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A Study of Vocational Choices and Preferences of Freshmen Male Students at State College in Terms of Their Abilities and Scholastic Achievement in College

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A STUDY OF VOCATIONAL CHOICES AND PREFERENCES OF FRESHMEN MALE STUDENTS AT STATE COLLEGE IN TERMS OF THEIR ABILITIES AND SCHOLASTIC ACHIEVEMENT IN COLLEGE

by

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SECTION I

INTRODUCTION

Statement of the Problem

The writer in this problem is deeply concerned with those high school students who are preparing themselves for the future and are going to college. Naturally colleges as well as students and their parents are interested in factors which make for success in college. Several of these are well known, such as, general mental ability, keen interest in college work, good study habits, regular attention to college tasks and definite vocational choice. The last of these mentioned, definite vocational choice has been subjected to less research than any of the others. This study has as its objective to determine if the more capable students, in terms of better scholastic ability, had made their vocational choices as they began their college work and to determine the degree to which those students who had made definite vocational choices or expressed very definitely their vocational preferences, achieved better or less well than those who had not made such choices, early in college work.

The general impression students and college faculties have is that the student who has committed himself to a vocational choice will consequently work harder at it and achieve better than the student who has not yet made his occupational choice. It is felt that the student without a vocational choice misses an important motivation and tends to flounder around in his work, achieving less well than the other one. But these are general impressions. The purpose of this study is to gather and statistically treat the pertinent data which may give a

definite positive or negative answer to this general impression.

The writer has no knowledge that such a problem concerning vocational choices and vocational preferences and their relationship to academic achievement, has been undertaken in South Dakota. There have been studies, a thesis by William Hass[1], on comparing educational proficiency of one-room-school graduates and town-elementary-school graduates found in the freshman and sophomore classes of six eastern South Dakota high schools. A research was completed by John Woodruff[2] on scholastic records and personality and character traits of public-school trained versus parochial-school-trained students, in the Aberdeen, South Dakota school systems. These studies are not so similar to this one in content as they are similar to it in statistical technique. Guy Karnes[3] completed a research dealing with vocational choices of high school graduates and the relation of their choices to their ACE Test scores. However, Karnes used different stastical methods to analyze his problem.

This study seeks to show the difference between those students who had made their vocational choices while taking their ACE Tests in their senior year in high school and those students that tend to

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1. W. V. Hass, A Study Comparing the Educational Proficiency of The One Room School Graduates and the Town Elementary School Graduates Found in the Freshman and Sophomore Class of Six East Central High Schools in South Dakota, Thesis at South Dakota State College, Brookings, South Dakota. January 1948.

2. J. J. Woodruff, Scholastic Records and Personality and Character Traits of the Public School Trained and the Parochial Trained Student of the Graduating Class of 1952, Research Problem at South Dakota State College, Brookings, South Dakota. July 1953.

3. G. Karnes, A Comparative Study of the Scholastic Ability of South Dakota High School Seniors in their Self-Selected Occupational Groups as Evaluated by State-Wide ACE Test Results in 1952. Research Problem at South Dakota State College, Brookings, South Dakota. July 1953.

neglect their vocational choices while taking their ACE Tests and select various vocational preferences to vocations or do not specify any preferences, while enrolling as freshmen at South Dakota State College at Brookings, South Dakota.

In making this study the writer made use of selected data on freshmen men students at South Dakota State College. The larger group from which the sample was selected is shown in Table I.

TABLE I

MALE ENROLLMENT, STATE COLLEGE FRESHMEN 1952, FALL QUARTER

REGISTERED BY DIVISION	FREQUENCY
General Agriculture	204
Agriculture Engineering	1
General Engineering	176
Pharmacy	51
General Science	105
General Registration	116
	653

Two main groups were set up, Group X and Group Y. Group X is that group that have the same identical vocational choices and vocational preferences on the high school ACE Test and on the Application For Admission blank at State College. (See Appendix A) Group Y is that group which failed to make an identical vocational choice or vocational preference on the ACE Test and Application For Admission blank at State College. (See Appendix B, ACE Test)

When enrolling at State College, all students must give vocational data. The information of vocational preferences which is used in this problem as a comparison of success or failure is found on the Application For Admission blank, items #67-72. Students must rate in order of preference 1-2-3, the three occupations which they would like to see themselves in ten years from now. These data were treated statistically by comparing the two groups X and Y on their fall-quarter-grade-point-averages.

In Table II is shown the number of students who enrolled in the various courses that were pertinent to their vocational preferences. It shows the frequency of Groups X and Y in terms of the various occupational preferences.

TABLE II

FREQUENCY OF VOCATIONAL PREFERENCES LISTED BY GROUPS X AND Y ON THE APPLICATION FOR ADMISSION BLANKS, STATE COLLEGE, ITEMS 67-72.

GROUP X	FREQUENCY	GROUP Y	FREQUENCY
Accountant	0	Accountant	2
Advertising Man	0	Advertising Man	1
Agriculture Teacher	5	Agriculture Teacher	4
Architect	2	Architect	2
Artist	2	Artist	2
Author-journalist	4	Author-journalist	2
Aviator	1	Aviator	4
Bacteriologist	0	Bacteriologist	2
Carpenter	1	Carpenter	1
CPA	1	Chemist	3
Chemist	2	Civil Engineer	10
Civil Engineer	22	College Professor	1
College Professor	0	Contractor	1
Contractor	0	County Agent	1
County Agent	0	Dentist	1
Dentist	2	Electrical Engineer	21
Electrical Engineer	12	Electrician	1
Electrician	0	Explorer	1
Farmer	13	Farmer	21
Forest Service	0	Forest Service	2
Lab Technician	2	Lab Technician	1
Lawyer	1	Lawyer	1
Math, Phy. Teacher	1	Mathematician	1
Mechanic	0	Math, Phy. Teacher	1
Mechanical Engineer	7	Mechanic	1
Musician	0	Mechanical Engineer	4
Office Manager	1	Musician	5
Office Worker	1	Office Manager	1
Pharmacist	18	Phy. Ed. Teacher	7
Phy. Ed. Teacher	5	Physicist	2
Physicist	1	Physician	3
Physician	0	Psychologist	2
Printer	1	Rancher	10
Rancher	3	Sales Manager	1
Sales Manager	1	School Supt.	1
School Supt.	0	Service Officer	1
Soc. Science Teacher	1	Soc. Science Teacher	2
YMCA Secretary	0	YMCA Secretary	1
Other, No Specifications listed as job preference	20	Other, No Specifications listed as job preference	23
TOTAL	129		148

Delimitation of the Problem

To pinpoint the sampling of the problem, Table III lists the Freshman male population considered for this study. Groups X and Y were specifically selected for this study.

TABLE III

BREAKDOWN OF MALE STUDENTS, IN THE LIMITATION OF THIS STUDY

STUDENT BREAKDOWN	FREQUENCY	
Out-of-State students	97	
Transfers, due to changes in registration	55	
Drop-outs, same vocational choice and preference	48	
Drop-outs, no vocational choice and preference	52	
No ACE scores, no choice and preference	31	
No ACE scores, same choice and preference	38	
No ACE score on cards available	50	
No Grade-Point-Averages, records incomplete	6	
Same vocational choices and preferences, all information available	148	Group X
No identical choice or preference or choice or preference not made, all information available	129	Group Y
TOTAL	654	

From the 654 male students shown in Table III, actually 277 were selected for this study. The elimination was made because the others did not have complete enough data to use in the problem. Of these, 129 were in Group Y and 148 in Group X. The total sampling of this problem then is 277 male freshmen students, who according to their respective groups X and Y had made their vocational choices on the ACE Test and listed or failed to make either a vocational choice or preference on the Application For Admission blanks.

Vocational Choice as defined in Webster's Dictionary[1] means this: "The work or profession for which one has a vocation or is specially fitted; as, to choose medicine as one's life work". It means in essence to select a field of endeavor, where one's interests lie and his ability permits. The vocational choices were made by these students when they took the ACE Test in their senior year in high school.

Vocational Preference as defined by Bedford[2] is this: "Choosing a vocation which is preferred to all others, and is desirable for the advantages it offers". This indeed is an ample explanation that affects all students. Many students prefer one thing and choose another. They tend to prefer something, that in many cases are out of their reach. The majority of students prefer white-collar jobs, yet in reality they become farmers, laborers, and the like. In essence, preference is what you would like yourself to be, maybe 10 to 15 years from now. The vocational preferences were indicated on the Application For Admission blanks, items 67-72.

1. Merriam-Webster, Webster's Collegiate Dictionary, G. and C. Merriam Co., Second Edition, Springfield, Mass., 1946, p. 1124.

2. James H. Bedford, Ph.D., Your Future Job, Society for Occupational Research, Los Angeles, California, 1950, p. 52.

Sources of Data

The writer in gathering his data secured the permanent record cards that are on file in the registrar's office here at South Dakota State College. The ACE Test scores, occupational choices, occupational preferences 1 - 2 - 3, grade-point-averages, student number, high-school code number, college division and students name were all taken from them. These data, ACE scores and grade-point-averages were then both punched and typed on the IBM cards.

ACE Test Data The purpose of the American Psychological Examination Test is to appraise what has been called scholastic aptitude or general intelligence, with special reference to the requirements of most college curricula. The ACE examination consists of the six tests that have been in use for several years. Studies justified the grouping of the six tests in two general classes, as follows:

Quantitative Tests: (Q-Score)

Linguistic Tests: (L-Score)

Sum of both Q and L scores: (T-Score)

The Quantitative Test is divided into three separate sections: Arithmetical Reasoning, Number Series, and Figure Analogies. The Linguistic Test is also divided into three separate sections: the Same-Opposite, Completion, and Verbal Analogies tests. It is not recommended that the six separate test scores be used for any counseling, but there seems to be justification for using the two principle subscores as well as the total or gross score in this manner. They are the Q-Score, the L-Score, and the T-Score. The T-Score is the sum of Q-Score and L-Score and is the one used here in the calculations.

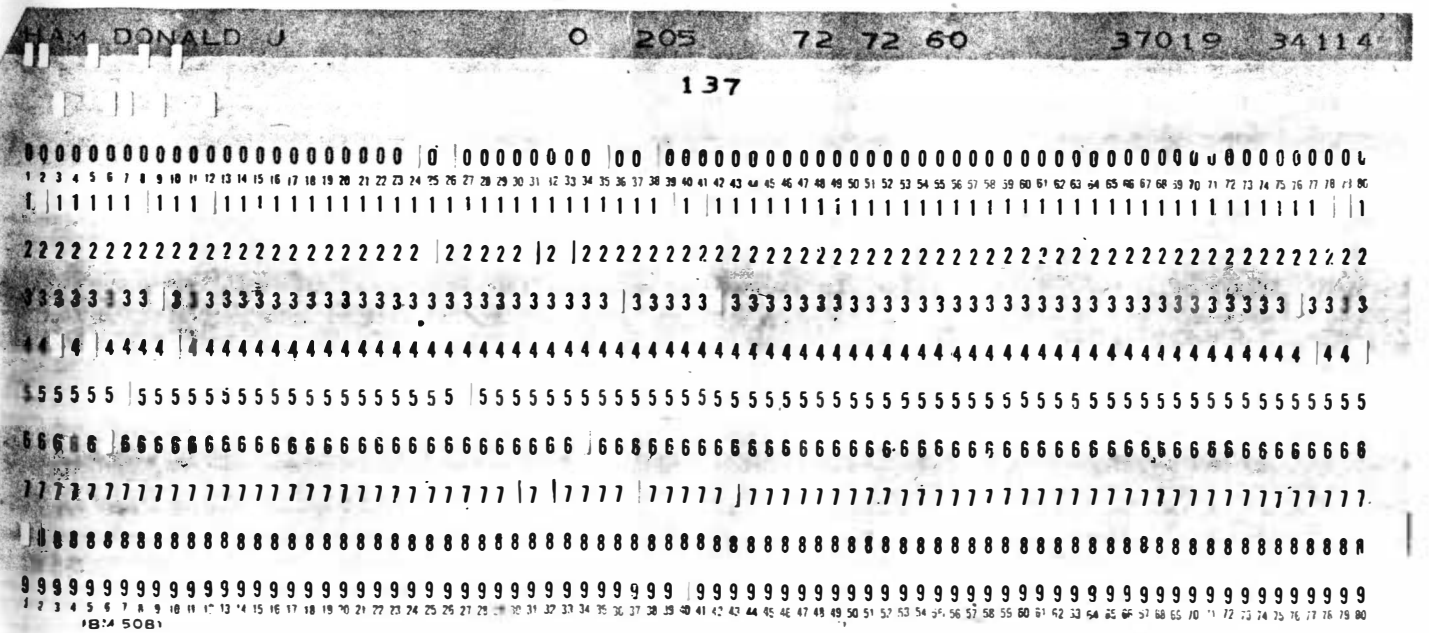
The test forms should be found useful in handling those problems in which it is advisable to distinguish a student's mental abilities from his high-school preparation and his industry. Faculty action in the case of a student who is failing can be intelligently guided if one has some means of knowing to what extent his high-school training meets the requirements of his college course and what his mental abilities are. Very different faculty action can be taken, depending on which of these three factors may be held primarily responsible for a student's failure. It is to be hoped that these psychological tests may lead to the early discovery of bright students. Generally, the best usefulness of these tests is in combination with other evidence of ability such as grades in high school and in content examinations that are given uniformly to all students.

South Dakota State College gives all entering freshmen this ACE Test, in hopes of discovering those students that are not qualified for college and discovering those students that may make a success of college work. Norms for the interpretation of scores on the current edition of the examination are prepared by the authors[1] on the basis of the reports sent in by the colleges using the test. These norms include tables of percentiles for the three sets of scores. The Q-Scores, which represent ability to think in quantitative terms, the L-Scores, which involve linguistic abilities, and the T-Scores, which involve both abilities. These norms should be interpreted in terms of percentile ranks.

1. L. L. Thurstone and Thelma G. Thurstone, American Council on Education Psychological Examination for College Freshmen, Washington, D.C. 1946. p. 3.

