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ABSTRACT

A second follow-up of students in five cities in 1947 who had taken the Differential Aptitude Tests is reported. Questionnaires were sent out to 2,386 individuals, and replies were received from 1,430. Their Differential Aptitude Test scores were converted to standard scores with a mean of 50 and a standard deviation of 10, based upon the original population of 2,900. The results are shown in tables. Table 1 shows the percentiles equivalent to the mean scores in relation to subsequent education; Table 2 shows the results by type of education for persons attaining college degrees; and Table 3 reports percentiles for those occupations listed by 20 or more persons and for three groups not currently employed. Overlap among contrasting groups--groups differing in subsequent education or in level of later occupation--is illustrated in two figures. The results of the second follow-up show that the characteristics of high school students, measured by the Differential Aptitude Tests, bear important relations to their subsequent careers, as reported eight years later. (For related document, see TM 002 945.) (DB)

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THE *D.A.T.*—A SEVEN-YEAR FOLLOW-UP

IN 1951 the authors of the *Differential Aptitude Tests* reported on a longitudinal or "follow-up" study of high school students tested in 1947.* These students came from schools in six cities where the *DAT* had been used in 1947 and where it seemed feasible to attempt to regain contact with the high school graduates some four years later.

During 1954-55 five of these cities — Ann Arbor, Michigan; Jackson, Michigan; St. Paul, Minnesota; Dover, New Jersey; and Mount Vernon, New York — cooperated in a second follow-up.† Questionnaires were sent out to 2,386 individuals, and replies were received from 1,430, or 59 per cent. As in the previous study their 1947 *Differential Aptitude Test* scores have been converted to standard scores with a mean of 50 and a standard deviation of 10 based upon the original population of 2,900 high school students in these six cities.

Once again, those who answered the questionnaire tended to be very slightly superior to those who failed to reply. Regardless of the test, the mean of those replying is elevated by about one-tenth of a standard deviation while those not replying fall a similar distance below the average of the entire group.

Table 1 shows the percentiles equivalent to the mean scores in relation to subsequent education. It will be observed that those who have attained college degrees are markedly superior on all tests to the average of the high school groups of which they were a part. This superiority is most pronounced in Verbal Reasoning, Numerical Ability, and the grammatical section of Language Usage. Among women, perhaps because a smaller proportion of women go on to college, this superiority is somewhat greater than is the case for men. However, the 41 men who attained advanced degrees are definitely superior to those who attained undergraduate degrees. Unfortunately, so few women, only 6, reported graduate degrees that no comparison of the sexes is here possible. Persons attending but not completing college are superior to the high school population but considerably less so than those who attain degrees. Men who attended special schools rather than college are close to average on some tests but inferior in Numerical Ability, Spelling, and grammar (Sentences). Women attending special schools are not markedly different from the average of high school girls. Those persons who ended their education with a high school diploma tend to be slightly below average, this tendency being more marked among men than among women.

Table 2 shows the results by type of education for persons attaining college degrees. The liberal arts and science groups are comprised of persons with high scores in Verbal Reasoning, Numerical Ability, Spelling, and Sentences. Men who graduated from technical courses (chiefly engineering) have high test scores in Numerical Ability, Space Relations, and Mechani-

*Bennett, G. K., Seashore, H. G., and Wesman, A. G. "Aptitude testing: does it 'prove out' in counseling practice?" *Occupations*, 1952, 30, 584-593, and reported in condensed form in the 1952 Manual of the *Differential Aptitude Tests*, pp. 59-62.

†This project entailed considerable effort by administrators, research staffs, and counselors in each city. Their generous cooperation is gratefully acknowledged.

TABLE 1. Percentile Equivalents of Average Scores of Students Tested in 1947 in Relation to Educational Attainment by 1955.

GROUP	N	Percentiles							
		VR	NA	AR	SR	MR	CSA	Spell.	Sent.
MEN									
Advanced Degree	41	86	84	76	61	66	75	82	87
College Graduate*	214	79	79	73	67	68	71	74	78
Some College	179	61	57	60	57	56	58	60	57
Special School†	97	40	31	46	46	49	49	33	31
No Further Education	178	34	30	36	42	43	38	35	32
WOMEN									
College Graduate	122	84	84	78	70	70	67	76	82
Some College	128	70	66	68	64	64	57	63	64
Special School†	120	55	49	54	54	49	49	46	45
No Further Education	399	42	40	43	49	50	51	49	40

*Includes those with advanced degrees.

