the appendices for full tables including individual curriculum mean scores and standard deviations.)

The General Aptitude Test Battery

The written portion of the GATB consists of eight part scores which have been re-interpreted as seven factorially derived aptitude scores (GATB Manual, Sec. III, 1967). The aptitude scores were analyzed in this study.

The GATB was very effective in distinguishing between both the groups of male and female curriculums. F-values for the analyses of variance along with their significance levels are reported for the GATB aptitude scales in Table II. There were significant differences between both groups of male curriculums on all scales at the .01 level. For the female curriculums the GATB was only slightly less effective, with all scales significant at the .05 level or above except K-Motor Coordination for the restricted female group of curriculums. (Appendix A discusses each GATB aptitude in terms of group differences as well as individual curriculum mean scores and standard deviations.)

TABLE II

ANOVA OF DIFFERENCES BETWEEN CURRICULUM GROUPS
(GATB B-1002(FORM B) APTITUDE SCALES)

SCALES	F - VALUE			
	TOTAL MALE GROUP	RESTRICTED MALE GROUP	TOTAL FEMALE GROUP	RESTRICTED FEMALE GROUP
G-Intelligence	15.32**	15.20**	18.69**	22.55**
V-Verbal Aptitude	11.44**	7.07**	19.50**	18.78**
N-Numerical Aptitude	18.80**	13.66**	23.08**	30.67**
S-Spatial Aptitude	7.49**	7.63**	3.69**	3.85**
P-Form Perception	5.66**	5.71**	8.47**	10.95**
Q-Clerical Perception	10.09**	3.98**	3.15*	4.26**
K-Motor Coordination	5.60**	5.50**	2.70*	.68

*Significant at .05
**Significant at .01

The Minnesota Vocational Interest Inventory

The MVII (Clark and Campbell, 1965) provides scores on 21 occupational keys as well as nine "Homogeneous Keys" which have been derived factorially from the occupational keys. The analyses of variance were done only on the raw scores obtained from the nine homogeneous keys.[1] Results are reported in Table III.

Like the GATB, the MVII was generally effective in distinguishing between both groups of male and female curricula. Twenty-eight of the 36 ANOVA's were significant at the .01 level, and 2 more at the .05 level. This test is particularly affected by the removal of the one curriculum from each curriculum group, with the F-value dropping considerably in many cases between the total and the restricted group analyses. (A more detailed interpretation of the MVII scales, along with individual curriculum mean scores and standard deviations is reported in Appendix B.)

[1]Due to highly skewed MVII score distributions chi-square analyses were run as well as ANOVA analyses to determine if non-parametric results would agree with the parametric tests results. The results of the two methods agreed for 33 of the 36 tests. Discrepancies were discovered in the H-9 restricted males analysis and the H-4 and H-9 restricted females analyses.

TABLE III

ANOVA OF DIFFERENCES BETWEEN CURRICULUM GROUPS
(MVII HOMOGENEOUS KEYS)

SCALES	F - VALUES			
	TOTAL MALE GROUP	RESTRICTED MALE GROUP	TOTAL FEMALE GROUP	RESTRICTED FEMALE GROUP
H-1 Mechanical	83.17**	3.68**	8.14**	9.18**
H-2 Health Service	3.92**	4.60**	237.67**	10.76**
H-3 Office Work	227.24**	1.51	214.86**	42.26**
H-4 Electronics	52.13**	35.61**	20.69**	3.62*
H-5 Food Service	1.34	1.61	18.82**	9.89**
H-6 Carpentry	38.00**	43.87**	3.38**	3.87**
H-7 Sales-Office	21.93**	10.49**	30.40**	2.33
H-8 Clean Hands	38.11**	1.75	48.13**	9.74**
H-9 Outdoors	34.63**	2.77*	5.22**	2.34

*Significant at .05
**Significant at .01

The Sixteen Personality Factor Questionnaire

The 16 PF consists of scales which measure 16 theoretically independent facets of personality (16 PF Handbook, 1962). The analyses of variance results are reported in Table IV.

The 16 PF was not as effective as the GATB and the MVII in distinguishing between curriculums. Using the total male group of curriculums, only seven of the 16 scales significantly differentiated the curricula at the .05 level or above. It was more effective for the total female curriculum group, with 12 of the 16 scales significant at the .05 level or above. Six of the 16 scales were effective for both the total male and the total female curriculum groups. An analysis of the restricted groups of curriculums revealed that only three scales significantly differentiated the remaining male curriculums and that five scales significantly differentiated the remaining female curricula at the .05 level or above. Only two scales (B-Dull vs. Bright and M-Conventional vs. Eccentric)

significantly differentiated curricula within both the restricted male and female groups. (A more detailed interpretation of the 16 PF scales, along with individual curriculum mean scores and standard deviations is reported in Appendix C.)

TABLE IV

ANOVA OF DIFFERENCES BETWEEN CURRICULUM GROUPS
(16 PF QUESTIONNAIRE SCALES, FORM C)

SCALES	F - VALUE			
	TOTAL MALE GROUP	RESTRICTED MALE GROUP	TOTAL FEMALE GROUP	RESTRICTED FEMALE GROUP
A-Aloof vs. Outgoing	6.46**	1.05	14.28**	6.13**
B-Dull vs. Bright	7.48**	8.16**	4.73**	3.91**
C-Emotional vs. Mature	1.01	1.09	3.83**	1.36
E-Submissive vs. Dominant	.44	.45	.44	.61
F-Glum vs. Enthusiastic	1.01	1.06	3.41**	1.62
G-Casual vs. Conscientious	1.11	1.21	1.03	1.13
H-Timid vs. Adventurous	1.34	1.42	10.35**	1.31
I-Tough vs. Sensitive	3.45**	.10	3.25*	3.84**
L-Trustful vs. Suspecting	1.23	1.50	3.04*	.58
M-Conventional vs. Eccent.	3.45**	4.06**	2.63*	3.20*
N-Simple vs. Sophisticated	.97	1.18	2.20	.20
O-Confident vs. Insecure	2.89**	2.73*	1.70	1.16
Q1-Conserv. vs. Experim.	2.81**	1.92	9.74**	1.22
Q2-Dependent vs. Self-Suf.	2.50*	2.16	3.14*	1.50
Q3-Uncontrol. vs. Self Con.	.70	.76	14.71**	2.80*
Q4-Stable vs. Tense	1.37	1.71	7.65**	.78

*Significant at .05
**Significant at .01

The Minnesota Importance Questionnaire

The MIQ (Weiss and others, 1964, 1966), was used in the 30-scale version to measure different dimensions of job needs. Analyses of variance results for each of the 30 scales are reported in Table V.

The MIQ was considerably more effective in terms of discriminating the female groups than the male groups. For the total female group, 25 of the 30 scales were significant at the .05 level or above. For the total male group, nine of the 30

TABLE V

ANOVA OF DIFFERENCES BETWEEN CURRICULUM GROUPS
(MINNESOTA IMPORTANCE QUESTIONNAIRE - 30 SCALES)

	SCALES	F - VALUE TOTAL MALE GROUP	RESTRICTED MALE GROUP	TOTAL FEMALE GROUP	RESTRICTED FEMALE GROUP
1.	Ability Utilization	1.52	1.64	3.50**	2.87*
2.	Achievement	1.40	1.46	8.27**	1.51
3.	Activity	2.65*	1.72	5.76**	3.66*
4.	Advancement	4.64**	3.84**	64.48**	1.34
5.	Authority	1.37	1.07	3.35**	.46
6.	Company Pol. & Prac.	1.96	2.08	3.05*	1.62
7.	Compensation I	1.29	1.65	16.62**	.74
8.	Co-workers	1.12	1.25	4.37**	2.49
9.	Creativity	1.56	.70	33.77**	16.73**
10.	Independence	4.42**	4.06**	14.06**	1.68
11.	Moral Values	.38	.38	2.55**	1.39
12.	Recognition	.26	.26	23.19**	2.38
13.	Responsibility	2.50*	1.58	12.22**	4.18**
14.	Security	2.37*	1.79	2.06	.08
15.	Social Service	5.24**	5.80**	66.26**	5.53**
16.	Social Status	.71	.85	14.79**	.85
17.	Supervisor-Human Rel.	.71	.85	2.37	.31
18.	Supervisor-Technical	1.68	1.07	1.46	1.41
19.	Variety	4.53**	3.26**	2.88*	2.18
20.	Working Conditions	.24	.13	8.59**	1.14
21.	Work Challenge	.92	1.10	11.92**	2.25
22.	Company Image	2.11*	1.89	2.50*	.49
23.	Organization Control	2.34*	1.30	21.20**	3.76*
24.	Feed Back	1.55	1.26	2.24	1.79
25.	Physical Facilities	1.62	.99	6.64**	5.77**
26.	Work Relevance	1.28	1.54	.64	.37
27.	Company Prestige	1.26	1.53	6.15**	2.63*
28.	Company Goals	.66	.59	2.98*	.83
29.	Closure	1.39	1.51	4.20**	2.06
30.	Compensation II	1.52	1.86	8.19**	.58

*Significant at .05
**Significant at .01

scales were significant at the .05 level or above. Six scales significantly differentiated the curriculums in the restricted female group of curriculums and four scales significantly differentiated the curriculums in the restricted male group of curriculums at the .05 level or above. Only one scale, Social Service,

was significant across all four analyses. (A more detailed interpretation of the MIQ scales, along with individual curriculum mean scores and standard deviations is reported in Appendix D.)

The Vocational Development Inventory

The VDI (Crites, 1965), used by Project MINI-SCORE, is designed to measure attitudes concerning vocational development. It consists of only one scale. Table VI presents the results of the analyses of variance.

TABLE VI

ANOVA OF DIFFERENCES BETWEEN CURRICULUM GROUPS
(VOCATIONAL DEVELOPMENT INVENTORY SCORE)

SCALES	F - VALUE			
	TOTAL MALE GROUP	RESTRICTED MALE GROUP	TOTAL FEMALE GROUP	RESTRICTED FEMALE GROUP
VDI Score	2.40*	2.76*	25.84**	4.70**

*Significant at .05
**Significant at .01

Results indicate that the VDI was able to differentiate between both the total and restricted male and female groups of curriculums. All ANOVA comparisons were significant at the .05 level or above. (A more detailed interpretation of the VDI scale, along with individual curriculum mean scores and standard deviations is reported in Appendix E.)

The Minnesota Scholastic Aptitude Test

The MSAT (Berdie and others, 1962) was used as a measure of scholastic aptitude. Since test scores were gathered from the Minnesota Statewide Testing Program rather than the test being administered to all applicants by Project MINI-SCORE,

all applicants did not have MSAT scores (numbers are presented in Table I). Table VII presents the results of the analyses of variance.