Grade-Point-Average Data This means the average of all marks in the courses taken, in the fall quarter of the school year 1952. This is done at South Dakota State College by averaging A as 4, B as 3, C as 2, D as 1, and F as 0. So if a student has a grade-point-average of 2.14 they are considered as average students with average marks, or slightly over a C average. In this study they will be used as a means to compare Group X with Group Y in measure of achievement.

IBM Data The IBM method of accounting is very new. IBM means International Business Machines. The writer used IBM source cards which were duplicated by the various IBM machines, from the permanent record cards taken from the registrar's office. These cards were then used to tabulate the various data needed for this study. An example of this IBM source card is shown below as figure 1-A.



IBM SOURCE CARD Figure 1-A

The tremendous power of IBM accounting is summarized most appropriately as[1] "its ability to provide current accounting and statistical information in what ever form is best suited to the needs of management." Basic to this method of accounting is the IBM card, see figure 1-A, page 9. When information is punched into it, the card used with high-speed electronic and electric machines, becomes a highly versatile instrument. Used together, the cards and the machines result in an almost infinite variety of accounting records requiring different handling of the same data. Cards may be punched in several ways on manually operated machines by automatic reproduction from existing punched cards or through the use of mark sensing, a development in electronics that permits automatic punching from pencil marks. Auxiliary machines will reproduce cards, duplicate, sort, collate, gang-punch, interpret, and summary punch them, they will also compute results from data in the cards, post data, select it and print it. Figure 1-A, page 9 shows an actual punched IBM source card and the various items of information on it. The key to figure 1-A is shown as figure 1-B on the following page.

The various IBM machines that the writer used in his study counted and sorted the number of students for the fall quarter of 1952 by electronic impulses from the punched IBM cards. It also sorted the cards into the various occupational choices and preferences and alphabetized them. It ranked the ACE scores and grade-point-averages and gave a grand total of all calculations involved.

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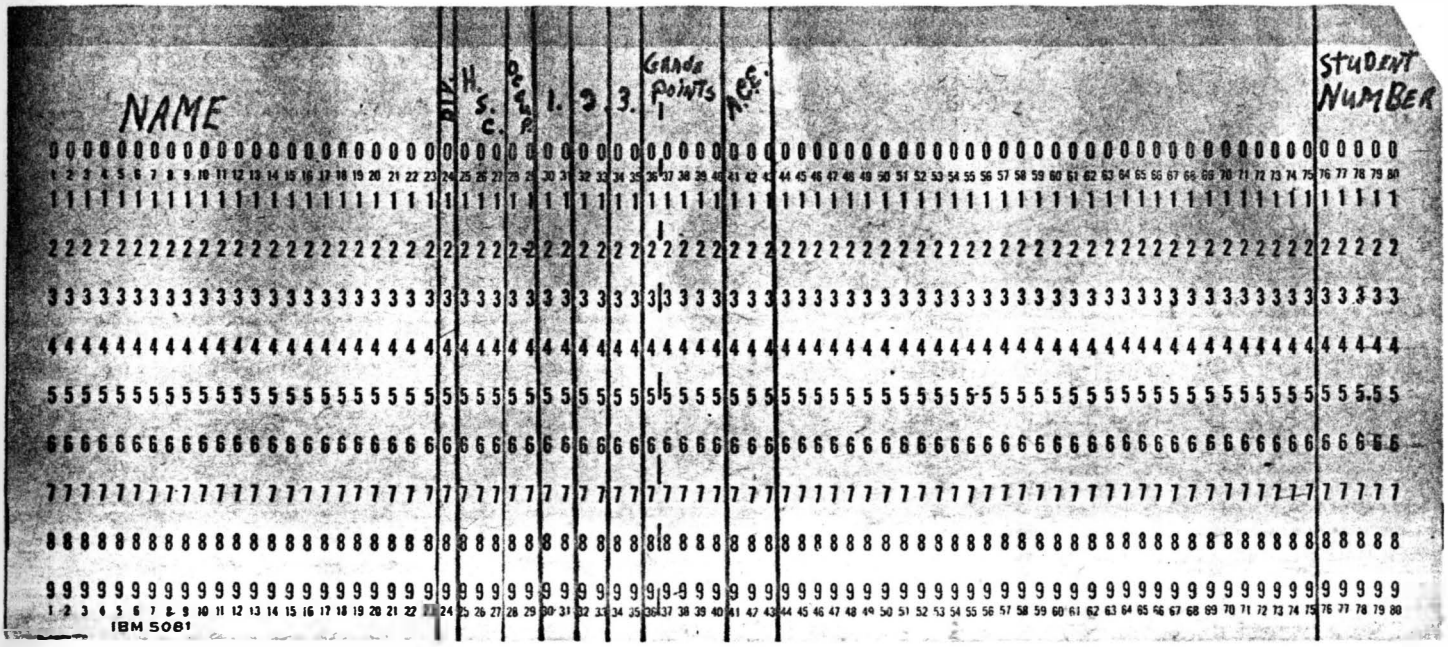
1. _____, IBM Accounting, International Business Machines Corporation, New York, New York. 1954. p. 6.

Below is figure 1-B which is the master key to all source data used in this study. Across the top of the IBM master key is printed the information that is coded or punched into it.



IBM MASTER KEY TO SOURCE CARDS Figure 1-B

TABLE V

FREQUENCY OF ACE TEST SCORES ON AMERICAN COUNCIL ON EDUCATION PSYCHOLOGICAL EXAMINATION FOR COLLEGE FRESHMEN, USING ARBITRARY ORIGIN FOR COMPUTING MEAN AND STANDARD DEVIATION. GROUP X, SAME VOCATIONAL CHOICES AND PREFERENCES

Score (1)	X-100 (2)	X^2 (3)	Score (1)	X-100 (2)	X^2 (3)
146	46	2116	105	5	25
143	43	1849	105	5	25
143	43	1849	105	5	25
136	36	1296	105	5	25
135	35	1225	104	4	16
135	35	1225	104	4	16
134	34	1156	104	4	16
133	33	1089	104	4	16
132	32	1024	103	3	9
129	29	841	103	3	9
129	29	841	103	3	9
128	28	784	102	2	4
128	28	784	102	2	4
128	28	784	102	2	4
126	26	676	102	2	4
124	24	576	102	2	4
124	24	576	101	1	1
123	23	529	101	1	1
123	23	529	101	1	1
122	22	484	100	0	0
122	22	484	100	0	0
121	21	441	100	0	0
119	19	361	100	0	0
117	17	289	100	0	0
117	17	289	100	0	0
116	16	256	100	0	0
116	16	256	99	-1	1
114	14	196	99	-1	1
113	13	169	98	-2	4
111	11	121	98	-2	4
110	10	100	98	-2	4
109	9	81	97	-3	9
109	9	81	96	-4	16
109	9	81	96	-4	16
108	8	64	94	-6	36
108	8	64	94	-6	36
108	8	64	94	-6	36
107	7	49	93	-7	49
107	7	49	91	-9	81
106	6	36	91	-9	81
106	6	36	90	-10	100
106	6	36	90	-10	100
106	6	36	90	-10	100
106	6	36	90	-10	100

TABLE V Continued

Score (1)	X-100 (2)	X^2 (3)
89	-11	121
88	-12	144
88	-12	144
87	-13	169
87	-13	169
87	-13	169
87	-13	169
86	-14	196
85	-15	225
85	-15	225
84	-16	256
82	-18	324
82	-18	324
82	-18	324
82	-18	324
81	-19	361
81	-19	361
80	-20	400
80	-20	400
79	-21	441
79	-21	441
77	-23	529
77	-23	529
77	-23	529
76	-24	576
76	-24	576
75	-25	625
75	-25	625
74	-26	676
73	-27	729
73	-27	729
72	-28	784
71	-29	841
71	-29	841
69	-31	961
68	-32	1024
66	-34	1156
63	-37	1369
63	-37	1369
62	-38	1444
52	-48	2304
TOTAL N = 129	Σ -81	Σ 48799

TABLE VI

FREQUENCY OF ACE TEST SCORES ON AMERICAN COUNCIL ON EDUCATION PSYCHOLOGICAL EXAMINATION FOR COLLEGE FRESHMEN, USING ARBITRARY ORIGIN FOR COMPUTING MEAN AND STANDARD DEVIATION. GROUP Y, DIFFERENT VOCATIONAL CHOICES AND PREFERENCES

Score (1)	Y-100 (2)	Y^2 (3)	Score (1)	Y-100 (2)	Y^2 (3)
142	42	1764	108	8	64
139	39	1521	108	8	64
138	38	1444	108	8	64
137	37	1369	108	8	64
131	31	961	108	8	64
130	30	900	108	8	64
130	30	900	108	8	64
129	29	841	106	6	36
125	25	625	105	5	25
125	25	625	105	5	25
125	25	625	105	5	25
124	24	576	105	5	25
122	22	484	104	4	16
122	22	484	104	4	16
120	20	400	103	3	9
120	20	400	103	3	9
118	18	324	102	2	4
118	18	324	102	2	4
117	17	289	102	2	4
117	17	289	102	2	4
117	17	289	102	2	4
116	16	256	102	2	4
115	15	225	101	1	1
115	15	225	100	0	0
114	14	196	100	0	0
113	13	169	99	-1	1
112	12	144	99	-1	1
112	12	144	99	-1	1
112	12	144	98	-2	4
111	11	121	98	-2	4
111	11	121	97	-3	9
111	11	121	97	-3	9
110	10	100	97	-3	9
109	9	81	97	-3	9
109	9	81	97	-3	9
109	9	81	97	-3	9
109	9	81	96	-4	16
			96	-4	16
			96	-4	16

TABLE VI Continued

Score (1)	Y-100 (2)	Y^2 (3)	Score	Y-100 (2)	Y^2 (3)
95	-5	25	80	-20	400
94	-6	36	80	-20	400
94	-6	36	80	-20	400
94	-6	36	80	-20	400
94	-6	36	79	-21	441
93	-7	49	77	-23	529
92	-8	64	76	-24	576
92	-8	64	76	-24	576
90	-10	100	76	-24	576
90	-10	100	76	-24	576
89	-11	121	76	-24	576
89	-11	121	75	-25	625
89	-11	121	74	-26	676
88	-12	144	74	-26	676
87	-13	169	74	-26	676
87	-13	169	73	-27	729
86	-14	196	73	-27	729
86	-14	196	73	-27	729
86	-14	196	73	-27	729
86	-14	196	72	-28	784
86	-14	196	72	-28	784
86	-14	196	71	-29	841
85	-15	225	71	-29	841
85	-15	225	71	-29	841
85	-15	225	70	-30	900
85	-15	225	70	-30	900
84	-16	256	69	-31	961
84	-16	256	65	-35	1225
84	-16	256	64	-36	1296
84	-16	256	64	-36	1296
84	-16	256	63	-37	1369
84	-16	256	63	-37	1369
81	-19	361	62	-38	1444
81	-19	361	56	-44	1936
81	-19	361	54	-46	2116
			44	-56	3136
			42	-58	3364
		TOTAL	148	Σ -746	Σ 61004

Measures of Central Tendency for Grade-Point-Averages

The scores obtained from the grade-point averages were arranged into two groups, X and Y. Group X designates those students whose vocational choices and preferences were the same. Group Y designates those students whose vocational choices and preferences were different or not yet made. The scores from Group X and Group Y were arranged in descending order from high to low, and the mean, median, standard deviation, and the range were obtained. The items previously listed above are referred to as Table VII.

TABLE VII

DISTRIBUTION OF GRADE POINT AVERAGES GROUP X AND GROUP Y

GROUPS OF STUDENTS	NUMBER OF SCORES	MEAN	MEDIAN	STANDARD DEVIATION	RANGE
X	129	2.1467	2.1892	.784	3.86-.36
Y	148	2.2489	2.1031	.858	3.97-.36

By careful observation of Table VII, it is noted that by comparison of the measures of central tendency one might possibly find that Group Y has just as good marks or better, than did Group X. This is the reverse of the situation for ACE Test scores, as was explained in Table IV, page 12. The writer also coded these Grade-Point-Averages and thereby reducing the numbers being used in the calculations. On the following pages, Tables VIII and IX were constructed for the Grade-Point-Averages of both groups. From the totals of column two and three, the Standard Deviations were computed.