†Non-degree-granting institutions. Most of the men attended business, technical, or fine arts schools; the majority of women went to secretarial, nursing, or fine arts schools.

cal Reasoning. Men earning degrees in education show no superiority in Space Relations or Mechanical Reasoning, while on these tests the business administration group is somewhat superior to the high school population. Because of the small number of women attending college, comparison is possible only between the liberal arts and the education groups. It will be seen that a slightly greater degree of superiority is displayed by the women recipients of liberal arts degrees.

Even with so large an initial population, the number of persons engaging in a given occupation tends to be fairly small. Table 3 reports percentiles for those occupations listed by twenty or more persons. It will be seen that the engineers are decidedly superior on all tests and particularly so on Numerical Ability, Abstract Reasoning, and Mechanical Reasoning.

The businessmen tend to be below average in Space Relations and Mechanical Reasoning but slightly superior on the other tests. Factory operatives and unskilled laborers are below average in Numerical Ability and the language skills, and the factory operatives seem to have their best relative strength in Space Relations and Mechanical Reasoning. Foremen tend to be above average in Clerical Speed and Accuracy.

The lower portion of Table 3 shows the corresponding information for women employed as teachers, nurses, secretaries, and clerks. Teachers are, by and large, the highest scoring group. Nurses are slightly less outstanding except in Space Relations, where they surpass the teachers. The secretary-stenographer group is somewhat above the average of all high school students, with the high point in their profile occurring in Spelling. Those employed as clerks fall just below the average of their high school classes but attain their best scores in Clerical Speed and Accuracy.

Table 3 includes data for three groups not currently employed: 107 men reported that they were now students; 132 men indicated that they were members of the military services; 277 women reported themselves as housewives. The current male students are superior to the high school population but less so than those who have already attained degrees. The military group is significantly above the average of the high school class and also above the average of those who four years earlier were in the armed forces. This may be due to the fact that some of the present military persons stayed out of the service until they had completed further education. Those women who reported themselves as married in 1951 were above average on some tests and below on others. Those currently indicating their career as that of housewife are slightly superior to the high school female population, reflecting the fact that quite a few of the college students of 1951 are now housewives.

The foregoing discussion has been confined to comparisons of average performance. It is also interesting

TABLE 2. Percentile Equivalents of Average Scores of Students Tested in 1947 in Relation to Types of Post-High-School Courses Pursued or Completed by 1955.