TABLE VII

ANOVA OF DIFFERENCES BETWEEN CURRICULUM GROUPS
(MINNESOTA SCHOLASTIC APTITUDE TEST SCORE)

SCALES	F - VALUE			
	TOTAL MALE GROUP	RESTRICTED MALE GROUP	TOTAL FEMALE GROUP	RESTRICTED FEMALE GROUP
MSAT Score	5.43**	5.12**	20.51**	18.11**

**Significant at .01

All comparisons were significant at the .01 level indicating that the curriculums within both the male and female groups differed on the basis of scholastic aptitude. (A more detailed interpretation of the MSAT scale, along with individual curriculum mean scores and standard deviations is reported in Appendix F.)

Summary PART I

An investigation of the ability of standardized instruments measuring aptitudes, interest, personality, job needs and vocational maturity was conducted to determine if such measures can differentiate persons who successfully graduate from different vocational-technical curricula. A sample of 12 curriculums, seven predominantly male and five predominantly female, were selected from among the 63 curriculum areas being studied in Project MINI-SCORE. There were a total of 1,696 graduates from these 12 curriculums, with individual curriculum N's ranging from 69 to 323. Descriptive data indicated that these groups were very homogeneous on such variables as age, prior education, marital status, prior work experience and prior vocational training.

Curriculum group differences on each scale of each instrument were analyzed by one-way analyses of variance to test the ability of each of the Project MINI-SCORE test battery scales to discriminate between curriculums. Analyses were done on the predominantly female and the predominantly male groups separately. It was discovered that one curriculum in the group of female curriculums and one curriculum in the group of male curriculums seemed to be consistently different from the others. Those curriculums were removed from their respective groups and the analyses of variance were repeated on the "restricted" groups.

The results indicated that groups of graduates from different curricula are significantly different on some of the scales of each instrument. The majority of the scales on the General Aptitude Test Battery and the Minnesota Vocational Interest Inventory differentiated both the male and the female groups. The Vocational Development Inventory scale and the Minnesota Scholastic Aptitude Test scale also differentiated among curricula in both groups. Both the Sixteen Personality Factor Questionnaire and the Minnesota Importance Questionnaire had more scales which differentiated the female curriculum groups than the male curriculum groups. This finding may be partially due to the fact that there appears to be a greater range of occupations among the female curricula studied than among the male curricula.

The conclusion reached based upon the results of this study is that groups of successful male and female graduates from relatively homogeneous groups of curricula are different on many of the dimensions measured by the Project MINI-SCORE test battery. Detailed knowledge of how these differences relate to success in different curricula will greatly facilitate counseling youth in terms of occupational choices.

PART TWO
DISCRIMINATING WITHIN CURRICULA

Purpose

The purpose of this section of the study was to determine the effectiveness of each of the instruments included in the Project MINI-SCORE test battery to differentiate between graduates and drop-outs of selected vocational-technical curricula using correlation techniques.

Population

The graduate population was identical to that described in PART ONE except that four curriculum areas were studied rather than twelve. The drop-out population consisted of persons who enrolled in one of the four curriculum areas during the same period as the graduates but who later dropped out of the program. Drop-outs were defined as persons who applied to programs and were accepted but did not complete the programs. The four curriculum areas studied were automotives, welding, practical nursing and secretarial training. Two of the four areas selected primarily enrolled males and two primarily enrolled females. Table VIII reports the number of graduates and drop-outs from each of the four curriculums. Complete data were available on all of the measures for each person except the MSAT. Therefore, the number of persons with MSAT scores are reported separately.

Procedure

The ability of each of the scales of each of the instruments as well as the ability of each of the total instruments to predict graduation versus dropping out of each of the four curriculum areas was investigated using correlation techniques. Zero order correlations were calculated between each of the scales of each instrument and the dichotomous criterion (graduated versus dropped) in order

TABLE VIII

CURRICULUM AREAS INVESTIGATED

CURRICULUM	NO. OF GRADS.		NO. OF DROPS	
	Total	With MSAT	Total	With MSAT
Primarily Male Occupations				
Automotives	171	155	136	114
Welding	114	101	43	34
Primarily Female Occupations				
Practical Nursing	256	216	23	16
Secretarial Training	323	304	74	63

to determine the ability of each scale to predict the criterion. Multiple correlations were computed to determine the ability of a composite, developed using all of the scales of a given instrument, to predict the criterion. The multiple correlations and the zero order correlations were computed using the University of Minnesota's computer program UMST 580 which performs a step-wise solution dropping out the least significant predictor and recalculating the equation until all variables remaining in the equation are significant at a given level or until only one variable remains in the equation.

Results

The results relating to each of the six separate instruments are reported below along with tables summarizing the zero-order correlations between each of the instrument scales and the criterion and the step-wise multiple correlations.

The General Aptitude Test Battery

Table IX summarizes the zero-order correlations between the written aptitude scores of the GATB and the criterion for each of the four curriculum areas. Only three of the zero-order correlations were significant at the .05 level. The

three scales were G-Intelligence, N-Numerical Aptitude and Q-Clerical Perception for the secretarial group.

TABLE IX

ZERO ORDER CORRELATIONS BETWEEN GATB APTITUDE SCORES AND CRITERION

VARIABLE	AUTO.	WELD.	PRAC. NURS.	SEC.
1. G-Intelligence	.043	-.065	.057	*.101
2. V-Verbal	-.034	-.106	-.009	.071
3. N-Numerical Aptitude	.015	-.040	.060	*.107
4. S-Spatial	.083	-.018	.015	.031
5. P-Form Perception	-.078	-.049	.104	.062
6. Q-Clerical Perception	-.005	-.006	.061	*.098
7. K-Motor Coordination	.027	-.034	-.022	-.015

*Significant at the .05 level

Table X reports the multiple correlation coefficients associated with predicting the criterion using the written GATB aptitude scores for each of the four groups. The first coefficient at the top of each column represents the correlation between the composite of all of the written aptitudes and the criterion. The variable column indicates the variables included in computing a given correlation. All variables are included in each calculation EXCEPT the variables above that correlation as well as the variable directly across from that correlation. For example, the second correlation coefficient from the top represents the correlation between the composite, developed using all but the variable across from that coefficient, and the criterion. The multiple correlation coefficient of .140 between the GATB aptitudes and the criterion for the practical nursing group was calculated using all of the aptitudes except aptitudes six and three. The F-values associated with the significance of the multiple correlation coefficients using all of the variables for each group are also reported. None of the multiple correlation coefficients using all of the GATB variables were significantly

different from zero at the .05 level of significance. An examination of the order in which the variables were dropped for each group tends to indicate that the ability of different GATB variables to contribute to predicting graduation versus dropping out changes from curriculum area to curriculum area.

TABLE X

GATB APTITUDE SCORES AS PREDICTORS OF TRAINING COMPLETION IN FOUR OCCUPATIONAL AREAS

AUTOMOTIVES		WELDING		PRACTICAL NURSING		SECRETARIAL TNG.	
VARIABLE*	R	VARIABLE	R	VARIABLE	R	VARIABLE	R
All Var.	.197	All Var.	.142	All Var.	.144	All Var.	.135
drop 3	.196	drop 7	.141	drop 6	.144	drop 5	.135
6	.193	3	.137	3	.140	2	.135
1	.183	1	.134	7	.130	4	.134
2	.177	6	.122	2	.115	1	.129
7	.163	5	.116	1	.108	7	.121
5	.083	4	.106	4	.104	6	.107
4		2		5		3	
F = 1.75		F = .43		F = .81		F = 1.00	

$F_{\alpha} = .05 = 2.01$ *Variables are identified in Table IX

The Minnesota Vocational Interest Inventory

The ability of the raw scores obtained from the MVII homogeneous keys to differentiate graduates and drop-outs was investigated in the same way as were the GATB aptitude scales. Table XI reports the zero-order correlations between each of the nine MVII scales and the criterion for each group. Three of the zero-order correlations were significant at the .05 level. "Mechanical" and "food service" were significant within the secretarial group and "sales-office" was significant for the automotive group.

Table XII reports the multiple correlations between the MVII homogeneous key scores and the criterion for each of the four groups in the same way as the data were reported for the GATB.

TABLE XI

SCORE ZERO ORDER CORRELATIONS BETWEEN
MVII SCALES AND CRITERION

	AUTO.	WELD.	PRAC. NURS.	SEC.
1. Mechanical	.054	-.041	.081	*-.098
2. Health Service	-.080	-.084	.028	.042
3. Office Work	-.087	.038	-.044	-.023
4. Electronics	.017	-.087	-.006	.010
5. Food Service	-.068	.006	.044	*.156
6. Carpentry	-.026	.030	.055	-.025
7. Sales, Office	*-.112	.029	-.057	.011
8. Clean Hands	.030	.050	-.091	-.041
9. Outdoors	.004	.016	.012	.036

*Significant at the .05 level

TABLE XII

MVII HOMOGENEOUS KEYS AS PREDICTORS OF TRAINING
SUCCESS IN FOUR OCCUPATIONAL AREAS

AUTOMOTIVES		WELDING		PRACTICAL NURSING		SECRETARIAL TNG.	
VARIABLE*	R	VARIABLE	R	VARIABLE	R	VARIABLE	R
All Var.	.196	All Var.	.190	All Var.	.148	All Var.	.200
drop 1	.194	drop 3	.190	drop 4	.148	drop 3	.200
5	.189	7	.189	3	.147	7	.200
9	.183	8	.188	6	.145	8	.199
2	.176	5	.187	5	.142	6	.197
4	.160	9	.174	9	.136	2	.194
6	.155	1	.167	2	.132	4	.183
3	.133	6	.136	1	.119	9	.169
8	.113	2	.087	7	.091	1	.155
7		4		8		5	
F = 1.32		F = .60		F = .66		F = 1.81	

$F_{\alpha} = .05 = 1.88$ *Variables identified in Table XI

As with the GATB, the multiple correlations between the composites based on all of the MVII homogeneous keys and the criterion were all non-significant at the .05 level. Also, the importance of each key in predicting the criterion

varied depending upon the curriculum area as indicated by the order in which the variables dropped out.

The Sixteen Personality Factor Questionnaire

The ability of the 16 PF to differentiate graduates from drop-outs from each of the four programs was investigated using the procedures described in the section on the GATB. Table XIII summarizes the zero-order correlations between each of the 16 PF scales and the criterion for each of the four groups. A total of six zero-order correlations were significantly different than zero at the .05 level. Scale E was significant within the practical nursing group, H and I were significant within the secretarial group, and scales A, F and H were significant within the automotive group.