Group X: S.D. = .784

Group Y: S.D. = .858

TABLE VIII

FREQUENCY OF GRADE POINT AVERAGES, FALL QUARTER 1952 STATE COLLEGE MALE FRESHMEN USING ARBITRARY ORIGIN FOR COMPUTING MEAN AND STANDARD DEVIATION GROUP X SAME CHOICE AND PREFERENCE

Score (1)	X-2 (2)	X^2 (3)	Score (1)	X-2 (2)	X^2 (3)
3.86	1.86	3.4596	2.43	.43	.1849
3.69	1.69	2.8561	2.43	.43	.1849
3.65	1.65	2.7225	2.41	.41	.1681
3.43	1.43	2.0449	2.40	.40	.1600
3.42	1.42	2.0164	2.40	.40	.1600
3.35	1.35	1.8225	2.40	.40	.1600
3.29	1.29	1.6641	2.39	.39	.1521
3.27	1.27	1.6129	2.37	.37	.1369
3.24	1.24	1.5376	2.36	.36	.1296
3.21	1.21	1.4641	2.35	.35	.1225
3.18	1.18	1.3924	2.33	.33	.1089
3.17	1.17	1.3689	2.28	.28	.0784
3.15	1.15	1.3225	2.27	.27	.0729
3.15	1.15	1.3225	2.24	.24	.0576
3.12	1.12	1.2544	2.24	.24	.0576
3.11	1.11	1.2321	2.22	.22	.0484
3.08	1.08	1.1664	2.22	.22	.0484
3.06	1.06	1.1236	2.21	.21	.0441
3.06	1.06	1.1236	2.21	.21	.0441
3.06	1.06	1.1236	2.21	.21	.0441
3.03	1.03	1.0609	2.20	.20	.0400
3.02	1.02	1.0404	2.19	.19	.0361
3.02	1.02	1.0404	2.18	.18	.0324
3.02	1.02	1.0404	2.17	.17	.0289
3.00	1.00	1.0000	2.17	.17	.0289
2.97	.97	.9409	2.17	.17	.0289
2.94	.94	.8836	2.17	.17	.0289
2.94	.94	.8836	2.15	.15	.0225
2.87	.87	.7569	2.12	.12	.0144
2.83	.83	.6889	2.11	.11	.0121
2.81	.81	.6561	2.10	.10	.0100
2.80	.80	.6400	2.09	.09	.0081
2.75	.75	.5625	2.08	.08	.0064
2.73	.73	.5329	2.05	.05	.0025
2.72	.72	.5184	2.00	.00	.0000
2.71	.71	.5041	1.96	-.04	.0016
2.60	.60	.3600	1.94	-.06	.0036
2.59	.59	.3481	1.94	-.06	.0036
2.59	.59	.3481	1.91	-.09	.0081
2.51	.51	.2601	1.90	-.10	.0100
2.45	.45	.2025	1.88	-.12	.0144
2.45	.45	.2025	1.88	-.12	.0144

TABLE VIII Continued

Score (1)	X-2 (2)	X^2 (3)
1.87	-.13	.0169
1.85	-.15	.0225
1.82	-.18	.0324
1.81	-.19	.0361
1.77	-.23	.0529
1.74	-.26	.0676
1.74	-.26	.0676
1.72	-.28	.0784
1.70	-.30	.0900
1.70	-.30	.0900
1.66	-.34	.1156
1.65	-.35	.1225
1.65	-.35	.1225
1.64	-.36	.1296
1.64	-.36	.1296
1.63	-.37	.1369
1.60	-.40	.1600
1.59	-.41	.1681
1.54	-.46	.2116
1.48	-.52	.2704
1.39	-.61	.3721
1.33	-.67	.4489
1.31	-.69	.4761
1.27	-.73	.5329
1.21	-.79	.6241
1.20	-.80	.6400
1.16	-.84	.7056
1.14	-.86	.7396
1.13	-.87	.7569
1.12	-.88	.7744
1.11	-.89	.7921
1.10	-.90	.8100
1.06	-.94	.8836
.97	-1.03	1.0609
.96	-1.04	1.0816
.96	-1.04	1.0816
.95	-1.05	1.1025
.93	-1.07	1.1449
.81	-1.19	1.4161
.62	-1.38	1.9044
.54	-1.46	2.1316
.48	-1.52	2.3104
.44	-1.56	2.4336
.39	-1.61	2.5921
.36	-1.64	2.6896
TOTAL N = 129	Σ 19.31	Σ 82.2481

TABLE IX

FREQUENCY OF GRADE POINT AVERAGES, FALL QUARTER 1952 STATE COLLEGE MALE FRESHMEN USING ARBITRARY ORIGIN FOR COMPUTING MEAN AND STANDARD DEVIATION GROUP I DIFFERENT VOCATIONAL CHOICE AND PREFERENCE OR THOSE NOT YET DECIDED

Score (1)	Y-2 (2)	Y^2 (3)	Score (1)	Y-2 (2)	Y^2 (3)
3.97	1.97	3.8809	2.78	.78	.6084
3.70	1.70	2.8900	2.78	.78	.6084
3.64	1.64	2.6896	2.75	.75	.5625
3.56	1.56	2.4336	2.73	.73	.5329
3.53	1.53	2.3409	2.72	.72	.5184
3.52	1.52	2.3104	2.67	.67	.4489
3.51	1.51	2.2801	2.65	.65	.4225
3.51	1.51	2.2801	2.62	.62	.3844
3.48	1.48	2.1904	2.60	.60	.3600
3.48	1.48	2.1904	2.54	.54	.2916
3.46	1.46	2.1316	2.51	.51	.2601
3.46	1.46	2.1316	2.51	.51	.2601
3.44	1.44	2.0736	2.51	.51	.2601
3.40	1.40	1.9600	2.48	.48	.2304
3.40	1.40	1.9600	2.48	.48	.2304
3.34	1.34	1.7956	2.47	.47	.2209
3.25	1.25	1.5625	2.44	.44	.1936
3.25	1.25	1.5625	2.43	.43	.1849
3.24	1.24	1.5376	2.43	.43	.1849
3.24	1.24	1.5376	2.42	.42	.1764
3.21	1.21	1.4641	2.40	.40	.1600
3.21	1.21	1.4641	2.40	.40	.1600
3.18	1.18	1.3924	2.37	.37	.1369
3.18	1.18	1.3924	2.36	.36	.1296
3.17	1.17	1.3689	2.34	.34	.1156
3.10	1.10	1.2100	2.33	.33	.1089
3.08	1.08	1.1664	2.32	.32	.1024
3.05	1.05	1.1025	2.29	.29	.0841
3.05	1.05	1.1025	2.29	.29	.0841
3.02	1.02	1.0404	2.28	.28	.0784
3.00	1.00	1.0000	2.24	.24	.0576
2.97	.97	.9409	2.23	.23	.0529
2.97	.97	.9409	2.21	.21	.0441
2.90	.90	.8100	2.18	.18	.0324
2.85	.85	.7225	2.18	.18	.0324
2.84	.84	.7056	2.18	.18	.0324
2.83	.83	.6889	2.18	.18	.0324
2.81	.81	.6561	2.16	.16	.0256
2.80	.80	.6400	2.12	.12	.0144
2.79	.79	.6241	2.11	.11	.0121
2.78	.78	.6084	2.10	.10	.0100

TABLE IX Continued

Score (1)	Y-2 (2)	Y^2 (3)	Score (1)	Y-2 (2)	Y^2 (3)
2.10	.10	.0100	1.27	-.73	.5329
2.10	.10	.0100	1.24	-.76	.5776
2.08	.08	.0064	1.24	-.76	.5776
2.05	.05	.0025	1.21	-.79	.6241
2.05	.05	.0025	1.21	-.79	.6241
2.00	.00	.0000	1.20	-.80	.6400
1.97	-.03	.0009	1.13	-.87	.7569
1.97	-.03	.0009	1.13	-.87	.7569
1.96	-.04	.0016	1.06	-.94	.8836
1.94	-.06	.0036	1.05	-.95	.9025
1.91	-.09	.0081	1.03	-.97	.9409
1.89	-.11	.0121	1.00	-1.00	1.0000
1.88	-.12	.0144	.97	-1.03	1.0609
1.83	-.17	.0289	.96	-1.04	1.0816
1.82	-.18	.0324	.94	-1.06	1.1236
1.81	-.19	.0361	.91	-1.09	1.1881
1.81	-.19	.0361	.87	-1.13	1.2769
1.81	-.19	.0361	.86	-1.14	1.2996
1.78	-.22	.0484	.86	-1.14	1.2996
1.78	-.22	.0484	.82	-1.18	1.3924
1.77	-.23	.0529	.81	-1.19	1.4161
1.77	-.23	.0529	.75	-1.25	1.5625
1.71	-.29	.0841	.68	-1.32	1.7424
1.66	-.34	.1156	.67	-1.33	1.7689
1.65	-.35	.1225	.65	-1.35	1.8225
1.64	-.36	.1296	.60	-1.40	1.9600
1.63	-.37	.1369	.48	-1.52	2.3104
1.61	-.39	.1521	.42	-1.58	2.4964
1.61	-.39	.1521	.36	-1.64	2.6896
1.45	-.55	.3025			
1.45	-.55	.3025			
1.42	-.58	.3364			
1.40	-.60	.3600			
1.38	-.62	.3844			
1.38	-.62	.3844			
1.35	-.65	.4225			
1.32	-.68	.4624			
		TOTAL	N = 148	Σ 26.08	Σ 113.7280

The "t" Test of Significance

Fisher's "t" test was then used in this investigation as it was recommended for the comparison of the performance of different groups under similar situations. This "t" value technique was found to be acceptable in educational research in comparable studies. For this, the 5% level of significance was arbitrarily shown and for purposes of this study was believed to be rigorous enough to impose upon the data.

The "t" test of significance was used in studying the difference which appeared to indicate abilities of the students, taking the ACE Tests. Both Groups X and Y were represented. In order to do this it was necessary that the ACE scores of both groups be placed on a table, with coded scores, this is represented on the following pages as Tables X and XI, pages 24-29. It is well to note here that Table X refers to ACE Test scores and that Table XI refers to Grade-Point-Average scores. The group members that have the same vocational choices and preferences were listed on the tables as X and those students whose vocational choices and preferences were different or not yet made, were listed on the tables as Group Y. An arbitrary number, the computation variable, in both cases was 100. A coded score was obtained and recorded on the table and then squared as was done in Table V and VI, which were prepared for standard deviation. The columns were then totaled and the numbers obtained and substitutedd in the formula set out on the following page, using S as the standard deviation of two variables and x - y as the standard error of the difference of two means.

The following formula was used in the computation of the "t" score value, found in this study.

FORMULAE FOR OBTAINING "t" SCORE VALUE

$$S = \sqrt{\Sigma X^2 - \left(\frac{\Sigma X}{N}\right)^2 + \Sigma Y^2 - \left(\frac{\Sigma Y}{N}\right)^2}$$

$$\sigma_{\bar{x} - \bar{y}} = S \sqrt{\frac{N_1 + N_2}{N_1 N_2}}$$

$$"t" = \frac{\bar{x} - \bar{y}}{\sigma_{\bar{x} - \bar{y}}}$$

"t" for ACE scores of Groups X and Y = 2.473

"t" for Grade Point Averages scores of Groups X and Y = 1.415

The reader will note that the "t" values are recorded at the end of Table I on ACE values and at the end of Table XI on grade-point-averages. The interpretation of these findings from the application of the method of computation is found in Section III on Findings.

TABLE X

FREQUENCY OF SCORES ON ACE TEST GROUP X AND GROUP Y USING ARBITRARY ORIGIN FOR COMPUTING NUMBERS TO BE USED IN "t" TEST OF SIGNIFICANCE

X (1)	Y (2)	X-100 (3)	Y-100 (4)	X^2 (5)	Y^2 (6)	X (1)	Y (2)	X-100 (3)	Y-100 (4)	X^2 (5)	Y^2 (6)
146	142	46	42	2116	1764	105	106	5	6	25	36
143	139	43	39	1849	1521	105	105	5	5	25	25
143	138	43	38	1849	1444	105	105	5	5	25	25
136	137	36	37	1296	1369	105	105	5	5	25	25
135	131	35	31	1225	961	104	105	4	5	16	25
135	130	35	30	1225	900	104	104	4	4	16	16
134	130	34	30	1156	900	104	104	4	4	16	16
133	129	33	29	1089	841	104	103	4	3	16	9
132	125	32	25	1024	625	103	103	3	3	9	9
129	125	29	25	841	625	103	102	3	2	9	4
129	125	29	25	841	625	103	102	3	2	9	4
128	124	28	24	784	576	102	102	2	2	4	4
128	122	28	22	784	484	102	102	2	2	4	4
128	122	28	22	784	484	102	102	2	2	4	4
126	120	26	20	676	400	102	102	2	2	4	4
124	120	24	20	576	400	102	101	2	1	4	1
124	118	24	18	576	324	101	100	1	0	1	0
123	118	23	18	529	324	101	100	1	0	1	0
123	117	23	17	529	289	101	99	1	-1	1	1
122	117	22	17	484	289	100	99	0	-1	0	1
122	117	22	17	484	289	100	99	0	-1	0	1
121	116	21	16	441	256	100	98	0	-2	0	4
119	115	19	15	361	225	100	98	0	-2	0	4
117	115	17	15	289	225	100	97	0	-3	0	9
117	114	17	14	289	196	100	97	0	-3	0	9
116	113	16	13	256	169	100	97	0	-3	0	9
116	112	16	12	256	144	99	97	-1	-3	1	9
114	112	14	12	196	144	99	97	-1	-3	1	9
113	112	13	12	169	144	98	97	-2	-3	4	9
111	111	11	11	121	121	98	96	-2	-4	4	16
110	111	10	11	100	121	98	96	-2	-4	4	16
109	111	9	11	81	121	97	96	-3	-4	9	16
109	110	9	10	81	100	96	95	-4	-5	16	25
109	109	9	9	81	81	96	94	-4	-6	16	36
108	109	8	9	64	81	94	94	-6	-6	36	36
108	109	8	9	64	81	94	94	-6	-6	36	36
108	109	8	9	64	81	94	94	-6	-6	36	36
107	108	7	8	49	64	93	93	-7	-7	49	49
107	108	7	8	49	64	91	92	-9	-8	81	64
106	108	6	8	36	64	91	92	-9	-8	81	64
106	108	6	8	36	64	90	90	-10	-10	100	100
106	108	6	8	36	64	90	90	-10	-10	100	100
106	108	6	8	36	64	90	89	-10	-11	100	121
106	108	6	8	36	64	90	89	-10	-11	100	121

TABLE X Continued

X (1)	Y (2)	X-100 (3)	Y-100 (4)	X^2 (5)	Y^2 (6)	X (1)	Y (2)	X-100 (3)	Y-100 (4)	X^2 (5)	Y^2 (6)
89	89	-11	-11	121	121		72		-28		784
88	88	-12	-12	144	144		72		-28		784
88	87	-12	-13	144	169		71		-29		841
87	87	-13	-13	169	169		71		-29		841
87	86	-13	-14	169	196		71		-29		841
87	86	-13	-14	169	196		70		-30		900
87	86	-13	-14	169	196		70		-30		900
86	86	-14	-14	196	196		69		-31		961
85	86	-15	-14	225	196		65		-35		1225
85	86	-15	-14	225	196		64		-36		1296
84	85	-16	-15	256	225		64		-36		1296
82	85	-18	-15	324	225		63		-37		1369
82	85	-18	-15	324	225		63		-37		1369
82	85	-18	-15	324	225		62		-38		1444
82	84	-18	-16	324	256		56		-44		1936
81	84	-19	-16	361	256		54		-46		2116
81	84	-19	-16	361	256		44		-56		3136
80	84	-20	-16	400	256		42		-58		3364
80	84	-20	-16	400	256						
79	84	-21	-16	441	256						
79	81	-21	-19	441	361						
77	81	-23	-19	529	361						
77	81	-23	-19	529	361						
77	80	-23	-20	529	400						
76	80	-24	-20	576	400						
76	80	-24	-20	576	400						
75	80	-25	-20	625	400						
75	79	-25	-21	625	441						
74	77	-26	-23	676	529						
73	76	-27	-24	729	576						
73	76	-27	-24	729	576						
72	76	-28	-24	784	576						
71	76	-29	-24	841	576						
71	76	-29	-24	841	576						
69	75	-31	-25	961	625						
68	74	-32	-26	1024	676						
66	74	-34	-26	1156	676						
63	74	-37	-26	1369	676						
63	73	-37	-27	1369	729						
62	73	-38	-27	1444	729						
52	73	-48	-27	2304	729						
	73		-27		729						
TOTAL							129	148	Σ-81	Σ-746	Σ48799 Σ61004