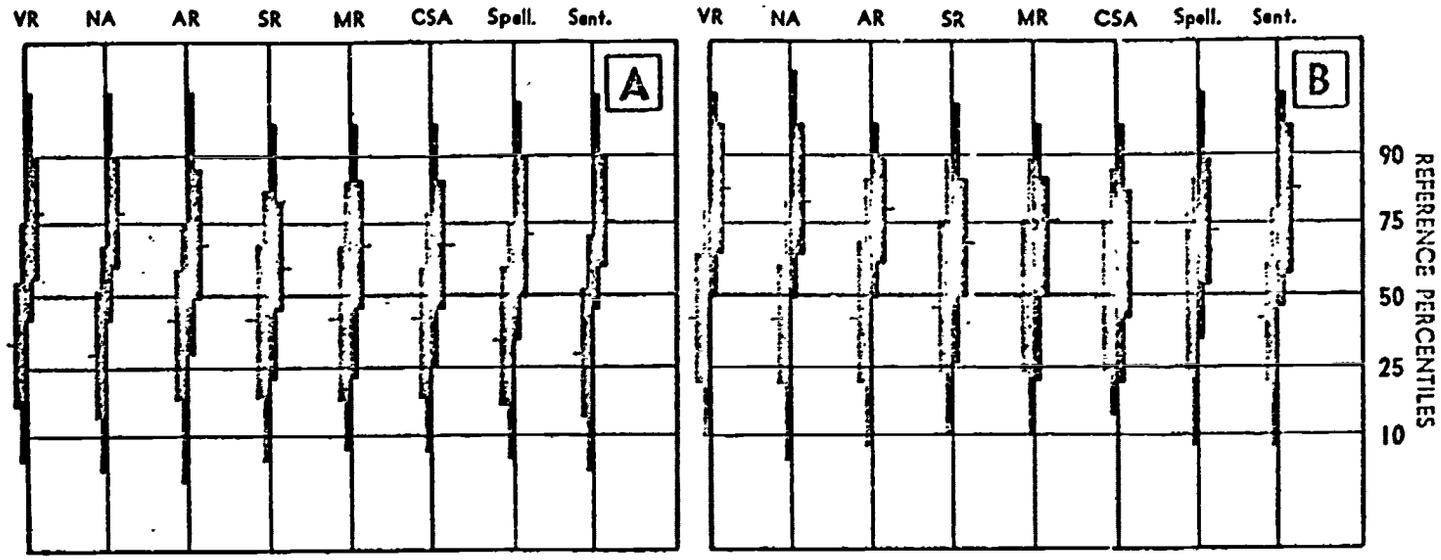
GROUP	N	Percentiles							
		VR	NA	AR	SR	MR	CSA	Spell.	Sent.
MEN									
DEGREE EARNED									
Liberal Arts	77	81	76	76	65	64	71	77	84
Science	36	81	82	70	68	74	75	80	75
Technical*	53	79	87	78	77	82	70	68	70
Education	21	72	70	65	50	43	73	72	73
Business Administration	29	73	68	59	61	61	64	68	64
INCOMPLETE PROGRAM									
Liberal Arts	56	64	55	62	48	51	60	66	61
Business Administration	54	52	51	55	49	48	61	56	52
Technical*	53	68	66	65	76	73	54	58	61
NON-DEGREE PROGRAM									
Technical	62	37	26	43	42	49	47	28	27
WOMEN									
DEGREE EARNED									
Liberal Arts	53	86	87	80	69	68	68	82	86
Education	48	80	79	78	72	73	68	71	81
INCOMPLETE PROGRAM									
Liberal Arts	65	75	68	69	66	64	58	69	70
NON-DEGREE PROGRAM									
Commercial	78	54	47	52	49	45	49	46	45
Technical	39	54	52	54	61	54	47	44	42

*Chiefly Engineering.

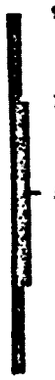
TABLE 3. Percentile Equivalents of Average Scores of Students Tested in 1947 in Relation to Occupational Field in 1955.

GROUP	N	Percentiles							
		VR	NA	AR	SR	MR	CSA	Spell.	Sent.
MEN									
Engineers	22	84	89	86	81	86	74	79	81
Draftsmen	21	47	47	50	67	53	61	44	51
Technicians	49	42	45	45	48	53	51	37	34
Businessmen	21	57	58	54	36	45	64	58	55
Salesmen	39	56	49	58	50	52	55	55	49
Clerks	46	39	41	46	50	43	45	47	46
Supervisors-Foremen	21	43	44	43	52	46	69	48	35
Factory Workers	37	43	27	34	52	54	28	29	32
Building Tradesmen	21	32	33	45	50	38	43	35	27
Laborers	24	38	21	28	29	35	32	36	25
Students (Current)	107	76	74	72	62	63	68	72	76
Military Personnel	132	67	67	63	64	64	58	64	66
WOMEN									
Teachers	49	81	84	81	74	71	73	72	82
Nurses	28	78	75	73	77	64	58	70	66
Stenographers	126	58	56	54	52	52	61	67	56
Clerks	198	46	45	48	48	49	52	46	40
Housewives	277	57	50	55	59	58	52	54	52

FIGURE 1. ***Differential Aptitude Test*** **Scores and Subsequent Education**



COMPARISONS OF SCORES OF HIGH SCHOOL STUDENTS WHO DID NOT PURSUE FURTHER EDUCATION AND THOSE WHO ATTAINED COLLEGE DEGREES. Chart A contrasts males who report college degrees with those who have undertaken no post-high-school education. Chart B supplies corresponding information for women. It can be seen that in the case of Verbal Reasoning, Numerical Ability, and Sentences about 90 per cent of those who subsequently attain college degrees are drawn from the top half of the high school population. At the same time, an appreciable proportion of boys (about 30 per cent) and an even greater percentage of girls (about 45 per cent) who did not continue in school displayed aptitudes in the same range.