TABLE XIII

ZERO ORDER CORRELATIONS BETWEEN
16 PF SCALES AND CRITERION

	VARIABLE	AUTO.	WELD.	PRAC. NURS.	SEC.
1.	A-Aloof vs. Outgoing	*-.131	.002	-.096	.003
2.	B-Dull vs. Bright	.059	-.054	-.054	.091
3.	C-Emotional vs. Mature	-.051	.081	.004	.018
4.	E-Submissive vs. Dominant	-.053	-.038	*-.129	-.072
5.	F-Glum vs. Enthusiastic	*-.158	.002	-.053	-.026
6.	G-Casual vs. Conscientious	.095	-.051	-.019	.007
7.	H-Timid vs. Adventurous	*-.126	.112	-.096	*-.107
8.	I-Tough vs. Sensitive	-.038	-.075	-.054	*.134
9.	L-Trustful vs. Suspecting	.059	-.010	.011	-.053
10.	M-Conventional vs. Eccentric	.092	-.044	-.011	.056
11.	N-Simple vs. Sophisticated	.030	.004	.056	.056
12.	O-Confident vs. Insecure	.046	.033	.004	.026
13.	Q1-Conservative vs. Experimenting	-.054	-.093	-.014	-.036
14.	Q2-Dependent vs. Self-Sufficient	.071	.011	-.065	-.093
15.	Q3-Uncontrolled vs. Self-Controlled	.040	-.074	-.059	-.052
16.	Q4-Stable vs. Tense	-.039	.023	.026	.070

*Significant at the .05 level

Table XIV summarizes the multiple correlations between the composites derived from the combinations of scales of the 16 PF and the criterion for each of the four groups. In all but one of the four cases, the multiple correlation coefficient based upon all of the variables were non-significant. The multiple correlation coefficient based on all of the 16 PF variables was significant at the .05 level for the automotives group. Again, as was true for the GATB and the MVII, the order in which the variables were dropped varied considerably from one group to another indicating that the value of each variable in predicting the criterion varied from one group to another.

TABLE XIV

16 PF SCALES AS PREDICTORS OF TRAINING SUCCESS IN FOUR OCCUPATIONAL AREAS

AUTOMOTIVES		WELDING		PRACTICAL NURSING		SECRETARIAL TNG.	
VARIABLE*	R	VARIABLE	R	VARIABLE	R	VARIABLE	R
All Var.	.299	All Var.	.255	All Var.	.232	All Var.	.254
drop 4	.299	drop 5	.254	drop 16	.232	drop 6	.254
12	.297	10	.254	10	.232	12	.254
9	.295	9	.253	9	.232	15	.253
8	.292	8	.252	5	.232	5	.253
14	.289	6	.249	12	.231	1	.252
13	.284	1	.248	13	.230	13	.252
2	.278	12	.245	3	.229	16	.249
11	.271	11	.242	15	.226	10	.241
15	.264	4	.234	2	.223	9	.234
3	.255	16	.225	7	.215	4	.223
16	.246	3	.216	8	.205	2	.212
7	.238	14	.206	14	.194	11	.199
10	.217	2	.193	6	.183	3	.189
1	.193	13	.157	1	.156	14	.169
6	.158	15	.112	11	.129	7	.134
5		7		4		8	
F = 1.81*		F = .61		F = .93		F = 1.64	

$F_{.05}$ = 1.67 *Variables identified in Table XIII

The Minnesota Importance Questionnaire

The ability of the thirty scales of the MIQ to differentiate graduates from drop-outs from each of the four programs was investigated in the same way as was the GATB. Table XV summarizes the zero-order correlations between each of the thirty scales and the criterion for each of the four groups.

TABLE XV

ZERO ORDER CORRELATION BETWEEN
MIQ SCALES AND CRITERION

		AUTO.	WELD.	PRAC. NURS.	SEC.
1.	Ability Utilization	*-.125	*.157	.019	.062
2.	Achievement	-.049	.069	-.015	.025
3.	Activity	-.020	.121	.014	.008
4.	Advancement	.000	.103	-.081	.051
5.	Authority	-.037	-.060	-.051	*.149
6.	Company Practices and Policies	.032	.124	-.081	-.015
7.	Compensation I	-.010	.133	-.059	.028
8.	Co-Workers	-.027	.097	.029	*.119
9.	Creativity	-.085	.051	-.067	*.175
10.	Independence	-.018	-.092	-.102	*.100
11.	Moral Value	-.012	-.001	.009	-.039
12.	Recognition	.006	.140	-.025	.037
13.	Responsibility	-.039	-.013	-.051	.094
14.	Security	.031	.045	.089	-.017
15.	Social Service	-.099	-.113	.091	.014
16.	Social Status	-.038	.030	.024	.036
17.	Supervision (Human Relations)	.021	.022	-.025	.034
18.	Supervision (Technical)	.000	.027	-.100	.011
19.	Variety	-.085	.037	-.051	*.099
20.	Working Conditions	.006	.105	-.033	-.002
21.	Work Challenge	-.108	.157	-.071	.079
22.	Company Image	.049	.130	-.066	-.002
23.	Organization Control	-.033	.022	-.063	*.189
24.	Feedback	*-.113	.059	-.107	-.042
25.	Physical Facilities	.019	.084	-.074	.018
26.	Work Relevance	-.085	.067	.016	.010
27.	Company Prestige	*-.177	.114	.020	.051
28.	Company Goals	-.023	.012	-.066	.040
29.	Closure	-.093	.113	-.044	.019
30.	Compensation II	-.013	*.249	-.026	.005

*Significant at the .05 level

TABLE XVI

MIQ SCALES AS PREDICTORS OF TRAINING SUCCESS IN FOUR OCCUPATIONAL AREAS

AUTOMOTIVES		WELDING		PRACTICAL NURSING		SECRETARIAL TNG.	
VARIABLE*	R	VARIABLE	R	VARIABLE	R	VARIABLE	R
All Var.	.371	All Var.	.475	All Var.	.311	All Var.	.315
drop 26	.371	drop 4	.475	drop 23	.311	drop 19	.315
16	.371	13	.475	21	.311	10	.315
6	.371	23	.475	29	.311	20	.314
11	.370	11	.475	5	.311	29	.314
5	.370	8	.475	11	.311	15	.314
14	.370	9	.475	13	.310	2	.313
7	.370	22	.475	20	.310	27	.313
28	.369	27	.474	4	.310	26	.312
18	.368	5	.472	27	.310	6	.312
13	.367	16	.471	9	.310	12	.311
2	.366	24	.470	12	.310	7	.309
9	.364	18	.467	3	.304	30	.309
23	.363	19	.465	8	.302	17	.307
30	.362	26	.462	19	.300	18	.306
8	.360	25	.460	1	.298	28	.304
15	.358	20	.458	30	.295	22	.302
17	.356	2	.454	25	.292	1	.299
20	.353	7	.449	2	.288	11	.296
29	.347	14	.441	6	.283	13	.292
10	.343	3	.434	15	.277	9	.288
19	.338	1	.419	17	.268	3	.281
3	.330	28	.400	18	.259	4	.276
1	.319	6	.388	7	.246	14	.271
25	.312	29	.374	16	.233	16	.261
4	.303	21	.352	22	.219	21	.257
24	.276	17	.334	10	.197	25	.248
12	.260	10	.307	28	.169	5	.235
21	.238	12	.286	26	.155	8	.212
22	.177	15	.249	14	.107	24	.189
27		30		24		23	
F = 1.47*		F = 1.23		F = .88		F = 1.34	

$F_{.05}$ = .05 = 1.46 *Variables identified in Table XV

A total of eleven zero-order correlations were found to be significant at the .05 level of significance. The scales were authority, co-workers, creativity, independence, variety and organizational control within the secretarial training group, ability utilization, feedback and company prestige within the automotives

group, and ability utilization and compensation II within the welding group.

Table XVI summarizes the multiple correlations obtained between the composites derived from combinations of the MIQ scales and the criterion for each of the four groups. The only significant multiple correlation coefficient, at the .05 level, between the composite derived from all of the MIQ scales and the criterion was associated with the automotives group. As was true with the other instruments, the order in which the scales were dropped for each of the four groups was quite different indicating that the relative importance of a given variable changes from group to group.

The Vocational Development Inventory

Since the VDI has only one scale, the only calculations made were zero-order correlations between the single score and the criterion for each of the four groups. Table XVII reports these zero-order correlations. None of the zero-order correlations were significant, indicating that the VDI was not an effective predictor of graduation versus dropping out of any of the four curriculum areas studied.

TABLE XVII

THE VDI AS A PREDICTOR OF TRAINING SUCCESS IN FOUR OCCUPATIONAL AREAS

CURRICULUM	R
Automotives	.042
Welding	.040
Practical Nursing	.088
Secretarial Training	.018

The Minnesota Scholastic Aptitude Test

The MSAT, like the VDI, has only one scale. Therefore, the only calculations performed were zero-order correlations between the single score and the

criterion for each of the four groups. The correlations are reported in Table XVIII. None of the correlations were significant. It is interesting to note, however, that in three of the four cases the correlations between the criterion and the MSAT scores were negative, indicating that persons with higher MSAT scores had more of a tendency to drop than those with lower scores.

TABLE XVIII

THE MSAT AS A PREDICTOR OF TRAINING SUCCESS IN FOUR OCCUPATIONAL AREAS

CURRICULUM	R
Automotives	-.045
Welding	-.034
Practical Nursing	-.050
Secretarial Training	.084

Summary PART II

A sample of four curriculum areas, two primarily male (automotives, welding) and two primarily female (practical nursing, secretarial) were selected for an investigation of how well the Project MINI-SCORE instruments discriminate graduates from drop-outs of vocational-technical curricula. Zero-order correlations were calculated between each scale of each instrument and the criterion to determine how well each separate scale could predict the criterion. Step-wise multiple correlations was used to determine how well all of the scales in each instrument as well as sub-sets of the scales could predict the criterion.

An examination of the zero-order correlations indicated that a number of the scales of each of the multi-scale instruments correlated significantly with the criterion within at least one of the four curriculum areas while each of the single scale instruments did not. An examination of the multiple correlation coefficients revealed that only two were significant at the .05 level. The

equation predicting the criterion using the 16 PF scales, and the equation predicting the criterion using the MIQ scales for the automotives group produced significant multiple correlations.

The results of this study indicate that the graduates and the drop-outs from each of the four curriculum areas studied are quite similar on the dimensions measured by the Project MINI-SCORE test battery. However, this finding is not unexpected. The vocational schools pre-selected the students who enrolled in the curricula studied. This pre-selection tends to make the students in a given vocational program quite homogeneous, minimizing chances of detecting differences between those who graduate and those who leave the program before graduating. In the case of the automotives curriculum, where the number of drop-outs was relatively high (44 per cent), original selection was not as effective and differences were detected. Another factor which minimized differences was the definition of drop-outs used. The definition included those who were accepted for training and did not show up for training. If that group was removed from the drop-out category larger differences might be found.