TABLE XI

FREQUENCY OF SCORES OF GRADE-POINT-AVERAGES GROUP X AND GROUP Y USING ARBITRARY ORIGIN FOR COMPUTING NUMBERS TO BE USED IN "t" TEST OF SIGNIFICANCE

X (1)	Y (2)	X-2 (3)	Y-2 (4)	X^2 (5)	Y^2 (6)
3.86	3.97	1.86	1.97	3.4596	3.8809
3.69	3.70	1.69	1.70	2.8561	2.8900
3.65	3.64	1.65	1.64	2.7225	2.6896
3.43	3.56	1.43	1.56	2.0449	2.4336
3.42	3.53	1.42	1.53	2.0164	2.3409
3.35	3.52	1.35	1.52	1.8225	2.3104
3.29	3.51	1.29	1.51	1.6641	2.2801
3.27	3.51	1.27	1.51	1.6129	2.2801
3.24	3,48	1.24	1.48	1.5376	2.1904
3.21	3.48	1.21	1.48	1.4641	2.1904
3.18	3.46	1.18	1.46	1.3924	2.1316
3.17	3.46	1.17	1.46	1.3689	2.1316
3.15	3.44	1.15	1.44	1.3225	2.0736
3.15	3.40	1.15	1.40	1.3225	1.9600
3.12	3.40	1.12	1.40	1.2544	1.9600
3.11	3.34	1.11	1.34	1.2321	1.7956
3.08	3.25	1.08	1.25	1.1664	1.5625
3.06	3.25	1.06	1.25	1.1236	1.5625
3.06	3.24	1.06	1.24	1.1236	1.5376
3.06	3.24	1.06	1.24	1.1236	1.5376
3.03	3.21	1.03	1.21	1.0609	1.4641
3.02	3.21	1.02	1.21	1.0404	1.4641
3.02	3.18	1.02	1.18	1.0404	1.3924
3.02	3.18	1.02	1.18	1.0404	1.3924
3.00	3.17	1.00	1.17	1.0000	1.3689
2.97	3.10	.97	1.10	.9409	1.2100
2.94	3.08	.94	1.08	.8836	1.1664
2.94	3.05	.94	1.05	.8836	1.1025
2.87	3.05	.87	1.05	.7569	1.1025
2.83	3.02	.83	1.02	.6889	1.0404
2.81	3.00	.81	1.00	.6561	1.0000
2.80	2.97	.80	.97	.6400	.9409
2.75	2.97	.75	.97	.5625	.9409
2.73	2.90	.73	.90	.5329	.8100
2.72	2.85	.72	.85	.5184	.7225
2.71	2.84	.71	.84	.5041	.7056
2.60	2.83	.60	.83	.3600	.6889
2.59	2.81	.59	.81	.3481	.6561
2.59	2.80	.59	.80	.3481	.6400
2.51	2.79	.51	.79	.2601	.6241
2.45	2.78	.45	.78	.2025	.6084
2.45	2.78	.45	.78	.2025	.6084

TABLE XI Continued

X (1)	Y (2)	X-2 (3)	Y-2 (4)	X^2 (5)	Y^2 (6)
2.43	2.78	.43	.78	.1849	.6084
2.43	2.75	.43	.75	.1849	.5625
2.41	2.73	.41	.73	.1681	.5329
2.40	2.72	.40	.72	.1600	.5184
2.40	2.67	.40	.67	.1600	.4489
2.40	2.65	.40	.65	.1600	.4225
2.39	2.62	.39	.62	.1521	.3844
2.37	2.60	.37	.60	.1369	.3600
2.36	2.54	.36	.54	.1296	.2916
2.35	2.51	.35	.51	.1225	.2601
2.33	2.51	.33	.51	.1089	.2601
2.28	2.51	.28	.51	.0784	.2601
2.27	2.48	.27	.48	.0729	.2304
2.24	2.48	.24	.48	.0576	.2304
2.24	2.47	.24	.47	.0576	.2209
2.22	2.44	.22	.44	.0484	.1936
2.22	2.43	.22	.43	.0484	.1849
2.21	2.43	.21	.43	.0441	.1849
2.21	2.42	.21	.42	.0441	.1764
2.21	2.40	.21	.40	.0441	.1600
2.20	2.40	.20	.40	.0400	.1600
2.19	2.37	.19	.37	.0361	.1369
2.18	2.36	.18	.36	.0324	.1296
2.17	2.34	.17	.34	.0289	.1156
2.17	2.33	.17	.33	.0289	.1089
2.17	2.32	.17	.32	.0289	.1024
2.17	2.29	.17	.29	.0289	.0841
2.15	2.29	.15	.29	.0225	.0841
2.12	2.28	.12	.28	.0144	.0784
2.11	2.24	.11	.24	.0121	.0576
2.10	2.23	.10	.23	.0100	.0529
2.09	2.21	.09	.21	.0081	.0441
2.08	2.18	.08	.18	.0064	.0324
2.05	2.18	.05	.18	.0025	.0324
2.00	2.18	.00	.18	.0000	.0324
1.96	2.18	-.04	.18	.0016	.0324
1.94	2.16	-.06	.16	.0036	.0256
1.94	2.12	-.06	.12	.0036	.0144
1.91	2.11	-.09	.11	.0081	.0121
1.90	2.10	-.10	.10	.0100	.0100
1.88	2.10	-.12	.10	.0144	.0100
1.88	2.10	-.12	.10	.0144	.0100

TABLE XI Continued

X (1)	Y (2)	X-2 (3)	Y-2 (4)	X^2 (5)	Y^2 (6)
1.87	2.08	-.13	.08	.0169	.0064
1.85	2.05	-.15	.05	.0225	.0025
1.82	2.05	-.18	.05	.0324	.0025
1.81	2.00	-.19	.00	.0361	.0000
1.77	1.97	-.23	-.03	.0529	.0009
1.74	1.97	-.26	-.03	.0676	.0009
1.74	1.96	-.26	-.04	.0676	.0016
1.72	1.94	-.28	-.06	.0784	.0036
1.70	1.91	-.30	-.09	.0900	.0081
1.70	1.89	-.30	-.11	.0900	.0121
1.66	1.88	-.34	-.12	.1156	.0144
1.65	1.83	-.35	-.17	.1225	.0289
1.65	1.82	-.35	-.18	.1225	.0324
1.64	1.81	-.36	-.19	.1296	.0361
1.64	1.81	-.36	-.19	.1296	.0361
1.63	1.81	-.37	-.19	.1369	.0361
1.60	1.78	-.40	-.22	.1600	.0484
1.59	1.78	-.41	-.22	.1681	.0484
1.54	1.77	-.46	-.23	.2116	.0529
1.48	1.77	-.52	-.23	.2704	.0529
1.39	1.71	-.61	-.29	.3721	.0841
1.33	1.66	-.67	-.34	.4489	.1156
1.31	1.65	-.69	-.35	.4761	.1225
1.27	1.64	-.73	-.36	.5329	.1296
1.21	1.63	-.79	-.37	.6241	.1369
1.20	1.61	-.80	-.39	.6400	.1521
1.16	1.61	-.84	-.39	.7056	.1521
1.14	1.45	-.86	-.55	.7396	.3025
1.13	1.45	-.87	-.55	.7569	.3025
1.12	1.42	-.88	-.58	.7744	.3364
1.11	1.40	-.89	-.60	.7921	.3600
1.10	1.38	-.90	-.62	.8100	.3844
1.06	1.38	-.94	-.62	.8836	.3844
.97	1.35	-1.03	-.65	1.0609	.4225
.96	1.32	-1.04	-.68	1.0816	.4624
.96	1.27	-1.04	-.73	1.0816	.5329
.95	1.24	-1.05	-.76	1.1025	.5776
.93	1.24	-1.07	-.76	1.1449	.5776
.81	1.21	-1.19	-.79	1.4161	.6241
.62	1.21	-1.38	-.79	1.9044	.6241
.54	1.20	-1.46	-.80	2.1316	.6400
.48	1.13	-1.52	-.87	2.3104	.7569
.44	1.13	-1.56	-.87	2.4336	.7569
.39	1.06	-1.61	-.94	2.5921	.8836
.36	1.05	-1.64	-.95	2.6896	.9025

TABLE XI Continued

X (1)	Y (2)	X-2 (3)	Y-2 (4)	X^2 (5)	$\overline{Y^2}$ (6)
	1.03		-.97		.9409
	1.00		-1.00		1.0000
	.97		-1.03		1.0609
	.96		-1.04		1.0816
	.94		-1.06		1.1236
	.91		-1.09		1.1881
	.87		-1.13		1.2769
	.86		-1.14		1.2996
	.86		-1.14		1.2996
	.82		-1.18		1.3924
	.81		-1.19		1.4161
	.75		-1.25		1.5625
	.68		-1.32		1.7424
	.67		-1.33		1.7689
	.65		-1.35		1.8225
	.60		-1.40		1.9600
	.48		-1.52		2.3104
	.42		-1.58		2.4964
	.36		-1.64		2.6896
TOTAL N=129		N=148	Σ19.31	Σ26.08	Σ82.2481	Σ113.7280

SECTION III

FINDINGS

The "t" Probability Scale

The table of "t" Probability Scale (from R. A. Fisher's Table IV) abridged by Edwards[1] indicated that there was a significant difference between the mean scores, on the ACE Tests, thus indicating a significant difference in ability. The table as set forth is limited to 1,000 degrees of freedom and in the writer's study 300 degrees of freedom were used. Edward's table is reproduced and is referred to as Table XII page 31, in this section.

At 300 degrees of freedom, Fisher's table would indicate significant difference with a "t" value of 1.968 at the 5% level. This indicated that the probability of these sets of scores being from the same population is less than 5%, a risk we are willing to assume. Since the writer obtained a value of "t" 2.473 the two sets of scores are not from the same population, therefore, the two means on the ACE Test scores, are significantly different indicating difference in ability of the two groups.

The same technique was used in finding significant difference for grade-point-averages. At 300 degrees of freedom, Fisher's table would indicate significant difference with a "t" value of 1.968 at the 5% level. The writer obtained a "t" value of 1.415 and found that it was not significant at the 5% level. Normally the research worker would feel that the evidence was not strong enough to cause him to accept the Null Hypothesis, but would hold it in the back of his mind, that further research might add to solving the study.

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1. Allen L. Edwards, Statistical Analysis for Students of Psychology and Education. New York, Rinehart and Company, Inc., 1946. p. 330.

TABLE XII

VALUES OF "t" AT THE 5% AND 1% LEVELS OF SIGNIFICANCE

DEGREES OF FREEDOM	5%	1%	DEGREES OF FREEDOM	5%	1%
1	12.706	63.657	32	2.037	2.739
2	4.303	9.925	34	2.032	2.728
3	3.182	5.841	36	2.027	2.718
4	2.776	4.604	38	2.021	2.711
5	2.571	4.032	40	2.021	2.704
6	2.447	3.707	42	2.017	2.696
7	2.365	3.499	44	2.015	2.691
8	2.306	3.355	46	2.012	2.685
9	2.262	3.250	48	2.010	2.681
10	2.228	3.169	50	2.008	2.678
11	2.201	3.106	55	2.005	2.668
12	2.179	3.055	60	2.000	2.660
13	2.160	3.012	65	1.998	2.653
14	2.145	2.977	70	1.994	2.648
15	2.131	2.947	80	1.990	2.638
16	2.120	2.921	90	1.987	2.632
17	2.110	2.898	100	1.984	2.626
18	2.101	2.878	125	1.979	2.616
19	2.093	2.861	150	1.976	2.609
20	2.086	2.845	200	1.972	2.601
21	2.080	2.831	300	1.968	2.592
22	2.074	2.819	400	1.966	2.588
23	2.069	2.807	500	1.965	2.586
24	2.064	2.797	1000	1.962	2.581
25	2.060	2.787		1.960	2.576
26	2.056	2.779			
27	2.052	2.771			
28	2.048	2.763			
29	2.045	2.756			
30	2.042	2.750			

Edward's table referred to in Section III, is abridged from Table IV of Fisher. It is reproduced in this report as Table XII, shown above.

Summary

In summary the "t" Probability Scale indicated that there was a significant difference between the mean scores of groups X and Y on the ACE Test, thus indicating a significant difference in ability, between them. Group X then, is that group of students that have the same vocational choices and preferences, and according to the value of "t" they have more mental ability than Group Y, that group that is undecided or failed to make a vocational choice or preference. The "t" value of 2.473 is located between the 5% and 1% levels of freedom and shows significant difference, indicating more mental ability in Group X. On the preceding page, Table XII shows the 5% and 1% levels of freedom.

For the grade-point-averages, the "t" Probability Scale indicated that there was no significant difference at the 5% level. The "t" value here of 1.415 actually lies below the 1% level, and is not tenable at the level of significance the writer had agreed upon. This means that Group X and Group Y are about the same in scholastic achievement, as measured by grade-point-averages, with a slight edge going to Group Y, that group that failed to make definite vocational choices and preferences. It is the writer's opinion that further research might reveal a more significant difference between these groups.

SECTION IV

SUMMARY AND CONCLUSIONS

General Summary Statement

The purpose of this section is to re-state briefly the findings of the study. In this study the writer had as his objective to determine if the more capable students in terms of better scholastic ability had made their vocational choices as they began their college work and to determine the degree to which those students who had made definite vocational choices or expressed very definitely their vocational preferences early in their college work, achieved better or less well than those who had not such choices.