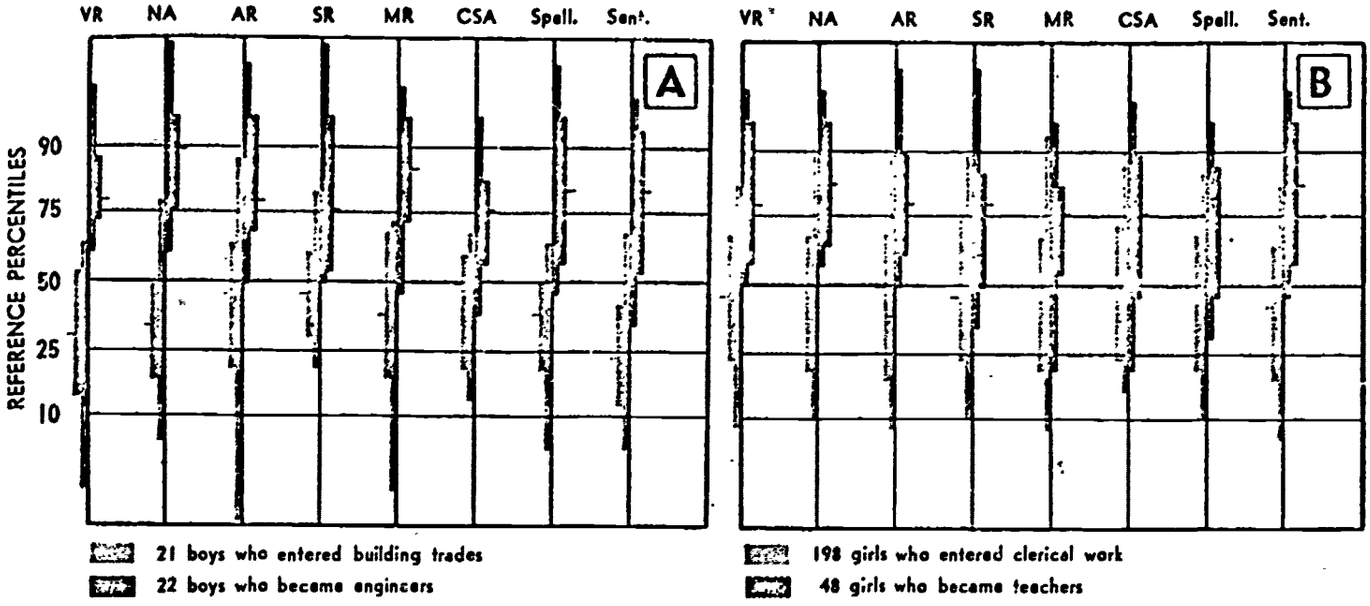


The vertical bars in the above figures are used to show the spread of scores in the contrasted groups. The wider portion of the bar includes the middle fifty per cent (25th to 75th percentiles) of the group; the upper thin bar represents those between the 75th and 90th percentiles and the lower thin bar shows those between the 25th and 10th percentiles. The short horizontal line intersecting the wider portion of the bar marks the median or 50th percentile.

to investigate overlap among contrasting groups — groups differing in subsequent education or in level of later occupation. Figure 1 provides a graphic comparison of selected educational groups. Figure 2 deals with occupational groups.

In summary, the results of the second follow-up study reinforce the conclusions of the earlier report. The *Differential Aptitude Tests* reveal important profile differences among high school students who enter diverse occupational and educational careers. Further, those abilities which counselors would expect to be distinctive in particular groups are actually found to be outstanding. It is apparent that the characteristics of high school students, measured by the *Differential Aptitude Tests,* bear important relations to their subsequent careers, as reported almost eight years later. These findings lend support to current counseling practices in general and provide some specific suggestions for improved test interpretation. — G. K. B.

FIGURE 2. ***Differential Aptitude Test*** **Scores and Subsequent Occupation**



COMPARISONS OF SCORES OF HIGH SCHOOL STUDENTS WHO ENTERED DIFFERENT FIELDS OF WORK. Chart A contrasts engineers with men employed in the building trades. The superiority of the engineers is most marked in Numerical Ability, Sentences, Mechanical Reasoning, and Spelling. Building tradesmen are close to the average of their high school classmates in Abstract Reasoning, Space Relations, and Clerical Speed and Accuracy. The small numbers of cases as well as the diversity within each group suggests that interpretation be tentative. In Chart B, the comparison is between teachers and clerks. The teachers are superior on all tests, most markedly so in Verbal Reasoning, Numerical Ability, Abstract Reasoning, and Sentences. The clerks are very close to the average of all high school girls.