These findings do, however, tend to disagree with Project MINI-SCORE centour study results (Pucel, 1969) which indicated much greater differences among drop-outs and graduates from selected programs. The authors feel this discrepancy is due to the fact that the relationship between the predictor variables and the criterion is not linear. Persons will have an increased probability of success in an occupation as their abilities and traits increase up to a point. After that point, they have "too much" of the ability or trait as contrasted with other successful persons in the occupation and their probability of success decreases. The centour methodology is more consistent with this condition than multiple correlation techniques.

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APPENDIX A

DISCUSSION OF THE GATB FINDINGS

The instrument used by Project MINI-SCORE to measure individual aptitudes was the GATB, B-1002, Form B (GATB Manual, Sec. III, 1967). This instrument, one of the most fully developed of the aptitude measurement batteries, is widely used for non-professional level occupational counseling and job placement.

Table I-A presents the curriculum mean scores on each of the seven GATB aptitude scales for the seven male curriculums included in this study. F-values are reported in the last two columns. Table II-A presents similar data for the five female curriculums studied. Each of the scales are discussed in detail below. (Descriptions of the scales have been abstracted from the GATB manual, Section III.)

The GATB was very effective in its ability to distinguish between all four groups of vocational-technical curriculum graduates. All of the scales of the GATB were able to differentiate among both the total and restricted male groups with ANOVA F-values significant at the .01 level. All of the female curriculum ANOVA's were significant at the .01 level except for scales Q and K for the total group, which were significant at the .05 level. Scale K was not significant for the restricted group of female curricula.

G-Intelligence: General learning ability. The ability to "catch on" or understand instructions and underlying principles; the ability to reason and make judgments. Closely related to doing well in school.

For the project MINI-SCORE curriculums studied, the curriculum mean scores ranged from 115.12 for drafting and design to 101.69 for welding.

V-Verbal Aptitude: The ability to understand the meaning of words and to use them effectively. The ability to comprehend language, to understand relationships between words and to understand meanings of whole sentences and paragraphs.

For the male curriculums, the mean scores on this scale ranged from 102.70 for accounting (male) to 92.70 for welding. The female curriculums tended to be

somewhat higher than the male curriculums, with practical nurses having the highest mean score of 107.75.

N-Numerical Aptitude: Ability to perform arithmetic operations quickly and accurately.

The two highest scoring curriculums on this aptitude measure were accounting (female) and accounting (male). Secretarial, and drafting and design were also high. Welding scored lowest. The scores on this scale ranged from a high of 117.36 for the accounting (female) group to a low of 100.30 for the welding group.

S-Spatial Aptitude: Ability to think visually of geometric forms and to comprehend the two-dimensional representation of three-dimensional objects. The ability to recognize the relationships resulting from the movements of objects in space.

Most of the male curriculums scored higher on this dimension than the female curriculums. The highest mean score (125.99) was achieved by the drafting and design curriculum group, the lowest (108.48) was achieved by the clerical group. There was less variability among the female curriculums than among the male curriculums on this aptitude measure.

P-Form Perception: Ability to perceive pertinent detail in objects or in pictorial or graphic material. Ability to make visual comparisons and discriminations and to see slight differences in shapes and shadings in figures and widths and lengths of lines.

Drafting and design was the only male curriculum that scored as high as the lowest female curriculum (clerical). The highest mean score was achieved by cosmetology (130.89) and the lowest was achieved by the welding curriculum (109.80). This was the only GATB scale on which cosmetology was the highest of the five female curriculums, on five of the other six scales, the cosmetology curriculum mean score was either lowest or second lowest.

Q-Clerical Perception: Ability to perceive pertinent detail in verbal or tabular material. Ability to observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation.

The clerical curriculum had the lowest mean score (122.24) among the female curriculums but was still considerably higher than the highest male curriculum

score achieved by the accounting (male) group (118.21). This scale seems to differentiate between the male and female curriculums studied more effectively than any of the other aptitude scales.

K-Motor Coordination: Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed. Ability to make a movement response accurately and swiftly.

Again, all of the female curriculum mean scores were higher than the male scores. The highest scoring curriculum was practical nursing, with a score of 113.42; the lowest scoring was power and home electricity with a score of 87.35. This scale was the least effective of the GATB scales in terms of differentiating among the female curriculums.

TABLE I-A

GATB SCALE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE MALE CURRICULUMS

APTITUDE	Power and Home Electricity	Carpentry	Automotives	Drafting and Design	Machine Shop	Welding	Accounting (Male)	F test (total male group)	F test (without Accounting Male)
G-Intelligence	111.22 (10.17)	107.25 (9.22)	106.29 (13.06)	115.12 (9.89)	107.03 (12.72)	101.69 (12.34)	112.85 (11.84)	15.32**	15.20**
V-Verbal Aptitude	97.58 (9.66)	94.83 (9.07)	95.43 (11.02)	100.99 (10.00)	95.79 (11.05)	92.70 (10.61)	102.70 (10.22)	11.44**	7.07**
N-Numerical Aptitude	107.96 (13.15)	104.74 (12.64)	103.62 (13.84)	114.37 (11.74)	108.13 (12.96)	100.30 (13.38)	115.85 (13.86)	18.80**	13.66**
S-Spatial Aptitude	123.66 (14.63)	120.90 (15.81)	119.61 (17.30)	125.99 (13.20)	115.21 (17.36)	113.93 (17.14)	114.87 (16.22)	7.49**	7.63**
P-Form Perception	116.25 (15.86)	113.81 (13.62)	111.01 (18.61)	121.11 (17.18)	115.39 (16.18)	109.80 (19.17)	118.68 (18.77)	5.66**	5.71**
Q-Clerical Perception	110.18 (10.84)	106.96 (11.05)	109.06 (12.54)	113.99 (11.23)	109.08 (12.54)	107.36 (12.73)	118.21 (13.49)	10.09**	3.98**
K-Motor Coordination	87.35 (39.86)	97.42 (16.84)	97.38 (18.77)	105.57 (19.52)	96.42 (17.33)	97.28 (17.66)	102.83 (19.19)	5.60**	5.50**

NOTE: Standard Deviations in parentheses
*Significant at .05
**Significant at .01

TABLE II-A

GATB SCALE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE FEMALE CURRICULUMS

APTITUDE	Practical Nursing	Cosmetology	Clerical	Secretarial	Accounting (Female)	F test (total female group)	F test (without Practical Nursing)
G-Intelligence	111.78 (11.39)	105.73 (11.80)	105.90 (11.48)	112.96 (11.60)	112.34 (12.17)	18.69**	22.55**
V-Verbal Aptitude	107.75 (11.29)	100.58 (11.21)	101.25 (10.13)	107.31 (11.29)	103.20 (10.79)	19.50**	18.78**
N-Numerical Aptitude	111.11 (12.53)	104.91 (11.70)	108.91 (11.76)	115.12 (12.90)	117.36 (12.65)	23.08**	30.67**
S-Spatial Aptitude	113.61 (16.86)	113.05 (16.03)	108.48 (16.78)	112.05 (15.43)	113.98 (16.50)	3.69**	3.85**
P-Form Perception	125.92 (17.97)	130.89 (17.99)	119.98 (15.74)	124.76 (17.17)	123.47 (17.89)	8.47**	10.95**
Q-Clerical Perception	125.08 (15.22)	123.31 (13.66)	122.24 (14.36)	126.48 (14.03)	124.71 (15.10)	3.15*	4.26**
K-Motor Coordination	113.42 (15.75)	107.16 (20.71)	105.91 (27.55)	108.68 (35.39)	110.48 (19.35)	2.70*	.68

NOTE: Standard Deviations in parentheses
*Significant at .05
**Significant at .01

APPENDIX B

THE MINNESOTA VOCATIONAL INTEREST INVENTORY (MVII)

The assessment of the vocational interests of the Project MINI-SCORE subjects was accomplished using the MVII (Clark and Campbell, 1965). This instrument, developed by Clark, is designed particularly for non-professional groups. The nine "Homogeneous Keys" were derived by identifying clusters of inventory items that correlated highly with each other. These keys may be viewed as nine factors underlying interest as measured by the MVII.

The results of the ANOVA tests of raw score differences among curriculums along with the individual curriculum mean scores and standard deviations, are reported in Table I-B for the male curriculums and Table II-B for the female curriculums. An examination of the relative size of the means and standard deviations indicated that as the mean raw scores got very low, the standard deviations approached or exceeded the size of the means. This finding appears to indicate that the range on these scales is restricted causing the distributions to be highly skewed. Due to the highly skewed MVII score distributions chi-square analyses were run as well as ANOVA analyses to determine if non-parametric test results would agree with the parametric tests results. The results of the two methods agreed for 33 of the 36 tests. Discrepancies were discovered in the H-9 restricted males analysis and the H-4 and H-9 restricted females analyses. Only the ANOVA results are presented. Each of the nine homogeneous scales are discussed below.

H-1: Mechanical Indicates interests in mechanical things, machine operation and design, or about home repairs of mechanical and simple electrical gadgets.

For males, the differences between curriculums were significant at the .01 level. The accounting (male) curriculum scored only about one-third as high on this factor as did the other male curriculums. The highest scoring male group was automotives with a mean score of 16.89. With the accounting (male) curriculum

removed, the differences were still significant at the .01 level. For the female curriculums, the differences were significant with or without practical nursing at the .01 level. The scores were very low for all the female curriculums and in all cases the standard deviation was greater than the mean indicating that the distributions were highly skewed. The lowest scoring female curriculum group was secretarial training with a mean score of .76.

H-2: Health Service Expresses interests in medical and hospital services, activities and occupations or in working in medical, biological or chemical laboratories.

All ANOVA tests of both the male and female groups were significant at the .01 level. Males scored lower than females in all cases. The mean scores ranged from 15.65 for the practical nursing group to 2.36 for the automotives group. Practical nursing, the only health-oriented curriculum, scored nearly twice as high as any other curriculum.

H-3: Office Work Indicates interests in general clerical work and office machine operations, bookkeeping and accounting, and office management practices.

The accounting (male) group scored about five times as high as the rest of the male curriculums. The three office-related female curriculums--secretarial, clerical, and accounting (female)--scored high. Mean scores ranged from a high of 15.09 for the accounting (female) group to a low of 2.17 for the automotives group. The total male group ANOVA and both of the female group tests were significant at the .01 level.

H-4: Electronics This key expresses an interest in the maintenance, operation and construction of electronic equipment, and the repair and construction of electrical systems and devices.

The power and home electricity group was considerably higher (13.07) than any of the other curriculums, with accounting (male) the lowest of the male curriculums followed by all of the female curriculums. The curriculum group with the lowest mean score was practical nursing (1.58). Both of the male and the

total female group tests were significant at the .01 level. The female group test with practical nursing removed was significant at the .05 level.

H-5: Food Service Indicates interests in the preparation of food and menu planning.