In determining the extent of ability and success of the groups of students involved, both the mean and the standard deviations were first computed. Group X, then, was that group that did list vocational choices and preferences on the ACE Test and Application For Admission blanks at State College. Group Y, then, was that group that was undecided and failed to list any vocational preferences or choices on the same blanks. After complete computation of the means and standard deviations, the "t" test of significance was used. In determining the amount of significant difference between the two means, of ACE Test scores and grade-point-average scores, the table of "t" Probability Scale from Fisher's table indicated that there was a significant difference in ability between the mean scores of the two groups. This test revealed that the two means for group X and Y on the ACE Test scores were significantly different, since a "t" value of 2.473 was obtained.

The "t" test of significance was given to the mean scores of both Groups X and Y, on-grade-point averages. Again using Fisher's table

the "t" value of 1.415 indicated no significant difference in scholastic achievement between Groups X and Y. This means that those students in the Group X category had better mental ability but achieved almost the same as the Group Y students, with a slight edge in scholastic achievement going to Group Y, thus indicating to the writer that further research might reveal a more significant difference between these groups.

Conclusions Drawn From the Study

In conclusion it is to be re-stated that there was a significant difference between the mental ability of Group X on one hand and Group Y on the other, according to the mean test scores on the ACE Test. There was no difference between the two groups in comparison on their grade-point-averages. Certain generalizations from this study are indicated below.

1. Students who have shown better mental ability, by ACE Test results, are more consistent in choosing their vocational choices and preferences.

2. Actually more of these students who show better mental ability are still enrolled in college.

3. Students who have the desire to work hard, while at college, can upset ACE Test results and receive average or better than average grades.

4. It is the belief of this writer that ACE Test scores serve as an indication of a student's future success.

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Application for Admission

SOUTH DAKOTA STATE COLLEGE
College Station, South Dakota

Office of Admissions and Records Date _____ 19____

I hereby apply for admission to South Dakota State College

Fall ☐ Winter ☐ Spring ☐ Summer ☐ 19____
and submit the following information:

1. Name (print) _____ Sex M____ F____
Last First Middle

2. Home Address _____

3. Age in Years ____ Date of Birth _____ Place of Birth _____

4. From what high school did you graduate _____ Year _____

5. Have you ever attended any College or University? _____
(Inaccurate information may be grounds for refusal or dismissal)

Give school or schools with dates of attendance _____

_____

6. Name of Parent (or guardian) _____

7. His (or Her) Address _____

8. What Curriculum do you plan to enter? _____
(see list of curricula on back)

9. If you graduated from high school earlier than the Spring previous to your entering this College, make a complete chronological statement as to your employment (with approximate dates, location and nature of the work). This information, with that you gave on line 5 should account fully for the period since your graduation from high school. This information must be given in detail.

10. You are responsible for having your credits filed with the Director of Admission and Records. Your application is not complete until your credits are on file.

Complete these forms and return to Director of Admissions and Records

DO NOT DETACH

SOUTH DAKOTA STATE COLLEGE
Brookings, South Dakota

PROCEDURES FOR ADVANCED ROOM RESERVATIONS IN COLLEGE DORMITORIES

Because enrollment exceeds the capacity at State College dormitories, the College recognizes priority for the groups listed below and within these groups requires a deposit from each student before a room is assigned.

Women students now residing in the dormitories and prospective students who are residents of the State of South Dakota are given priority in the women's dormitories. In the men's dormitories freshman students who are residents of the State of South Dakota are given first priority and sophomore students are given next priority if rooms are available.

Each applicant must remit $10.00 to the Comptroller of the College with his Agreement and Application for room reservation in one of the College dormitories. This is held by the Comptroller as a deposit subject to the following procedure:

> If rooms are available, applicant will be so notified by one of the College dormitory Directors and a room will be assigned. The $10.00 is held throughout the year as a deposit against damage to the student's rooms. At the end of the year such damage as has been done to the room is charged against this deposit and the remaining part is returned to the student.
> The $10.00 deposit is not refundable unless a valid written excuse for withdrawal is given and approved by the Director of Student Housing or unless, for some reason the student is not admitted to the College.
> **A valid excuse requires a situation whereby a student is prevented from enrolling by extenuating circumstances beyond his control.**
> Requests for return of the deposit postmarked after August 15th will be given no consideration except in cases of most extreme emergency.

In order that a freshman student be assured of dormitory housing his deposit must be in the hands of the Comptroller of the College by August 1st, accommodations after this date will be made providing there are any dormitory spaces available.

Deposit Agreement and Application for Advanced Room Reservation

I, _____, hereby apply for advanced reservation for a room in one of the _____
(Please Print) (Men's Women's)
College Dormitories for the quarter commencing _____, and I enclose $10.00 payable to South Dakota State College. This constitutes a deposit under the terms stated above.

Class in college _____, _____, _____, _____.
Fr. Soph. Jr. Sr.

_____ _____
Date Name

_____
Home Address in Full

Send the $10.00 deposit with the application.

RECORD TO BE FILLED IN BY THE COLLEGE

_____
Date Received

ACCEPTED: _____
Date

Not accepted and
Deposit Returned _____
Date

Other Actions:
Hall Assigned _____
Date

Room Assigned _____
Date

PERSONNEL INFORMATION BLANK

Division of Student Personnel, South Dakota State College

Before you fill out this Personnel blank, it is recommended that you confer with your high school principal or superintendent to discuss plans for your continued training and education. Experience has shown that the quality of work done in high school is a good indication of the student's success in college.

This information blank must be filled in by each new student in his own handwriting in ink before he registers in South Dakota State College. It will be observed that this blank calls for considerable information relative to the interests, ideals, and past experiences of the student. The completion of this form serves three purposes: (1) to stimulate students to think carefully about their college plans; (2) to acquaint parents and teachers with some of the problems and difficulties which confront students in the transition from high school to college; and (3) to secure as far in advance as possible such information as will enable the college officials to counsel and advise with students how best to anticipate some of the problems of a college course. At the same time the completion of this blank will impress upon students the sincere desire of South Dakota State College to aid well-prepared, serious-minded, ambitious, and responsible high school graduates in making their plans for college work.

The information contained in this blank will be treated in a strictly professional manner.

Important: The applicant will attach here a small unmounted photograph if available.

(1-23) Name (Print) _____
(Last) (First) (Middle)

Home address: Street _____

(24-26) High School _____

(27-29) City _____

(30-32) County _____

(33-34) State _____

PERSONAL AND FAMILY DATA

35) Size of community from which I come (check appropriate space)

___0. From a farm ___1. From a town of less than 2,500 ___2. From a town of 2,500 to 20,000 ___3. From a city of over 20,000

Place of birth _____ Date of birth _____ (36-37) Age _____

38) Sex ___0. Male ___1. Female. Citizen of what country _____ Race _____ Ancestry _____

39) Church preference:

___0. Baptist
___1. Catholic
___2. Christian Science
___3. Church of God
___4. Congregational
___5. Episcopal
___6. Lutheran
___7. Methodist
___8. Presbyterian
___9. Other (List) _____

(40) Are you a church member? Yes___ No___

41) Marital status:
___0. Single
___1. Married
___2. Separated
___3. Divorced

(42) Veteran status:
___0. Veteran
___1. Non-veteran

(43) Number of brothers ___Older ___Younger

(44) Number of sisters ___Older ___Younger

Parents data:	Father	Mother
Name in full		
Address		
Place of birth		
Citizen of what country		
Ancestory (Nationality)		
Health		
Living (or deceased date)	(45)	(46)
Language spoken at home		
Occupation (be specific)	(47)	(48)
Education (last grade attended)	(49)	(50)

51) Parents' marital status: ___0. Living together ___1. Separated ___2. Divorced ___3. Remarried

Name and address of legal guardian, if any _____

52) If home is broken, with whom do you now make your home? ___0. Father ___1. Mother ___2. Other (give name, address, and relationship) _____

M--3-55--2668

EDUCATIONAL DATA

(53) Division in which you plan to enroll at South Dakota State College.

___0. Agriculture
___1. Engineering
___2. Science and Applied Arts
___3. Home Economics
___4. Pharmacy, Nursing E
___5. General Registration decided), Pre-profess

(54-55) Date of graduation from high school _____
(month) (year)

(56) Standing in high school senior class with regard to scholarship:

___0. Upper quarter
___1. Upper middle quarter
___2. Lower middle quarter
___3. Lower quarter

(57) Honors and awards for scholarship in high school:

___0. Valedictorian
___1. Salutatorian
___2. National Honor Society
___3. Honor Roll
___4. DAR award
___5. Boys State
___6. Girls State
___7. Other (specify)

Give name of school, town, state, and dates of attendance of each high school attended.

Name of High School	Town and State	Dates of

What other plans (besides attending South Dakota State College) have you considered? _____

Names of relatives attending or having attended SDSC. Give relationship and approximate date of attendance _____

Colleges or special schools attended (including special training in art, music, etc.)

Name of School or College	City and State	C

(58) Influences which directed you to enter South Dakota State College:

___0. Parents attended State
___1. Friends attended State
___2. Closest college to home
___3. Discussions with family
___4. 4-H or F.F.A. Club contacts
___5. High School Press Association Contacts
___6. Visits to college in past two years
___7. Talks with high school instructors
___8. Information from college day c
___9. Talks with college staff memb
___x. Other (specify) _____

(59) Mark with an X the general courses in high school liked best. *Underline* specific courses. (See list of courses below)

(60) Mark with an 0 the general courses in high school liked least. *Underline* specifics. (Use same list.)

___0. Foreign language (French, German, Latin, Spanish)
___1. History (World, American, Civics)
___2. Mathematics (Algebra, Advanced Algebra, Geometry, Trigonometry, Solid Geometry)
___3. Science (General, Biology, Botany, Chemistry, Physics)
___4. Social Science (Government, Economics, Sociology, Guidance)
___5. Commercial (Typing, Shorthand, Bookkeeping, Commercial Law, Business Mathematics)
___6. Vocational (Agriculture, Home Economics, Shop, Mechanical Drawing, Printing)
___7. English (Composition, Literature, Grammar)
___8. Other (Specify) _____

Courses failed or dropped in high school or college (indicate whether failed or dropped)

Course	Year	Reason for failure or drop

List names of magazines read regularly by you. 1._____ 2._____ 3.___

List last three books read for pleasure. 1._____ 2._____ 3.___

VOCATIONAL DATA

Have you chosen your vocation? _____ (61-62) If so, name it _____

Give the reasons for your choice (Please answer fully and carefully) _____

Name in order of your preference three occupations you have considered or are considering a life work, and tell why you are or were interested in each.

Occupation	Reason for interest	Now interested?
1.		
2.		
3.		

(63-64) If you were free to choose any activity in the world, what would you like most to do? _____

(65) Work experience prior to coming to college:

___0. Farming ___1. Clerk in store ___2. Stenographic ___3. House work ___4. Selling ___5. Mechanic ___6. Newspaper ___7. Truck driver ___8. Odd jobs ___9. Other (specify) _____

What did you like or dislike about any of the above jobs? _____

Have you consulted any public counseling service for assistance on your educational or vocational plans? ____. If so, give name and address of the agency. _____

What advice was given to you by the counselor in the above agency? _____

(66) Have you talked with others concerning your educational and vocational plans?

___0. No ___1. Friends ___2. Members of family ___3. High school teachers ___4. Others (specify) _____

What has been their general opinion of your plans? _____

Are your parents able and willing to help you go to college? _____ If not, explain the difficulty. _____

(67-72) Rate in order of preference (1, 2, 3) the three occupations which you would like to see yourself in ten years from now.

___00. Accountant
___01. Actor
___02. Advertising man
___03. Agriculture teacher
___04. Architect
___05. Artist
___06. Author-journalist
___07. Aviator
___08. Bacteriologist
___09. Banker
___10. Botanist
___11. Buyer
___12. Carpenter
___13. Certified public accountant
___14. Chemist
___15. Civil engineer
___16. College professor
___17. Contractor
___18. County Agent
___19. Dentist
___20. Dietician
___21. Editor
___22. Electrical engineer
___23. Electrician
___24. Elementary teacher
___25. English teacher
___26. Explorer
___27. Farmer
___28. Forest service man
___29. Home Ec teacher
___30. Housewife
___31. Judge
___32. Laboratory technician
___33. Lawyer
___34. Librarian
___35. Life insurance salesman
___36. Mathematician
___37. Math, Phys. Science teacher
___38. Mechanic
___39. Mechanical engineer
___40. Merchant
___41. Minister
___42. Musician
___43. Nurse
___44. Office manager
___45. Office worker
___46. Osteopath
___47. Personnel director
___48. Pharmacist
___49. Photographer
___50. Physical Education teacher
___51. Physicist
___52. Physician
___53. Policeman
___54. Politician
___55. Printer
___56. Production manager
___57. Psychologist
___58. Public administrator
___59. Purchasing agent
___60. Rancher
___61. Real estate salesman
___62. Sales manager
___63. School superintendent
___64. Service officer
___65. Social science H. S. teacher
___66. Social worker
___67. Stenographer-secretary
___68. YMCA secretary
___69. YMCA physical director
___70. YWCA secretary
___71. Zoologist
___72. Other (specify) _____

SOCIAL, EXTRA CURRICULAR AND RELIGIOUS

Mark with an X those activities below in which you were a leader or officer. Mark with an 0 those activities in which you were an active participant.

(73)

___0. Football ___1. Basketball ___2. Baseball ___3. Softball ___4. Track ___5. Golf ___6. Tennis ___7. Swimming ___8. Pep Squad ___9. Boxing

(74)

___0. Student government ___1. Dramatics ___2. Debate or Speech ___3. Library ___4. Newspaper ___5. Annual ___6. Glee Club ___7. Band ___8. Chorus ___9. Orchestra

(75)

___0. Grange ___1. FFA or FHA ___2. FTA ___3. Boy or Girl Scouts ___4. 4-H Club ___5. Church groups ___6. YMCA or YWCA ___7. N. F. L. ___8. Quill and Scroll ___9. Other (specify) _____

Which activities (both in and out of school) did you enjoy most? _____

In what activities did you have little or no interest? _____

In what activities would you like to engage in college? _____

List your hobbies or special interests _____

If you are changing your residence to attend South Dakota State College, do you desire to become associated with a church in Brookings? ___

Name members of State College faculty with whom you are acquainted _____

FINANCIAL

How much do you expect the total cost (including board, room, and all expenses) of a year in college will be? $_____

(76) Financial arrangements have been made to the extent that:

___0. All expenses can be paid.
___1. Most expenses can be paid.
___2. Some expenses can be paid.
___3. Very little expense can be paid.