This dimension did not significantly discriminate the male curriculums included in this study. However, none of the curriculum areas in this study related particularly to foods. There were significant differences among the female curricula; practical nursing and cosmetology were somewhat higher than the office-oriented curriculums. Both with and without the practical nursing group included, the female groups were significantly different at the .01 level. The mean scores ranged from 10.39 for the practical nursing group to 3.66 for the machine shop group.

H-6: Carpentry This cluster deals primarily with interests relating to carpentry, cabinet making and furniture construction.

The carpentry curriculum was highest (11.28) and the power and home electricity curriculum was lowest (4.34) with the remaining male and female curriculums falling between these two extremes. All ANOVA tests were significant at the .01 level.

H-7: Sales-Office Two clusters of interests are indicated here. The larger deals with a variety of verbal activities, while the other relates to aesthetic interests.

All of the male curriculum mean scores were lower than those of the female curriculums. The lowest mean score was obtained by the automotives group (1.81). The highest female curriculum was practical nursing (8.17). All of the tests were significant at the .01 level, except the female curriculum group without practical nursing which was not significant at the .05 level.

H-8: Clean Hands Indicates an interest in those occupations which possess "clean hands" kinds of activities.

The accounting (male) group scored slightly higher (6.73) on this dimension of interest than did any of the female curriculums. However, the rest of the

male curriculums were lower than any of the female curriculums with automotives being the lowest (3.07). Practical nursing scored the lowest of the female curriculums. With the accounting (male) group removed there were no significant differences among the male groups, but all of the remaining tests were significant at the .01 level.

H-9: Outdoors This key reflects an interest in athletics and other outdoor activities.

All the male curriculums scored higher than did any of the female curriculums with machine shop scoring highest (9.94). Both the total male and the total female curriculum group tests were significant at the .01 level. The restricted group of male curriculums test was significant at the .05 level and the restricted female group ANOVA was not significant.

TABLE I-B

MVII SCALE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE MALE CURRICULUMS

	Power and Home Electricity	Carpentry	Automotives	Drafting and Design	Machine Shop	Welding	Accounting (Male)	F test (total male group)	F test (without Accounting Male)
H-1 Mechanical	15.80 (4.36)	15.07 (4.25)	16.89 (4.04)	14.92 (4.29)	16.62 (4.00)	15.74 (4.78)	5.52 (4.04)	83.17**	3.68**
H-2 Health Service	3.60 (3.03)	2.70 (2.61)	2.36 (2.37)	3.86 (3.11)	2.77 (3.12)	2.96 (2.56)	2.79 (2.63)	3.92**	4.60**
H-3 Office Work	2.58 (2.12)	3.00 (2.87)	2.17 (2.64)	2.95 (2.73)	2.56 (2.78)	2.54 (2.68)	14.25 (3.78)	227.24**	1.51
H-4 Electronics	13.07 (2.91)	6.68 (2.70)	9.48 (3.45)	8.22 (3.57)	8.07 (2.92)	7.96 (3.24)	4.71 (3.20)	52.13**	35.61**
H-5 Food Service	4.17 (2.48)	3.91 (2.74)	4.04 (2.69)	4.37 (2.99)	3.66 (2.58)	4.72 (3.25)	3.99 (3.24)	1.34	1.61
H-6 Carpentry	4.34 (2.27)	11.28 (2.75)	6.87 (3.06)	8.06 (3.10)	8.51 (2.66)	7.91 (3.13)	6.82 (2.83)	38.00**	43.87**
H-7 Sales-Office	2.69 (2.11)	2.12 (1.92)	1.81 (1.97)	3.68 (2.50)	2.07 (1.97)	2.44 (2.05)	4.62 (2.66)	21.93**	10.49**
H-8 Clean Hands	3.41 (2.20)	3.52 (1.90)	3.07 (1.83)	3.77 (1.83)	3.54 (1.98)	3.37 (2.06)	6.73 (2.34)	38.11**	1.75
H-9 Outdoors	9.13 (2.47)	9.74 (2.34)	9.42 (2.38)	8.75 (2.19)	9.94 (2.17)	9.20 (2.37)	5.79 (1.85)	34.63**	2.77*

NOTE: Standard Deviations in parentheses
*Significant at .05
**Significant at .01

TABLE II-B

MVII SCALE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE FEMALE CURRICULUMS

	Practical Nursing	Cosmetology	Clerical	Secretarial	Accounting (Female)	F test (total female group)	F test (without Practical Nursing)
H-1 Mechanical	1.08 (1.63)	1.75 (2.71)	1.48 (2.50)	.76 (1.62)	1.72 (2.76)	8.14**	9.18**
H-2 Health Service	15.65 (2.40)	8.00 (4.32)	6.22 (4.27)	7.44 (4.65)	5.16 (4.18)	237.67**	10.76**
H-3 Office Work	5.83 (3.40)	9.71 (4.36)	14.25 (3.86)	13.95 (4.22)	15.09 (4.12)	214.86**	42.26**
H-4 Electronics	1.58 (1.42)	2.73 (1.97)	2.86 (1.70)	2.38 (1.73)	2.52 (1.65)	20.69**	3.62*
H-5 Food Service	10.39 (3.44)	10.23 (3.72)	8.23 (3.08)	8.51 (3.40)	8.66 (3.70)	18.82**	9.89**
H-6 Carpentry	5.34 (2.14)	6.10 (2.34)	5.40 (2.26)	5.54 (2.34)	5.82 (2.37)	3.38**	3.87**
H-7 Sales-Office	8.17 (2.77)	6.18 (2.65)	5.76 (2.72)	6.35 (2.56)	5.95 (2.72)	30.40**	2.33
H-8 Clean Hands	4.29 (1.87)	5.28 (1.72)	6.51 (2.14)	6.13 (2.02)	6.25 (2.13)	48.13**	9.74**
H-9 Outdoors	4.00 (2.00)	3.82 (2.10)	3.57 (1.98)	3.34 (1.79)	3.30 (1.90)	5.22**	2.34

NOTE: Standard Deviations in parentheses
*Significant at .05
**Significant at .01

APPENDIX C

THE SIXTEEN PERSONALITY FACTOR QUESTIONNAIRE (16 PF)

The instrument employed to measure the personality characteristics of subjects in Project MINI-SCORE was the 16 PF (16 PF Handbook, 1962). This questionnaire, developed by R.B. Cattell and others, is available in long forms A and B, or in short form C. Form C was used in the Project MINI-SCORE study. The individual curriculum mean scores and standard deviations, as well as ANOVA F-values, are reported for the male curriculums in Table I-C and for the female curriculums in Table II-C. The individual scales are discussed below.

Factor A-Aloof vs. Outgoing: A low score indicates a tendency to be stiff, cool, aloof. This person likes things rather than people, and working alone. A high score indicates a person who is good-natured, easy-going, cooperative and attentive to people.

The one-way ANOVA for this dimension with all seven male curriculums yielded a significant F-value at the .01 level. However, with the accounting (male) group removed, the test was non-significant. For females the F-value was significant at the .01 level both with and without practical nursing. All female curriculums scored higher on this factor than the males, with carpentry the lowest curriculum, practical nursing the highest.

Factor B-Dull vs. Bright: A low score indicates slowness to learn and grasp, sluggish. A high score tends to indicate a person quick to grasp ideas, a fast learner, intelligent, usually rather cultured.

The ANOVA tests of this factor were significant at the .01 level for all four groups. The lowest score was achieved by the welding curriculum, the highest by drafting and design.

Factor C-Emotional vs. Mature: A person with a low score tends to be emotionally immature, easily frustrated, easily annoyed, and generally dissatisfied. A person with a high score tends to be stable, calm, realistic about life.

This factor was not able to differentiate most groups. The exception was the total group of female curriculums, significant at the .01 level.

Factor E-Submissive vs. Dominant: A low score indicates a person who is dependent, a follower, often soft-hearted and easily upset. A high scorer tends to be self-assured, assertive, stern and authoritarian.

This scale was not able to differentiate groups. It is interesting to note, however, that the female curriculums tended to score about one point lower than the male curriculums.

Factor F-Glum vs. Enthusiastic: A person with a low score tends to be taciturn, reticent, introspective. A person with a high score tends to be cheerful, frank, quick, alert.

This factor was significant at the .05 level for the total group of female curriculums, but not for the other group comparisons. The female curriculums tended to be higher on this factor than the male curriculums.

Factor G-Casual vs. Conscientious: A low scorer tends to be fickle, unsteady, perhaps impatient and obstructive. A high scorer tends to be strong in character, responsible, and well organized.

There were no significant results. However, all of the female curriculums were somewhat higher on this factor than the male curriculums.

Factor H-Timid vs. Adventurous: A low scorer tends to be shy, cautious, cool, with inferiority feelings. A high scorer tends to be sociable, spontaneous, but perhaps careless of detail.

This scale was able to differentiate the total group of female curricula at the .01 level, primarily because practical nursing was somewhat higher than all of the other curriculums. The lowest of all the curriculums was clerical. The tests of the differences within the restricted female group and within both male groups were non-significant.

Factor I-Tough vs. Sensitive: A person who scores low tends to be practical, masculine, independent, "uncultured", sometimes cynical, smug. A person scoring high may be tender-minded, artistic, fastidious, excitable, perhaps dependent and impractical.

This scale was effective in differentiating within each of the curriculum groups at the .05 level or above except for the restricted male group. As expected, the male curriculums scored low, and the female curriculums high. The secretarial group scored highest and the carpentry group scored lowest.

Factor L-Trustful vs. Suspecting: The low scorer tends to be free of jealous tendencies, adaptable, cheerful, composed. A high scorer tends to be mistrusting and doubtful, self-opinionated, a poor team member.

The total female curriculum group analysis yielded a significant F-value at the .05 level. None of the other analyses were significant. The lowest score was achieved by practical nursing, the highest by drafting and design.

Factor M-Conventional vs. Eccentric: A low scorer tends to be anxious to do the right thing, practical, and conformist, often unimaginative. The high scorer tends to be unconventional, sensitive, imaginative, perhaps undependable and impractical.

All ANOVA F-values on this scale were significant at the .05 level or above. The highest score was secretarial, the lowest was carpentry. The female curriculums tended to be slightly higher on this factor.

Factor N-Simple vs. Sophisticated: A low scorer tends to be unsophisticated, sentimental and simple, perhaps crude. The high scorer tends to be polished, worldly, shrewd.

None of the ANOVA tests were significant for this factor. The female curriculum mean scores were all somewhat lower than t ale curriculum scores.

Factor O-Confident vs. Insecure: A person scoring low tends to be placid, mature, resilient. A high scorer may be moody, a worrier, suspicious.

This factor was able to differentiate among both the total and restricted groups of male curriculums at the .05 level or above, but was not able to differentiate among the female curriculums. Scores for the male and for the female curriculums were not consistently different.

Factor Q1-Conservative vs. Experimenting: A low scorer tends to be overly cautious and moderate. A high scorer tends to be interested in intellectual matters and issues, and tends to experiment in life generally.

Both the total male and the total female ANOVA F-values were significant at the .01 level. The two lowest curriculums were accounting (male) and accounting (female) and the highest was practical nursing.

Factor Q2-Dependent vs. Self-Sufficient: A low scorer tends to work and make decisions with other people, lacking in resolute. A high scorer tends to be independent and resolute although not necessarily dominant.

This scale differentiated curriculums within both the total male and female curriculum groups at the .05 level, but not the restricted groups. The male curriculum groups all scored higher than the female curriculum groups with the automotives and power and home electricity groups scoring highest and the clerical group the lowest.

Factor Q-3-Uncontrolled vs. Self-Controlled: The person who scores low tends to lack will control and character stability. The high scoring person tends to have strong control over his emotions and behavior, but may be obstinate.

Both of the female group tests were significant at the .05 level or above, with the practical nursing group obtaining the highest score and the clerical group the lowest. The male and female curriculums scored within the same range.

Factor Q4-Stable vs. Tense: The low scorer tends to be calm, relaxed, composed and satisfied. The high scorer tends to be excitable, restless, fretful, impatient.

Only the test of the total group of female curriculums had a significant F-value at the .05 level, with practical nursing having the lowest score of the female curriculums. Except for practical nursing, all of the female curriculums were higher on this factor than the male curriculums.

TABLE I-C

16 PERSONALITY FACTORS QUESTIONNAIRE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE MALE CURRICULUMS

	Power and Home Electricity	Carpentry	Automotives	Drafting and Design	Machine Shop	Welding	Accounting (Male)	F test (total male group)	F test (without Accounting Male)
A-Aloof vs. Outgoing	5.62 (2.24)	4.86 (2.07)	5.26 (1.83)	5.12 (2.36)	5.37 (2.08)	5.18 (2.25)	6.61 (2.18)	6.46**	1.05
B-Dull vs. Bright	3.63 (1.27)	3.70 (1.35)	3.79 (1.29)	4.55 (1.22)	3.92 (1.50)	3.38 (1.47)	4.12 (1.35)	7.48**	8.16**
C-Emotional vs. Mature	7.70 (2.16)	7.20 (2.21)	7.13 (2.24)	6.97 (2.27)	7.13 (2.24)	7.36 (2.13)	6.99 (2.58)	1.01	1.09
E-Submissive vs. Dominant	4.49 (2.22)	4.02 (2.05)	4.39 (2.10)	4.48 (2.24)	4.30 (2.21)	4.32 (2.29)	4.51 (2.29)	.44	.45
F-Glum vs. Enthusiastic	6.72 (2.47)	6.48 (2.76)	6.23 (2.45)	6.93 (2.53)	6.31 (2.80)	6.38 (2.77)	6.71 (2.48)	1.01	1.06
G-Casual vs. Conscientious	6.65 (2.06)	6.72 (2.06)	6.98 (2.13)	6.55 (2.31)	6.38 (2.12)	6.46 (2.23)	6.49 (2.14)	1.11	1.21
H-Timid vs. Adventurous	5.54 (2.15)	5.75 (2.13)	5.29 (2.04)	5.91 (2.27)	5.52 (2.18)	5.79 (2.08)	5.84 (2.23)	1.34	1.42
I-Tough vs. Sensitive	2.99 (2.08)	2.84 (1.81)	2.87 (1.87)	2.94 (1.89)	2.98 (1.99)	2.86 (1.60)	3.87 (2.24)	3.45**	.10
L-Trustful vs. Suspecting	4.94 (2.06)	5.32 (1.93)	5.58 (1.94)	5.62 (2.19)	5.37 (2.02)	5.17 (2.03)	5.40 (2.16)	1.23	1.50
M-Conventional vs. Eccentric	5.68 (2.06)	4.32 (1.87)	5.22 (1.94)	5.36 (1.90)	5.15 (2.19)	4.92 (1.86)	5.26 (1.95)	3.45**	4.06**
N-Simple vs. Sophisticated	4.79 (1.74)	5.04 (1.79)	5.30 (1.67)	5.15 (1.95)	4.80 (2.10)	5.16 (2.16)	5.14 (2.02)	.97	1.18
O-Confident vs. Insecure	3.87 (1.82)	4.32 (1.92)	4.75 (1.89)	4.12 (1.78)	4.28 (2.22)	4.58 (2.20)	3.99 (1.91)	2.89**	2.73*

TABLE I-C

16 PERSONALITY FACTORS QUESTIONNAIRE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE MALE CURRICULUMS

	Power and Home Electricity	Carpentry	Automotives	Drafting and Design	Machine Shop	Welding	Accounting (Male)	F test (total male group)	F test (without Accounting Male)
Q1-Conservative vs. Experimenting	4.69 (2.19)	4.07 (2.04)	4.50 (1.89)	4.82 (2.30)	4.03 (1.95)	4.37 (2.06)	3.82 (2.10)	2.81**	1.92
Q2-Dependent vs. Self-Sufficient	7.65 (1.68)	7.74 (2.01)	7.65 (1.70)	7.41 (1.88)	6.92 (1.91)	7.46 (1.74)	7.06 (1.96)	2.50*	2.16
Q3-Uncontrolled vs. Self-Controlled	6.84 (2.27)	6.80 (2.44)	6.80 (2.19)	6.42 (2.31)	6.34 (2.42)	6.60 (2.23)	6.48 (2.36)	.70	.76
Q4-Stable vs. Tense	5.04 (1.92)	5.45 (2.10)	5.32 (2.22)	5.77 (2.12)	5.83 (2.12)	5.70 (2.28)	5.46 (2.51)	1.37	1.71

NOTE: Standard Deviations in parentheses
*Significant at .05
**Significant at .01

TABLE II-C

16 PERSONALITY FACTORS QUESTIONNAIRE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE FEMALE CURRICULUMS

	Practical Nursing	Cosmetology	Clerical	Secretarial	Accounting (Female)	F test (total female group)	F test (without Practical Nursing)
A-Aloof vs. Outgoing	8.21 (2.06)	7.51 (2.37)	7.02 (1.87)	7.56 (1.96)	6.74 (2.12)	14.28**	6.13**
B-Dull vs. Bright	4.30 (1.37)	3.82 (1.45)	3.87 (1.35)	4.22 (1.40)	4.02 (1.29)	4.73**	3.91**
C-Emotional vs. Mature	7.49 (2.32)	6.88 (2.01)	6.76 (2.20)	7.02 (2.21)	7.25 (1.93)	3.83**	1.36
E-Submissive vs. Dominant	3.39 (2.23)	3.62 (2.03)	3.31 (2.24)	3.39 (2.07)	3.38 (2.03)	.44	.61
F-Glum vs. Enthusiastic	7.50 (2.38)	7.27 (2.58)	6.72 (2.43)	7.08 (2.38)	6.90 (2.40)	3.41**	1.62
G-Casual vs. Conscientious	7.43 (1.88)	7.36 (2.04)	7.56 (1.83)	7.52 (2.14)	7.85 (1.87)	1.03	1.13
H-Timid vs. Adventurous	6.21 (2.26)	5.26 (1.99)	5.05 (2.07)	5.41 (2.11)	5.25 (2.19)	10.35**	1.31
I-Tough vs. Sensitive	7.16 (2.29)	7.33 (2.09)	7.23 (2.10)	7.65 (2.00)	6.91 (2.34)	3.25*	3.84**
L-Trustful vs. Suspecting	4.86 (2.03)	5.36 (1.90)	5.45 (1.78)	5.24 (2.07)	5.24 (1.96)	3.04*	.58
M-Conventional vs. Eccentric	5.58 (1.89)	5.68 (1.73)	5.53 (1.86)	5.94 (1.87)	5.44 (1.72)	2.63*	3.20*
N-Simple vs. Sophisticated	4.27 (1.55)	4.60 (1.69)	4.61 (1.94)	4.69 (1.83)	4.54 (1.82)	2.20	.20
O-Confident vs. Insecure	4.58 (1.96)	4.72 (1.97)	4.93 (1.95)	4.92 (2.04)	4.54 (2.02)	1.70	1.16

TABLE II-C

16 PERSONALITY FACTORS QUESTIONNAIRE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE FEMALE CURRICULUMS

	Practical Nursing	Cosmetology	Clerical	Secretarial	Accounting (Female)	F test (total female group)	F test (without Practical Nursing)
Q1-Conservative vs. Experimenting	4.88 (2.38)	4.24 (2.06)	3.93 (1.92)	3.95 (2.14)	3.72 (1.98)	9.74**	1.22
Q2-Dependent vs. Self-Sufficient	6.84 (1.61)	6.62 (1.71)	6.40 (1.52)	6.47 (1.56)	6.77 (1.80)	3.14*	1.50
Q3-Uncontrolled vs. Self-Controlled	7.10 (2.17)	6.12 (2.55)	5.59 (2.30)	6.01 (2.20)	6.30 (2.34)	14.71**	2.80*
Q4-Stable vs. Tense	5.68 (2.17)	6.74 (1.95)	6.39 (2.24)	6.48 (2.14)	6.58 (2.06)	7.65**	.78

NOTE: Standard Deviations in parentheses
*Significant at .05
**Significant at .01

APPENDIX D

THE MINNESOTA IMPORTANCE QUESTIONNAIRE (MIQ)

The instrument used by Project MINI-SCORE to measure the psychological dimensions of individual job needs was the MIQ (Weiss and others, 1964, 1966), developed by the Work Adjustment Project of the University of Minnesota. The version used by Project MINI-SCORE consisted of 30 scales. Curriculum mean scores and standard deviations, along with F-values for the ANOVA tests, are reported in Table I-D for the male curriculums and in Table II-D for the female curriculums. Statements which reflect the meaning of each scale are included in the discussions of the first 20 scales. (The last 10 scales of the 30 scale version were somewhat experimental and are not fully reported in the Work Adjustment Project literature.)

Scale 1-Ability Utilization: "I could do something that makes use of my abilities."

This scale significantly differentiated both the total and the restricted groups of female curriculums at the .05 level or above, but not the male groups. The male curriculums were all slightly lower on this dimension of needs than the female groups. The cosmetology group scored highest and the machine shop group scored lowest.

Scale 2-Achievement: "The job could give me a feeling of accomplishment."

The ANOVA F-value was significant at the .01 level for the total group of female curriculums only, with practical nursing highest of all curriculums. Again, the female curriculums were slightly higher than the male curriculums.

Scale 3-Activity: "I could be busy all the time."

Significant F-values were obtained at the .05 level or above for all comparisons but the restricted male group comparison. The lowest curriculum mean value was scored by accounting (male), the highest by cosmetology.

Scale 4-Advancement: "The job would provide an opportunity for advancement."