(77) How much time do you expect to spend in outside work during the first year of college?

___0. Do not plan to work.
___1. Up to ten hours per week.
___2. Between ten and twenty hours per week.
___3. More than twenty hours per week.

HEALTH DATA

(78) How would you classify your condition of health during the past two years?

___0. Excellent
___1. Above average
___2. Average
___3. Below average
___4. Poor

If you consider your health to be below average explain your reasons: _____

(79) Indicate below any physical disability:

___0. Loss of arm
___1. Loss of hand
___2. Loss of finger
___3. Loss of leg
___4. Eye defect
___5. Hearing defect
___6. Speech defect
___7. Epilepsy
___8. Heart disorder
___9. Other (specify) _____

(80) During your last year in school, approximately how much time was lost due to illness?

___0. None
___1. Less than one week
___2. From one to two weeks
___3. From two weeks to a month
___4. More than a month

MILITARY SERVICE STATEMENT

1. Do you have an honorable discharge? _____. Rank at time of discharge ____. With what branch did you serve? _____

2. Dates of active service from _____ to _____

Geographical areas of service: _____

4. If you have attended Service schools for which you wish to receive college credit have a transcript sent to the Registrar.

AFFIDAVIT

Are you willing to abide by the College rules? _____

Students whose homes are not in Brookings are required to room in the college dormitories or other approved rooming places. Attendance at college is a privilege. In order to safeguard the ideals of scholarship and the moral atmosphere which are necessary in taining high standards, the College reserves the right to require the withdrawal of any student whose presence is detrimental to the b terests of the student body, whenever this becomes evident.

I, _____, agree to comply with the regulations and requirements of South Dakota State College cooperate with the authorities and my fellow students to maintain high standards of conduct and scholarship. It is understood accept registration as a student in South Dakota State College subject to the above provisions.

Date _____ (Signature) _____

(Signature of parent or guardian) _____

Write a statement of your purpose in coming to college. Include a biographical sketch giving additional information of your life, e ences, hobbies, plans and ideals.

Appendix B

AMERICAN COUNCIL ON EDUCATION

Psychological Examination

For College Freshmen

Prepared by L. L. Thurstone and Thelma Gwinn Thurstone

744 Jackson Place, Washington 6, D. C.

General Instructions

This examination is different from the ordinary school examinations to which you have been accustomed. The plan for each of these tests is as follows. First, you are given detailed *instructions* about the test, so that you know just what you are expected to do. Then you have some *practice problems*. Then you go to the *test proper*. This is the procedure for each of the six tests in this examination. The total examination requires an hour.

The six tests in this examination represent a variety of tasks. Three of them involve thinking of a quantitative sort, while the other three require more linguistic ability. If you find one test hard, do not be discouraged. You may find the next test easier. But you should do your best on all the tests.

People differ markedly in the speed with which they can do these different tests. The tests are long enough to keep everyone busy for the whole time, and you are not expected to complete the tests in the time allowed. By noting how many questions you can answer in a certain length of time, we can determine your speed on each kind of test. You must begin to work on a test promptly when the examiner calls the starting time and stop immediately when he says: "Stop." Do not begin a test until the examiner gives the starting signal for that particular test. Do not turn back to a test after the time for it has expired. You are to work on each test during, and only during, the specified time as announced by the examiner in charge.

You are to record your answers on a separate answer sheet rather than on the pages of the test booklet. Instead of writing down your answers in the usual manner, you will record each answer by blackening the space between a pair of lines. *Do not make any marks or record any answers on the pages of this test booklet.*

Your answer sheet will be scored accurately if you observe carefully the following directions:

1. On the answer sheet, find the *section* which corresponds to the practice problems or test proper on which you are working.
2. Then find the *row of answer spaces* which is numbered the same as the question you are answering.
3. Then find the *pair of dotted lines* which corresponds to the answer you choose and blacken the space. MISPLACED ANSWERS ARE COUNTED AS WRONG ANSWERS.
4. Indicate each answer with SOLID BLACK PENCIL MARKS drawn vertically between the two dotted lines. Solid black marks are made by going over each mark two or three times and by pressing firmly on the pencil.
5. Make your marks as long as the dotted lines.
6. If you change your answer, erase your first mark completely.
7. Make no unnecessary marks in or around the dotted lines.
8. Keep your answer sheet on a hard surface while marking your answers.
9. Make no folds or creases in the answer sheets.
10. No *scratch paper* is allowed in any of these tests. The answer sheet contains a special section which may be used for scribbling.
11. Fold the pages of your test booklet back so that *only one page is visible*. Place the test booklet to the left. Keep the answer sheet under the test booklet so that the answer spaces being marked are as close as possible to the questions being answered.

(Omit the next paragraph unless the tests are to be machine-scored.)

The examination will be scored by an electric test-scoring machine, which makes use of the fact that a solid black pencil mark will carry a current of electricity in the same way that a copper wire does LIGHT PENCIL MARKS MADE WITH A HARD PENCIL WILL NOT CARRY A CURRENT OF ELECTRICITY! The machine will not give you a correct score unless you indicate your answers with solid black pencil marks made with the *special* pencil which is provided. Do not use any pencil other than the special one provided. The machine cannot distinguish between intended answers and stray pencil marks. If you are careless in erasing, or if you leave unnecessary marks on or near the pairs of lines, such marks may be counted by the machine as wrong answers so that your score will be lower than it should be.

Wait until the examiner gives the starting signal for the first set of practice problems.

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Arithmetic

PRACTICE PROBLEMS

In this test you will be given some problems in arithmetic. After each problem there are five answers, but only one of them is the correct answer. You are to solve each problem and blacken the space on the answer sheet which corresponds to the answer you think is correct. The following problem is an example.

1. How many pencils can you buy for 50 cents at the rate of 2 for 5 cents?
(a) 10 (b) 20 (c) 25 (d) 100 (e) 125

Find on the answer sheet the space labeled "ARITHMETIC, Practice Problems, Page 3." The correct answer to the problem is 20, which is answer (b).

In the row numbered 1, space (b) has been blackened.

In the *second* row, blacken the space which corresponds to the answer to the second practice problem.

2. If James had 4 times as much money as George, he would have $16. How much money has George?
(a) $4 (b) $8 (c) $12 (d) $16 (e) $64

You should have blackened space (a), which corresponds to $4, the correct answer.

Blacken the spaces corresponding to the answers to the following problems:

3. In 5 days Harry has saved a dollar. What has his average daily saving been?
(a) 20¢ (b) 22½¢ (c) 25¢ (d) 30¢ (e) 40¢

4. John sold 4 magazines at 5 cents each. He kept ½ the money and with the other ½ he bought papers at 2 cents each. How many did he buy?
(a) 3 (b) 4 (c) 5 (d) 6 (e) 10

When the signal is given (not yet), turn the page and work more problems of the same kind. Work rapidly and accurately. Your rating will be the total number of correct answers. You may not be able to finish in the time allowed.

Stop here. Wait for the signal.

1946 Edition

Find the correct answer to each problem below. Then blacken the corresponding space on the answer sheet.

ARITHMETIC

1. Mr. Smith had 12 rowboats to rent. He bought 3 new boats and then sold 6 of his old ones. How many boats did he have left?
   (a) 3 (b) 6 (c) 9 (d) 12 (e) 15

2. A man bought stocks for $100. He sold them for $120, gaining $4 per share. How many shares were there?
   (a) 1 (b) 2 (c) 4 (d) 5 (e) 10

3. A file case has 21 drawers numbered from 1 to 21. The even-numbered drawers average 80 cards to the drawer. What is the total number of cards in the even-numbered drawers?
   (a) 800 (b) 880 (c) 960 (d) 1,000 (e) 1,680

4. Nora wishes to save enough money to buy a hat for $6 and an umbrella for $4. How many days must she work at $2 a day to have enough, if she has to spend $3 of her total earnings for carfares and lunches?
   (a) 1½ (b) 5 (c) 6½ (d) 10 (e) 13

5. William is 6 years old, and his sister is twice as old. When William is 9, what will be the age of his sister?
   (a) 6 (b) 9 (c) 12 (d) 15 (e) 18

6. How many one-inch cubes can be placed in a box 4 inches wide, 6 inches long, and 2 inches deep?
   (a) 12 (b) 24 (c) 48 (d) 72 (e) 96

7. A merchant bought chairs at $24 a dozen; in selling them he received as much for 2 chairs as he had paid for 3 chairs. What was the selling price per dozen?
   (a) $25 (b) $30 (c) $33 (d) $36 (e) $48

8. What will it cost Mr. Brown to borrow $3,500 at 6% interest for 2 years and 8 months?
   (a) $540 (b) $560 (c) $600 (d) $620 (e) $640

9. If a strip of cloth 24 inches long will shrink to 22 inches when washed, how many inches long will a 36-inch strip be after shrinking?
   (a) 30 (b) 32 (c) 33 (d) 34 (e) 35

10. If the fire insurance rate is $.20 per $100, what will the premium be for insuring a house valued at $20,000 for 80% of its value?
    (a) $30 (b) $32 (c) $33 (d) $34 (e) $36

11. For every 3 marbles Tom has, Jack has 5. If they have 96 marbles between them, how many has Jack?
    (a) 24 (b) 36 (c) 48 (d) 60 (e) 72

12. A recipe for ice cream calls for 1 part cream to 1½ parts whole milk. If 1½ pints of cream are used, how many pints of whole milk should be used?
    (a) 1 (b) 1½ (c) 2¼ (d) 2½ (e) 3

13. Mrs. Brown found that from 6 pints of fruit juice and 4 pints of sugar she got 8 pints of jelly. How many pints of sugar will she need to make 2 dozen half-pint glasses of jelly?
    (a) 6 (b) 8 (c) 10 (d) 12 (e) 24

14. Carl and Richard receive $2.00 for delivering magazines. Carl delivers 42, Richard 28. How much should Carl receive?
    (a) $.40 (b) $.60 (c) $.80 (d) $1.20 (e) $1.40

15. At a meeting of 30 people a motion was carried by a majority of 6. How many voted against the measure?
    (a) 6 (b) 9 (c) 12 (d) 18 (e) 21

16. If a wire 20 inches long is to be cut so that one piece is ⅔ as long as the other piece, how many inches long must the shorter piece be?
    (a) 4 (b) 5 (c) 6 (d) 7 (e) 8

17. When a coal bin is ⅚ full, the coal is worth $120. What is the value of the coal when the bin is ¼ full?
    (a) $24 (b) $25 (c) $30 (d) $36 (e) $40

18. A boy, by mistake, multiplied a fraction by 3 instead of dividing it by 3. He gave the answer as ⅔. What was the correct answer?
    (a) 2/27 (b) ⅓ (c) 1⅓ (d) 2 (e) 6

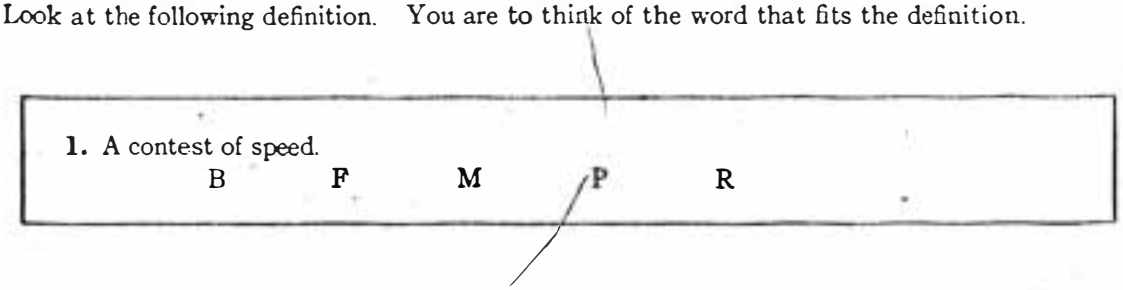
19. A man spent ⅓ of his monthly salary for meals and ¼ of the remainder for incidental expenses. What per cent of his salary did he have left?
    (a) 20 (b) 35 (c) 41⅔ (d) 50 (e) 83⅓

20. A family uses ⅘ of a barrel of flour in a month. What fraction of a month will ⅔ of a barrel last them?
    (a) 7/15 (b) 8/15 (c) ¾ (d) ⅚ (e) 6/5

Completion

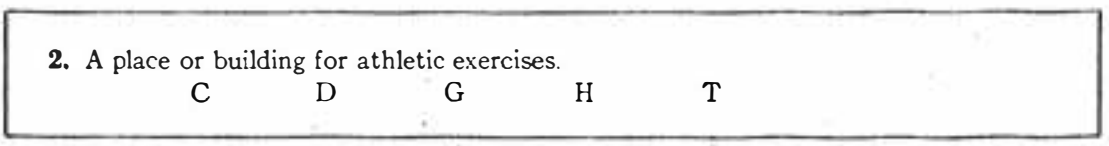
PRACTICE PROBLEMS

Look at the following definition. You are to think of the word that fits the definition.



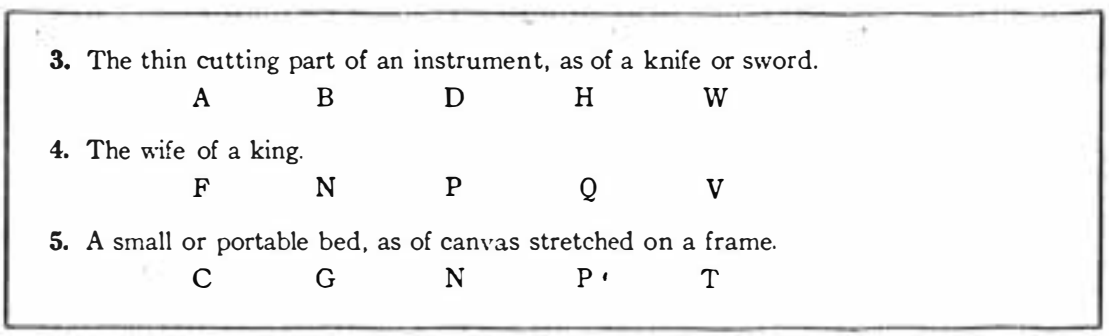
The word is *race*. The letter *R* is the first letter in the word *race*. In the section of the answer sheet labeled "COMPLETION, Practice Problems, Page 5," the space indicated by *R* in the first row has been blackened.