This scale differentiated between the curriculums within each of the groups at the .01 level except the female restricted group. The highest curriculum was accounting (male), the lowest was practical nursing.

Scale 5-Authority: "I would tell people what to do."

The only significant F-value was for the total female group (.01 level). The male curriculums scored a point or two higher on this scale than did the female curriculum groups.

Scale 6-Company Practices and Policy: "The company would administer its policies fairly."

The only significant F-value was associated with the ANOVA of the total group of female curriculums (.05 level). The female curriculums all scored higher than the male curriculums on this dimension of needs.

Scale 7-Compensation I: "My pay would compare well with that of other workers." (This scale is labeled "Compensation" in the 20 scale version)

Significant differences at the .01 level were found within the total female group, with practical nursing being considerably lower than other curriculums. None of the other comparisons were significant. The male curriculums tended to be higher than the female curriculums.

Scale 8-Co-workers: "My co-workers would be easy to make friends with."

The total female group was again the only comparison to achieve a significant F-value (.01 level). The female curriculums scored higher than the males on this dimension.

Scale 9-Creativity: "I would try out some of my own ideas."

This scale was very effective in differentiating among both the total and restricted groups of female curriculums (.01 level). Cosmetology was the highest

on this scale, and practical nursing, the lowest.

Scale 10-Independence: "I could work alone on the job."

This scale achieved significant ANOVA F-values (.01 level) for all comparisons except the restricted group of female curriculums. The lowest mean score of all the curriculums was obtained by the practical nursing group; the highest score was obtained by the automotives group.

Scale 11-Moral Values: "I could do the work without feeling that it is morally wrong."

The only significant differences were within the total female group (.01 level). The highest score was obtained by the practical nursing group. The male curriculums were all lower than the female curriculums on this scale.

Scale 12-Recognition: "I could get recognition for work I do."

The total female group comparison was significant (.01 level). The only curriculum that differed greatly from the other curriculums was practical nursing, which was low.

Scale 13-Responsibility: "I could make decisions on my own."

This scale was significant for all ANOVA comparisons (at the .05 level or above) except for the restricted group of male curriculums. Practical nursing was the lowest of all curriculums, power and home electricity the highest.

Scale 14-Security: "The job would provide for steady employment."

The total group of male curriculums had a significant ANOVA at the .05 level. Male and female curriculum mean scores were very similar.

Scale 15-Social Service: "I could do things for other people."

This scale yielded significant ANOVA F-values at the .01 level for all four comparisons. All of the female curriculums were higher than the male curriculums.

Practical nursing was the highest scoring curriculum and welding the lowest scoring.

Scale 16-Social Status: "I could be 'somebody' in the community."

This scale differentiated only the total group of female curriculums (.01 level). The male curriculums tended to be higher than the female, with practical nursing the lowest scoring curriculum and carpentry the highest.

Scale 17-Supervision--Human Relations: "My boss would back up his men (with top management)."

None of the comparisons were significant. The male and female curriculums scored similarly.

Scale 18-Supervision--Technical: "My boss would train his men well."

All curriculum mean scores were similar. No ANOVA comparison was significant.

Scale 19-Variety: "I could do something different every day."

All ANOVA comparison yielded significant F-values at the .05 level or above except the restricted group of female curriculums. The lowest scoring of all curriculums was accounting (male); the highest was power and home electricity.

Scale 20-Working Conditions: "The job would have good working conditions."

The only significant result (.01 level) was from the total group of female curriculums, with practical nursing being the lowest of all curriculums.

Scale 21-Work Challenge

The only significant ANOVA was associated with the total group of female curriculums (.01 level). All of the male curriculums scored higher than the female curriculums.

Scale 22-Company Image

The analyses of both the total group of female curriculums and the total group of male curriculums yielded significant results (.05 level). Males tended to score lower than females. The highest scoring curriculum was clerical and the lowest was machine shop.

Scale 23-Organizational Control

All comparisons but the restricted male group comparison were significant at the .05 level or above. The lowest curriculum was practical nursing; the highest was power and home electricity.

Scale 24-Feedback

None of the analyses were significant. Male and female curriculum means were very similar.

Scale 25-Physical Facilities

The two female curriculum group comparisons were significant at the .01 level. Cosmetology scored highest of the female curriculums.

Scale 26-Work Relevance

All curriculums were very similar and none of the ANOVA tests were significant.

Scale 27-Company Prestige

Both of the comparisons of the female curriculum groups were significant at the .05 level or above. Most of the female curriculum mean scores were higher than the male curriculum mean scores.

Scale 28-Company Goals

Only the total group of female curriculums achieved a significant F-value

(.05 level). All female curriculums scored somewhat higher than the male curriculums.

Scale 29-Closure

Again, only the analysis of the total group of female curriculums was significant (.01 level). The lowest score over-all was machine shop; the highest was cosmetology.

Scale 30-Compensation II

The ANOVA F-value was significant only for the total group of female curriculums (.01 level). All of the male curriculums were higher than the female curriculums, with practical nursing the lowest and welding the highest.

TABLE I-D

MINNESOTA IMPORTANCE QUESTIONNAIRE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE MALE CURRICULUMS

	Power and Home Electricity	Carpentry	Automotives	Drafting and Design	Machine Shop	Welding	Accounting (Male)	F test (total male group)	F test (without Accounting Male)
1. Ability Utilization	19.73 (2.61)	19.49 (2.78)	19.02 (2.87)	19.75 (2.42)	18.82 (2.66)	19.26 (3.18)	19.60 (2.79)	1.52	1.64
2. Achievement	19.15 (3.02)	18.74 (2.97)	18.46 (2.89)	19.27 (2.73)	18.51 (2.62)	18.47 (3.24)	19.05 (2.92)	1.40	1.46
3. Activity	17.21 (3.01)	17.17 (3.32)	16.38 (2.93)	16.12 (3.07)	16.54 (3.02)	16.34 (3.48)	15.61 (2.99)	2.65*	1.72
4. Advancement	20.55 (2.93)	20.19 (3.01)	19.19 (3.31)	20.78 (2.89)	19.59 (3.41)	19.96 (3.48)	20.96 (3.05)	4.64**	3.84**
5. Authority	12.21 (3.28)	12.68 (3.19)	11.92 (3.65)	11.81 (3.04)	12.41 (3.47)	11.68 (3.50)	11.40 (3.25)	1.37	1.07
6. Company Practices and Policy	19.42 (3.02)	18.86 (3.00)	18.51 (3.13)	19.59 (3.04)	18.49 (3.32)	18.79 (3.21)	19.27 (2.95)	1.96	2.08
7. Compensation I	18.00 (3.30)	18.36 (2.61)	17.68 (3.09)	17.71 (2.83)	17.07 (2.88)	18.07 (3.08)	17.90 (3.71)	1.29	1.65
8. Co-workers	18.46 (3.20)	18.29 (3.00)	17.93 (3.38)	18.85 (3.19)	18.00 (3.13)	17.93 (3.47)	18.44 (3.37)	1.12	1.25
9. Creativity	15.58 (3.43)	15.48 (3.13)	15.17 (3.23)	15.31 (3.04)	14.79 (3.56)	14.91 (3.39)	14.28 (3.41)	1.56	.70
10. Independence	11.75 (3.94)	11.72 (4.12)	11.98 (3.53)	9.99 (3.69)	10.76 (3.36)	11.25 (3.86)	10.30 (3.51)	4.42**	4.06**

TABLE I-D (continued)

MINNESOTA IMPORTANCE QUESTIONNAIRE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE MALE CURRICULUMS

	Power and Home Electricity	Carpentry	Automotives	Drafting and Design	Machine Shop	Welding	Accounting (Male)	F test (total male group)	F test (without Accounting Male)
11. Moral Value	18.48 (3.99)	18.56 (4.11)	18.18 (3.64)	18.76 (3.91)	18.38 (4.29)	18.13 (4.04)	18.60 (3.47)	.38	.38
12. Recognition	16.52 (3.80)	16.09 (3.38)	16.24 (3.56)	16.22 (3.35)	16.25 (3.55)	16.58 (3.78)	16.52 (3.69)	.26	.26
13. Responsibility	15.56 (3.12)	15.54 (2.95)	14.97 (3.05)	14.72 (2.97)	14.94 (3.30)	14.54 (3.04)	14.09 (2.83)	2.50*	1.58
14. Security	21.13 (2.87)	20.61 (3.20)	20.57 (3.02)	21.57 (2.60)	20.46 (3.52)	20.85 (2.90)	21.60 (2.84)	2.37*	1.79
15. Social Service	16.10 (2.98)	16.38 (3.01)	16.71 (3.14)	16.38 (3.50)	16.10 (2.86)	14.68 (3.73)	16.61 (3.12)	5.24**	5.80**
16. Social Status	13.77 (3.63)	14.35 (3.55)	13.59 (3.81)	13.86 (3.54)	13.13 (3.64)	13.74 (3.58)	13.75 (3.73)	.71	.85
17. Supervision (Human Relations)	19.11 (2.92)	19.46 (2.83)	18.70 (3.02)	19.10 (2.73)	18.73 (3.16)	18.85 (3.07)	18.85 (3.15)	.71	.85
18. Supervision (Technical)	18.63 (2.82)	18.09 (2.57)	17.82 (3.15)	17.84 (2.71)	18.07 (2.97)	17.74 (2.66)	17.29 (2.57)	1.68	1.07
19. Variety	16.24 (3.96)	15.78 (3.08)	14.74 (3.56)	15.20 (3.31)	16.21 (3.62)	14.94 (3.70)	14.02 (3.50)	4.53**	3.26**
20. Working Conditions	19.49 (3.16)	19.32 (3.07)	19.27 (3.18)	19.20 (3.22)	19.52 (2.99)	19.36 (3.28)	19.02 (3.51)	.24	.13

TABLE I-D (continued)