Blacken the space corresponding to the first letter of the word which fits the following definition.



The word is *gymnasium*. You should have marked the space indicated by *G* because it is the first letter in the word *gymnasium*.

Do the following examples in the same way:



When the starting signal is given (not yet), turn the page and work more problems of the same kind. Work rapidly because your rating will be the total number of correct answers. You may not be able to finish in the time allowed.

Stop here. Wait for the signal.

Think of the word that fits the definition. Then mark the first letter of that word on the answer sheet.

COMPLETION

1. The residential districts on the outskirts of a city.
   F K N S V

2. The chief magistrate of a city.
   A C K M W

3. The withdrawal, especially when forced, of troops from the presence of an enemy.
   B C L R T

4. A strip of material used in dressing wounds.
   B C E F H

5. One skilled in treating diseases and injuries of animals.
   R S T U V

6. The company of seamen who man a ship.
   B C D M W

7. The hard creamy-white dentine composing elephants' tusks.
   A E I O U

8. A leather case for a pistol.
   B E H P S

9. The part of a military force that serves on horseback.
   C D F G I

10. A pendant mass of ice formed from dripping water.
    A E I O U

11. The glass over a watch dial.
    B C D E F

12. A stony or metallic body fallen to earth from outer space.
    I J K L M

13. A meeting of spiritualists to receive communications.
    C F G P S

14. A young deer.
    A E F O T

15. A present given to pervert judgment.

16. The right or act of voting in political matters.
    J N S T W

17. Repetition of the same sound at the beginning of consecutive words.
    A B C D E

18. The act of fabricating or falsely producing a writing or instrument.
    B D F H J

19. A representation of the outlines of an object filled in with some uniform color.
    G L N S W

20. A small pie, often open-faced.
    R T U V W

21. A receiver of stolen goods.
    F I M O R

22. The base or support of a statue.
    G H N O P

23. One-fourth of a pint.
    A B E F G

24. A state of balance between opposing forces.
    A C E F G

25. A large basket, usually with a cover.
    F G H K L

26. A car attached to a locomotive to carry fuel and water.
    S T U V W

27. That point of the heavens which is vertically above one.
    N U W Y Z

28. The science of sound.
    A B C D E

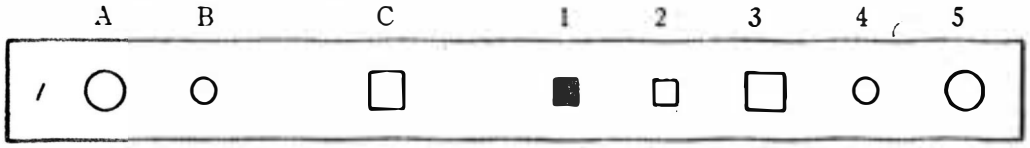
29. A trough with a handle for carrying mortar.
    D H K N R

30. A turkey cock.

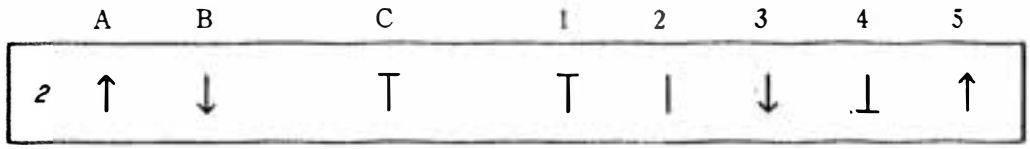
Figure Analogies

PRACTICE PROBLEMS

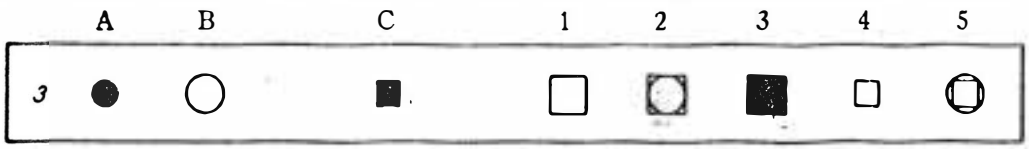
Look at the figures A, B, and C in Sample 1 below. Figure A is a large circle. Figure B is a small circle. By what rule is Figure A changed to make Figure B? The rule is "making it smaller." Now look at Figure C. It is a large square. What will it be if you change it by the same rule? It will be a small square of the same color as the large square. Figure 2 is a small white square. In the section of the answer sheet labeled "FIGURE ANALOGIES, Practice Problems, Page 7," the space numbered 2 in the first row has been blackened to indicate the correct answer.



In Sample 2 below, the rule is: "Turn Figure A upside down to make Figure B." Now look at Figure C and think how it would look when turned upside down. It would look like Figure 4. The space numbered 4 has already been blackened on the answer sheet.



In Sample 3 below, the rule has two parts: "Make Figure B of the opposite color and larger than Figure A." Apply the rule to Figure C and blacken the space which corresponds to the correct answer.

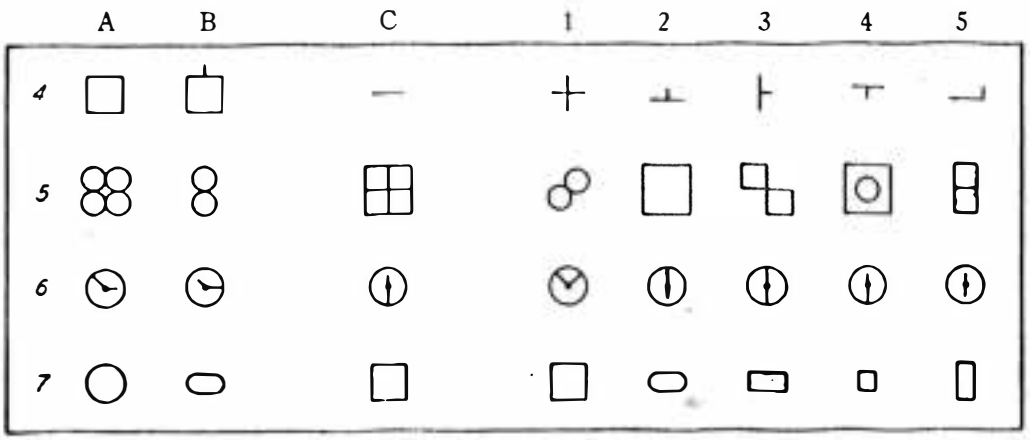


You should have blackened the space numbered 1, which corresponds to the large white square.

Notice that the rule changes from one example to another. You are to do four things to each exercise on this page and the next.

a. Decide what rule is used to change Figure A to Figure B.
b. Apply this rule to Figure C.
c. Select the resulting figure from the five figures at the right.
d. Blacken the space on the answer sheet which is numbered the same as the figure you have selected

Proceed to the four exercises below, marking your answers on the answer sheet. Go ahead.



Stop here. Wait for the signal.

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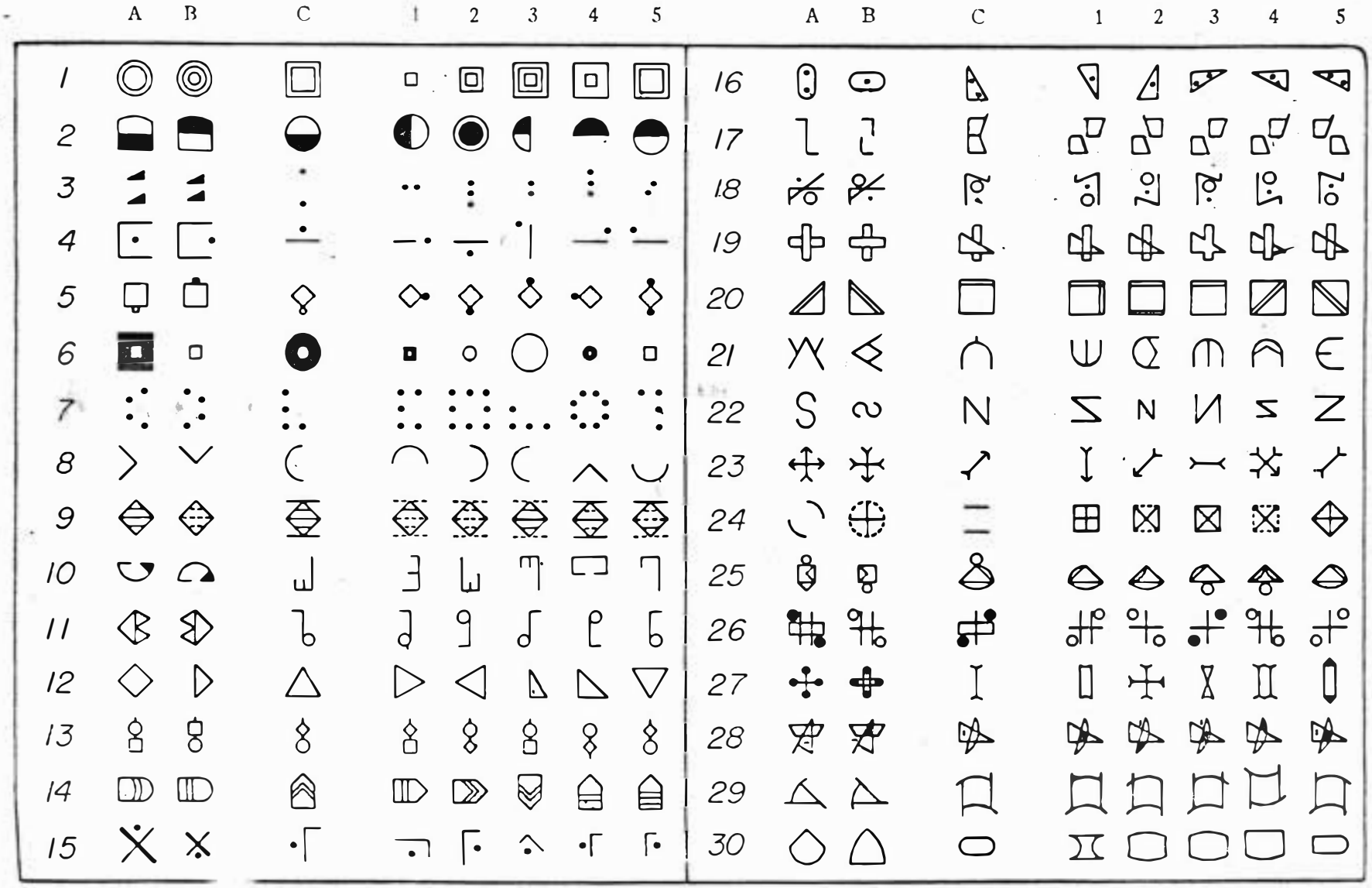
FIGURE ANALOGIES

In each line below, find the rule by which Figure A is changed to make Figure B. Apply the rule to Figure C. Select the resulting figure at the right and blacken the corresponding answer space.



Same-Opposite

PRACTICE PROBLEMS

The word at the left in the following line is "many."

1. many	(1) ill	(2) few	(3) down	(4) sour

One of the four words at the right means either the *same* as or the *opposite* of "many." The word "few," which is numbered 2, is the opposite of "many." In the section of the answer sheet labeled "SAME-OPPOSITE, Practice Problems, Page 9," space number 2 in the first row has been blackened.

The word at the left in the second example is "ancient." Select one of the four words at the right that means the *same* as or the *opposite* of "ancient." In the second row on the answer sheet, blacken the space which corresponds to the answer you have selected.

2. ancient	(1) dry	(2) long	(3) happy	(4) old

You should have blackened the space numbered 4, because 4 corresponds to "old," which means the same as "ancient."

In each of the following lines select the word that means the *same* as or the *opposite* of the word at the left. On the answer sheet, blacken the space which corresponds to the answer you have selected.

3. deep	(1) blue	(2) shallow	(3) tense	(4) watery
4. awkward	(1) clumsy	(2) loyal	(3) passive	(4) young
5. hot	(1) dry	(2) cooked	(3) red	(4) cold

When the starting signal is given (not yet), turn the page and work more problems of the same kind. Work rapidly because your rating will be the total number of correct answers. You may not be able to finish in the time allowed.

Stop here. Wait for the signal.

In each row select the word at the right which means the *same* as or the *opposite* of the first word in the row. Blacken the space which corresponds to the word you have selected.