MINNESOTA IMPORTANCE QUESTIONNAIRE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE MALE CURRICULUMS

	Power and Home Electricity	Carpentry	Automotives	Drafting and Design	Machine Shop	Welding	Accounting (Male)	F test (total male group)	F test (without Accounting Male)
21. Work Challenge	15.27 (3.18)	15.90 (3.24)	14.92 (3.66)	15.19 (3.73)	15.17 (3.55)	15.76 (3.34)	15.34 (3.76)	.92	1.10
22. Company Image	18.80 (3.33)	19.29 (3.14)	18.80 (3.09)	19.23 (2.76)	17.93 (3.03)	18.63 (3.19)	19.41 (3.17)	2.11*	1.89
23. Organizational Control	14.92 (3.34)	14.65 (3.19)	14.46 (3.32)	13.78 (3.25)	14.31 (3.43)	14.04 (3.32)	13.32 (3.28)	2.34*	1.30
24. Feedback	16.66 (3.47)	16.06 (3.07)	15.97 (2.93)	16.60 (2.83)	15.87 (3.01)	16.52 (2.99)	16.85 (3.05)	1.55	1.26
25. Physical Facilities	17.20 (3.73)	16.91 (3.16)	17.92 (3.92)	17.12 (4.41)	17.31 (3.71)	17.54 (3.84)	16.48 (4.16)	1.62	.99
26. Work Relevance	16.73 (3.21)	16.14 (2.81)	15.91 (3.29)	16.71 (3.23)	15.93 (2.67)	15.85 (3.34)	16.15 (3.19)	1.28	1.54
27. Company Prestige	17.90 (3.18)	17.83 (2.90)	17.15 (3.12)	18.12 (3.19)	17.80 (2.84)	17.33 (3.84)	17.60 (3.39)	1.26	1.53
28. Company Goals	16.86 (3.26)	16.65 (3.13)	16.44 (3.59)	16.75 (3.32)	16.17 (3.00)	16.23 (3.40)	16.87 (3.31)	.66	.59
29. Closure	17.35 (3.50)	17.16 (3.46)	17.35 (3.37)	16.74 (3.56)	16.68 (3.31)	17.82 (3.37)	16.89 (3.47)	1.39	1.51
30. Compensation II	17.58 (3.79)	18.09 (3.06)	17.30 (3.66)	17.20 (3.64)	17.39 (3.53)	18.36 (3.23)	17.71 (3.85)	1.52	1.86

NOTE: Standard Deviations in parentheses
*Significant at .05
**Significant at .01

TABLE II-D

MINNESOTA IMPORTANCE QUESTIONNAIRE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE FEMALE CURRICULUMS

	Practical Nursing	Cosmetology	Clerical	Secretarial	Accounting (Female)	F test (total female group)	F test (without Practical Nursing)
1. Ability Utilization	21.03 (2.94)	21.27 (2.92)	20.43 (3.14)	20.40 (2.94)	20.35 (2.72)	3.50**	2.87*
2. Achievement	21.04 (2.50)	20.47 (2.62)	19.86 (2.84)	19.99 (2.81)	19.79 (2.69)	8.27**	1.51
3. Activity	17.56 (3.34)	17.59 (3.58)	16.72 (3.36)	16.54 (3.40)	16.21 (3.28)	5.76**	3.66*
4. Advancement	15.71 (4.26)	19.38 (3.10)	19.77 (3.21)	20.07 (3.46)	19.86 (3.45)	64.48**	1.34
5. Authority	9.74 (3.00)	10.48 (3.37)	10.57 (3.29)	10.68 (3.45)	10.24 (3.28)	3.35**	.46
6. Company Practices and Policy	19.75 (3.22)	19.87 (3.39)	20.33 (3.58)	20.62 (3.04)	20.32 (3.09)	3.05*	1.62
7. Compensation I	15.01 (3.64)	17.17 (3.63)	16.85 (3.46)	17.13 (3.09)	16.67 (3.57)	16.62**	.74
8. Co-workers	18.95 (3.27)	19.51 (3.32)	19.91 (3.62)	19.91 (3.48)	18.91 (3.07)	4.37**	2.49
9. Creativity	12.45 (3.12)	16.41 (3.74)	14.22 (3.05)	14.46 (3.17)	13.56 (3.37)	33.77**	16.73**
10. Independence	8.79 (3.38)	11.34 (4.06)	10.82 (3.85)	10.50 (3.78)	10.38 (3.80)	14.06**	1.68

TABLE II-D (continued)

MINNESOTA IMPORTANCE QUESTIONNAIRE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE FEMALE CURRICULUMS

	Practical Nursing	Cosmetology	Clerical	Secretarial	Accounting (Female)	F test (total female group)	F test (without Practical Nursing)
11. Moral Value	21.20 (3.47)	20.75 (3.12)	20.13 (4.00)	20.74 (3.81)	20.69 (3.52)	2.55*	1.39
12. Recognition	13.67 (3.66)	16.69 (3.81)	16.19 (3.56)	15.72 (3.37)	16.04 (3.63)	23.19**	2.38
13. Responsibility	13.01 (2.91)	15.12 (3.06)	14.06 (3.25)	14.36 (2.91)	13.80 (3.21)	12.22**	4.18**
14. Security	20.10 (3.33)	20.77 (2.86)	20.81 (3.35)	20.68 (3.07)	20.78 (3.00)	2.06	.08
15. Social Service	22.76 (2.53)	20.03 (3.54)	18.51 (3.79)	18.73 (3.76)	18.23 (3.89)	66.26**	5.53**
16. Social Status	10.68 (3.86)	13.17 (3.99)	12.80 (3.66)	12.59 (3.78)	12.50 (3.46)	14.79**	.85
17. Supervision (Human Relations)	18.32 (3.24)	18.88 (3.26)	19.13 (3.51)	19.03 (3.09)	18.79 (3.16)	2.37	.31
18. Supervision (Technical)	18.36 (3.06)	18.46 (3.11)	18.22 (2.89)	17.88 (2.92)	17.98 (2.78)	1.46	1.41
19. Variety	14.71 (3.68)	15.49 (3.60)	15.05 (3.51)	15.60 (3.65)	14.67 (3.86)	2.88*	2.18
20. Working Conditions	18.22 (3.56)	20.05 (3.21)	19.64 (3.51)	19.54 (3.33)	19.22 (3.61)	8.59**	1.14

TABLE II-D (continued)

MINNESOTA IMPORTANCE QUESTIONNAIRE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE FEMALE CURRICULUMS

	Practical Nursing	Cosmetology	Clerical	Secretarial	Accounting (Female)	F test (total female group)	F test (without Practical Nursing)
21. Work Challenge	12.29 (3.92)	14.77 (3.59)	14.35 (4.14)	13.87 (3.88)	13.61 (4.23)	11.92**	2.25
22. Company Image	19.13 (3.28)	19.85 (3.09)	19.99 (3.50)	19.78 (3.22)	19.52 (2.98)	2.50*	.49
23. Organization Control	11.67 (2.98)	14.22 (3.40)	13.27 (2.91)	13.65 (2.87)	12.98 (3.43)	21.20**	3.76*
24. Feedback	16.00 (3.24)	16.91 (3.05)	16.54 (3.05)	16.24 (2.81)	16.21 (3.05)	2.24	1.79
25. Physical Facilities	14.86 (4.18)	17.06 (4.15)	15.88 (4.22)	15.50 (3.99)	14.88 (4.67)	6.64**	5.77**
26. Work Relevance	16.33 (3.53)	16.93 (3.56)	16.64 (3.52)	16.56 (3.47)	16.52 (3.48)	.64	.37
27. Company Prestige	19.18 (3.52)	18.78 (3.62)	17.69 (3.17)	18.20 (3.64)	18.18 (3.40)	6.15**	2.63*
28. Company Goals	17.37 (3.51)	18.25 (3.62)	18.00 (3.69)	18.34 (3.52)	17.78 (3.16)	2.98*	.83
29. Closure	16.92 (3.85)	18.48 (3.56)	17.75 (3.40)	17.59 (3.43)	17.54 (3.66)	4.20**	2.06
30. Compensation II	14.76 (3.97)	16.59 (3.79)	16.16 (4.06)	16.42 (3.75)	16.03 (3.76)	8.19**	.58

NOTE: Standard Deviations in parentheses
*Significant at .05
**Significant at .01

APPENDIX E

THE VOCATIONAL DEVELOPMENT INVENTORY (VDI)

The VDI (Crites, 1965) was used by Project MINI-SCORE to assess a dimension of vocational maturity. It yields only a single score. Tables I-E and II-E present the group mean scores, standard deviations, and F-values obtained from the analyses of the male and the female curriculum groups, respectively. Results indicate that the VDI was able to differentiate between groups. All ANOVA comparisons were significant at the .05 level or above with both of the female curriculum group comparisons significant at the .01 level. The highest curriculum mean score was associated with practical nursing and the lowest with welding.

TABLE I-E

VDI SCALE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE MALE CURRICULUMS

Power and Home Electricity	Carpentry	Automotives	Drafting and Design	Machine Shop	Welding	Accounting (Male)	F test (total male group)	F test (without Accounting Males)
37.60 (4.05)	37.38 (4.68)	36.75 (4.61)	37.99 (3.99)	37.59 (4.66)	35.94 (5.02)	37.01 (3.82)	2.40*	2.76*

NOTE: Standard Deviations in parentheses
*Significant at .05

TABLE II-E

VDI SCALE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE FEMALE CURRICULUMS

Practical Nursing	Cosmetology	Clerical	Secretarial	Accounting (Female)	F test (total female group)	F test (without Practical Nursing)
40.57 (2.96)	37.73 (3.80)	37.54 (4.16)	38.70 (3.44)	38.00 (4.22)	25.84**	4.70**

NOTE: Standard Deviations in parentheses
**Significant at .01

APPENDIX F

MINNESOTA SCHOLASTIC APTITUDE TEST (MSAT)

The MSAT (Berdie and others, 1962) is designed to assess scholastic aptitude and is administered through the Minnesota State-Wide Testing Program at the eleventh grade level to most students in Minnesota high schools. The MSAT is a short form of the Ohio Psychological Examination which yields a single score. Approximately ten per cent of the study population did not have MSAT scores and were not included in this section of the analysis because the Minnesota Vocational-Technical school population includes persons who have attended high schools in other states, who graduated from Minnesota high schools before the MSAT program was established, or in a few cases, dropped out of high school before taking the MSAT.

The MSAT effectively differentiated between curriculum groups with all four comparisons significant at the .01 level. The average mean scores of the female curriculums tended to be somewhat higher than those of the males. The highest mean score was that of practical nursing (33.56) and the lowest mean score was that of welding (23.10). Tables I-F and II-F present curriculum mean scores, standard deviations and F-test values for the male and female groups respectively.

TABLE I-F

MSAT SCALE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE MALE CURRICULUMS

Power and Home Electricity	Carpentry	Automotives	Drafting and Design	Machine Shop	Welding	Accounting (Male)	F test (total male group)	F test (without Accounting Males)
26.28 (9.20)	25.37 (8.27)	25.24 (9.71)	29.52 (8.92)	24.14 (9.18)	23.10 (8.29)	28.62 (10.66)	5.43**	5.12**

NOTE: Standard Deviations in parentheses
**Significant at .01

TABLE II-F

MSAT SCALE
MEANS, STANDARD DEVIATIONS AND ANOVA F-VALUES
ASSOCIATED WITH THE ANALYSES OF DIFFERENCES
AMONG THE FEMALE CURRICULUMS

Practical Nursing	Cosmetology	Clerical	Secretarial	Accounting (Female)	F test (total female group)	F test (without Practical Nursing)
33.56 (11.05)	27.57 (9.93)	25.61 (9.28)	32.00 (10.28)	29.81 (10.33)	20.51**	18.11**

NOTE: Standard Deviations in parentheses
**Significant at .01