SAME–OPPOSITE

1. exclusive	(1) fanatical	(2) unrestricted	(3) exultant	(4) urban
2. firm	(1) fervid	(2) cold	(3) loose	(4) feudal
3. submissive	(1) stretched	(2) untidy	(3) frank	(4) defiant
4. felonious	(1) prime	(2) wicked	(3) brainy	(4) placid
5. beneficial	(1) artificial	(2) tamable	(3) detrimental	(4) piquant
6. admissible	(1) indelible	(2) lateral	(3) morbid	(4) unacceptable
7. intact	(1) broken	(2) destructive	(3) tactful	(4) agile
8. premature	(1) late	(2) primitive	(3) material	(4) decisive
9. orderly	(1) liberal	(2) methodical	(3) elective	(4) unfair
10. gallant	(1) boorish	(2) bright	(3) costly	(4) main
11. rapturous	(1) athwart	(2) perennial	(3) rampant	(4) ecstatic
12. pliable	(1) dominant	(2) inflexible	(3) metallic	(4) ignorant
13. maximal	(1) fashionable	(2) mean	(3) medium	(4) minimal
14. clamorous	(1) glamorous	(2) random	(3) prompt	(4) vociferous
15. dolorous	(1) sonorous	(2) sorrowful	(3) delirious	(4) pretty
16. wily	(1) fresh	(2) sullen	(3) crafty	(4) deep
17. lacerated	(1) disgruntled	(2) mangled	(3) fringed	(4) stricken
18. opaque	(1) academic	(2) transparent	(3) obsolete	(4) earnest
19. rigid	(1) endurable	(2) sterile	(3) limp	(4) floral
20. reciprocal	(1) mutual	(2) residual	(3) defective	(4) conditioned
21. steadfast	(1) irresolute	(2) hungry	(3) consequential	(4) buoyant
22. capricious	(1) frugal	(2) callous	(3) medicinal	(4) whimsical
23. exuberant	(1) effusive	(2) factorial	(3) gory	(4) toxic
24. arrogant	(1) powerful	(2) good	(3) elegant	(4) humble
25. ostentatious	(1) surgical	(2) bony	(3) mythical	(4) pretentious
26. abject	(1) acrid	(2) forlorn	(3) ancient	(4) young
27. meticulous	(1) unwieldy	(2) tense	(3) nervous	(4) slovenly
28. copious	(1) scant	(2) original	(3) scathed	(4) injurious
29. turbid	(1) faithful	(2) dire	(3) partial	(4) muddy
30. diurnal	(1) notable	(2) daily	(3) pompous	(4) spotless
31. impervious	(1) impolite	(2) peevish	(3) impossible	(4) penetrable
32. corpulent	(1) obscene	(2) frivolous	(3) obese	(4) dead
33. conventional	(1) convenient	(2) unusual	(3) religious	(4) intrinsic
34. demented	(1) grievous	(2) sorry	(3) delinquent	(4) mad
35. resilient	(1) rested	(2) silent	(3) inelastic	(4) nominal
36. tawdry	(1) yellow	(2) short	(3) macabre	(4) garish
37. gregarious	(1) gruesome	(2) healthful	(3) solitary	(4) instinctive
38. dulcet	(1) right	(2) first	(3) slavish	(4) melodious
39. recumbent	(1) upright	(2) glorious	(3) social	(4) repetitive
40. propitious	(1) unfavorable	(2) temporary	(3) shrewd	(4) paltry
41. facetious	(1) factitious	(2) jocular	(3) terse	(4) liquid
42. remiss	(1) docile	(2) negligent	(3) incurable	(4) mistaken
43. assiduous	(1) drastic	(2) conciliatory	(3) easy	(4) diligent
44. spurious	(1) especial	(2) false	(3) neat	(4) trivial
45. apocryphal	(1) authentic	(2) jubilant	(3) innocent	(4) curved
46. unctuous	(1) stingy	(2) lively	(3) gruff	(4) prior
47. captious	(1) important	(2) stout	(3) hypercritical	(4) boyish
48. fulgent	(1) rancid	(2) tolerant	(3) amiable	(4) shining
49. fortuitous	(1) hardy	(2) cowardly	(3) casual	(4) calamitous
50. quizzical	(1) comical	(2) slow	(3) questionable	(4) cautious

Stop here.

Number Series

PRACTICE PROBLEMS

The numbers in each series proceed according to some rule. For each series you are to find the *next number*.

In the first series below, each number is 2 larger than the preceding number. The *next number* in the series would be 14. Of the five answers at the right, answer (e) is, therefore, correct. In the section of the answer sheet labeled "NUMBER SERIES, Practice Problems, Page 11," space (e) in the first row has been blackened.

	Series						*Next Number*				
1.	**2**	**4**	**6**	**8**	**10**	**12**	**10** (a)	11 (b)	12 (c)	13 (d)	**14** (e)

Find the rule in the series below, and blacken one of the answer spaces in the second row on the answer sheet.

2.	20	19	18	17	16	15	10 (a)	12 (b)	14 (c)	15 (d)	16 (e)

Each number in this series is 1 less than the preceding number. You should have blackened space (c), which corresponds to 14, the next number in the series.

Find the rule in the series below, and blacken the space on the answer sheet which corresponds to the next number.

3.	10	8	11	9	12	10	9 (a)	10 (b)	11 (c)	12 (d)	13 (e)

The series above goes by alternate steps of subtracting 2 and adding 3. You should have blackened space (e), which corresponds to 13, the next number.

In each series below, find the rule and blacken the space on the answer sheet which corresponds to the next number. There is a different rule for each series. Go right ahead. Do not wait for any signal.

4.	8	11	14	17	20	23	10 (a)	13 (b)	23 (c)	25 (d)	**26** (e)
5.	27	27	23	23	19	19	15 (a)	16 (b)	17 (c)	18 (d)	**19** (e)
6.	16	17	19	20	22	23	18 (a)	20 (b)	22 (c)	24 (d)	25 (e)

When the starting signal is given (not yet), turn the page and work more problems of the same kind. Work rapidly because your rating will be the total number of correct answers. You may not be able to finish in the time allowed.

Stop here. Wait for the signal.

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Find the rule in each problem below and blacken the space which corresponds to the next number.

NUMBER SERIES

1.	9	9	9	8	8	8	7	4 (a)	5 (b)	6 (c)	7 (d)	8 (e)
2.	7	11	15	19	23	27	31	34 (a)	35 (b)	36 (c)	37 (d)	38 (e)
3.	25	28	24	27	23	26	22	18 (a)	19 (b)	22 (c)	25 (d)	26 (e)
4.	11	15	14	18	17	21	20	19 (a)	21 (b)	23 (c)	24 (d)	27 (e)
5.	31	30	32	30	33	30	34	26 (a)	30 (b)	34 (c)	38 (d)	39 (e)
6.	68	72	36	40	20	24	12	6 (a)	16 (b)	20 (c)	24 (d)	28 (e)
7.	19	21	24	17	19	22	15	8 (a)	11 (b)	12 (c)	16 (d)	17 (e)
8.	17	15	18	14	19	13	20	11 (a)	12 (b)	14 (c)	27 (d)	28 (e)
9.	86	78	70	62	54	46	38	28 (a)	30 (b)	32 (c)	34 (d)	36 (e)
10.	12	10	8	16	14	12	20	12 (a)	14 (b)	16 (c)	18 (d)	22 (e)
11.	12	3	13	4	14	5	15	5 (a)	6 (b)	7 (c)	16 (d)	17 (e)
12.	4	5	7	10	14	19	25	28 (a)	29 (b)	30 (c)	31 (d)	32 (e)
13.	94	92	46	44	22	20	10	4 (a)	5 (b)	8 (c)	12 (d)	14 (e)
14.	17	19	16	20	15	21	14	18 (a)	19 (b)	20 (c)	21 (d)	22 (e)
15.	25	22	11	33	30	15	45	15 (a)	41 (b)	42 (c)	48 (d)	135 (e)
16.	42	45	15	18	6	9	3	1 (a)	3 (b)	6 (c)	9 (d)	12 (e)
17.	4	7	8	7	10	11	10	6 (a)	9 (b)	11 (c)	13 (d)	14 (e)
18.	8	5	15	18	6	3	9	3 (a)	6 (b)	7 (c)	9 (d)	12 (e)
19.	40	42	21	24	8	12	3	4 (a)	6 (b)	7 (c)	8 (d)	9 (e)
20.	10	12	14	12	14	16	14	12 (a)	14 (b)	16 (c)	18 (d)	20 (e)
21.	13	16	20	24	29	34	40	41 (a)	42 (b)	44 (c)	45 (d)	46 (e)
22.	35	28	4	11	77	70	10	4 (a)	17 (b)	63 (c)	70 (d)	77 (e)
23.	42	35	29	24	20	17	15	12 (a)	13 (b)	14 (c)	15 (d)	16 (e)
24.	12	10	20	22	11	9	18	2 (a)	9 (b)	14 (c)	20 (d)	36 (e)
25.	4	5	7	4	8	13	7	0 (a)	13 (b)	14 (c)	15 (d)	16 (e)
26.	4	5	7	7	14	15	17	17 (a)	18 (b)	19 (c)	24 (d)	34 (e)
27.	49	51	54	27	9	11	14	7 (a)	16 (b)	17 (c)	18 (d)	28 (e)
28.	4	8	16	8	16	32	24	12 (a)	16 (b)	24 (c)	32 (d)	48 (e)
29.	7	5	10	7	21	17	68	61 (a)	62 (b)	63 (c)	64 (d)	65 (e)
30.	64	32	35	5	22	11	14	1 (a)	2 (b)	9 (c)	17 (d)	31 (e)

Verbal Analogies

PRACTICE PROBLEMS

Read the following words:

1. foot-shoe hand- (1) thumb (2) head (3) glove (4) finger

The first two words, *foot-shoe*, are related. The next word is *hand*. It can be combined with one of the remaining words in the row so as to make a similar pair, *hand-glove*. In the section of the answer sheet labeled "VERBAL ANALOGIES, Practice Problems, Page 13," space number 3 in the first row has been blackened.

Read the following words:

2. father-son mother- (1) aunt (2) sister (3) child (4) daughter

The first pair is *father-son*. The next word is *mother*. It can be combined with the word *daughter* to make the similar pair, *mother-daughter*. In the second row on the answer sheet, blacken space number 4, which corresponds to the word *daughter*.

In each row of words, the first two words form a pair. The third word can be combined with another word to form a similar pair. Select the word which completes the second pair. On the answer sheet, blacken the space which corresponds to the word you select.

3. sky-blue grass- (1) green (2) sod (3) path (4) blue

4. ice-solid water- (1) hard (2) fire (3) iron (4) liquid

In the third row on the answer sheet, you should have blackened space number 1, which corresponds to *green*. In the fourth row, you should have blackened space number 4, which corresponds to *liquid*.

Select the answers to the following problems and blacken the corresponding spaces on the answer sheet. Go right ahead. Do not wait for any signal.

5. ear-music nose- (1) face (2) perfume (3) breath (4) tone

6. cloth-dye house- (1) shade (2) paint (3) brush (4) door

7. green-grass yellow- (1) silver (2) color (3) golden (4) gold

8. cattle-hay man- (1) eat (2) bread (3) water (4) life

When the starting signal is given (not yet), turn the page and work more problems of the same kind. Work rapidly because your rating will be the total number of correct answers. You may not be able to finish in the time allowed.

Stop here. Wait for the signal.

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In each row, select the word which completes the second pair. Blacken the space which corresponds to the word you have selected.

VERBAL ANALOGIES

1.	mayor-city	president-	(1) king	(2) ruler	(3) empire	(4) nation
2.	convict-prison	bird-	(1) penitentiary	(2) thief	(3) robin	(4) cage
3.	find-lose	remember-	(1) memory	(2) forget	(3) recall	(4) reflect
4.	introduction-conclusion	birth-	(1) baby	(2) childhood	(3) life	(4) death
5.	war-codes	football-	(1) strategy	(2) coach	(3) signals	(4) quarterback
6.	monument-dedicate	ship-	(1) champagne	(2) transport	(3) convoy	(4) christen
7.	distance-inch	weight-	(1) troy	(2) scales	(3) pound	(4) balance
8.	iron-rust	wood-	(1) paint	(2) steel	(3) decay	(4) crack
9.	wealth-pauper	intelligence-	(1) capitalist	(2) genius	(3) idiot	(4) beggar
10.	peace-war	calm-	(1) quiet	(2) striving	(3) storm	(4) sea
11.	man-automobile	baby-	(1) carriage	(2) bottle	(3) mother	(4) crib
12.	mouse-elephant	minnow-	(1) rhinoceros	(2) perch	(3) whale	(4) ocean
13.	discuss-conclude	ponder-	(1) decide	(2) refuse	(3) hesitate	(4) confer
14.	water-swim	ice-	(1) run	(2) hockey	(3) frozen	(4) skate
15.	doctor-nurse	warden-	(1) patient	(2) criminal	(3) guard	(4) prisoner
16.	walking-crutch	vision-	(1) blindness	(2) oculist	(3) lens	(4) dog
17.	religion-convert	army-	(1) chaplain	(2) general	(3) recruit	(4) deserter
18.	letter-seal	door-	(1) bolt	(2) hinge	(3) knob	(4) panel
19.	man-doctor	car-	(1) garage	(2) designer	(3) manufacturer	(4) mechanic
20.	locomotive-rails	bus-	(1) wheels	(2) tires	(3) road	(4) rubber
21.	visitor-quarantine	driver-	(1) stop light	(2) pedestrian	(3) passenger	(4) mechanic
22.	automobile-brake	boat-	(1) oar	(2) rudder	(3) anchor	(4) motor
23.	wave-crest	mountain-	(1) altitude	(2) snow	(3) slope	(4) peak
24.	almost-entire	probable-	(1) all	(2) certain	(3) likely	(4) possible
25.	siren-warning	beacon-	(1) rotation	(2) warning	(3) airplane	(4) darkness
26.	wool-sheep	fur-	(1) coat	(2) cat	(3) birds	(4) furrier
27.	church-heresy	army-	(1) attack	(2) mutiny	(3) discipline	(4) command
28.	rudder-sail	steering wheel-	(1) crankshaft	(2) piston	(3) gasoline	(4) engine
29.	blindness-color	deafness-	(1) hearing	(2) loud	(3) audition	(4) tone
30.	dress-belt	hat-	(1) band	(2) feather	(3) brim	(4) crown
31.	age-youth	dowager-	(1) matron	(2) bachelor	(3) aristocrat	(4) debutante
32.	goose-pillow	calf-	(1) rug	(2) shoe	(3) curtain	(4) hide
33.	secular-religious	temporal-	(1) holy	(2) eternal	(3) temporary	(4) reverent
34.	alms-charity	beg-	(1) offer	(2) plead	(3) pay	(4) pauper
35.	revision-book	alteration-	(1) garment	(2) style	(3) change	(4) pamphlet
36.	infinite-finite	universe-	(1) essential	(2) planet	(3) final	(4) cosmos
37.	knight-armor	car-	(1) engine	(2) chromium	(3) bumper	(4) wheels
38.	circle-sphere	square-	(1) figure	(2) rectangle	(3) cube	(4) solid
39.	grain-bread	ore-	(1) rail	(2) smelter	(3) copper	(4) mine
40.	sip-gulp	mist-	(1) torrent	(2) cloud	(3) sleet	(4) haze

Stop here.