

A STUDY OF CERTAIN HIGH SCHOOL GRADUATES IN RELATION
TO THEIR ELEMENTARY SCHOOL ORIGINS

by

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G. G. R. Jr.

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Chapter I

INTRODUCTION

General Description of the Area Included in the Study

The Blacksburg Magisterial District of Montgomery County, Virginia, was used as the basis for this study. At the time of this writing, that district covered 92,000 acres and comprised approximately one third of the area of Montgomery County.

The area under consideration was settled 208 years prior to the instigation of this study, in 1744, by pioneers who were deemed to be excellent judges of soil and location. Such notables as General George Rogers Clark and Daniel Boone visited this area. The town of Blacksburg, Virginia, the principal community in the district, was incorporated in 1798 by the General Assembly of the Commonwealth of Virginia, and named for William Black, who gave the land on which the town presently stands. In 1854 the Olin and Preston Institute was established at Blacksburg and, with that institution as a base, the Virginia Agricultural and Mechanical College was established in 1872 under provisions of the Morrill Act of the United States Congress. During the General Assembly session of 1895-1896, authorization was

given for the college to be known as "The Virginia Agricultural and Mechanical College and Polytechnic Institute." Later, in 1944, it was officially designated as "Virginia Polytechnic Institute."

Table 1, page 8, compares the population growth from 1872 until 1950 of the town of Blacksburg and the Blacksburg Magisterial District with the increase in student enrollment of the college. A study of this table reveals that the student enrollment of the college, the population of the town and the population of the district increased somewhat simultaneously.

Blacksburg, the largest town in Montgomery County at the time of this writing, had the distinction of being located on the divide between two large bodies of water, the Atlantic Ocean and the Gulf of Mexico. The area was drained to the eastward by the Roanoke River; to the westward by the New River. The average elevation was 2000 feet above sea level and the climate was relatively mild and humid. The average yearly temperature was 52 degrees Fahrenheit, and the average yearly precipitation 44 inches.

The town and its subdivisions constituted what might be termed a true college community, since they were built around the college, its Experiment Station, and its Extension Division. Only one small industry, the

Table 1. POPULATION GROWTHS OF THE TOWN AND MAGISTERIAL DISTRICT OF BLACKSBURG, VIRGINIA, COMPARED WITH THE INCREASE IN STUDENT ENROLLMENT OF THE VIRGINIA POLYTECHNIC INSTITUTE.

Year	Town Population	District Population*	College Enrollment
1872	**	**	132
1880	688	4,649	78
1890	**	3,769	150
1900	768	4,373	386
1910	875	4,989	471
1920	1,095	6,100	798
1930	1,406	6,844	1,495
1940	2,133	8,329	3,242
1950	3,352	13,404	3,801

* Includes the town population.

** Data unavailable.

Instrument Corporation of America, existed in the district. No main railroad was present. Only one main highway traversed the district. The Radford Ordnance Works was located at the edge of the area of this study; however, it provided only semi-permanent employment. The leading occupations of the district included farming and mining, but the college seemed to be the cornerstone of the community's economic life and a large factor in establishing the town's cultural patterns. Ninety-four per cent of the population was composed of white people. The district had a Roman Catholic church and Protestant churches representing 12 denominations. Organizations of the community were numerous, including over 100 in the town and 75 more in the district. The organization of organizations which strove to unify, systematize, and better plan community effort was the Community Federation.

The retail business establishments, as well as the hotel and banking facilities of the town, were dependent directly or indirectly on the college. An airport served the community, but this, too, was a part of the college. The background of traditions and the opportunities which were present in the district, as the seat of a sizable public institution, contributed in large measure to the cultural pattern of the community.

Description of the School Situation in the Blacksburg, Virginia, Magisterial District; Limitations of the Study

The schools of the Blacksburg Magisterial District included in this study were the Blacksburg High School and the ten elementary schools from which pupils were promoted to that school. Among those schools were a private school (4), located at Blacksburg, nine public schools designated as the Blacksburg (1), McCoy (2), Ellett (3), Luster's Gate (5), Long Shop (6), Price's Fork (7), Merrimac (8), Dry Run (9), and Norris Run (10), Schools. The accompanying map shows the locations of these elementary schools. Hereafter, unless specifically named, the elementary schools will be designated by the numbers in parentheses following the name of each, by groups, or by placement rankings, according to particular phases of this study which may be under consideration.

The information supplied in Table 2 concerns the location of the ten elementary schools in relation to the high school, the size of the teaching staffs of each elementary school, and the group into which each was placed for purposes of this study. The number of teachers given in the table indicates the size of each school staff in 1947. Some of the schools listed in

BLACKSBURG SCHOOL DIVISION

AN ADAPTATION FROM MAP OF
MONTGOMERY COUNTY PREPARED
BY THE DEPARTMENT OF HIGH-
WAYS, RICHMOND, VIRGINIA.

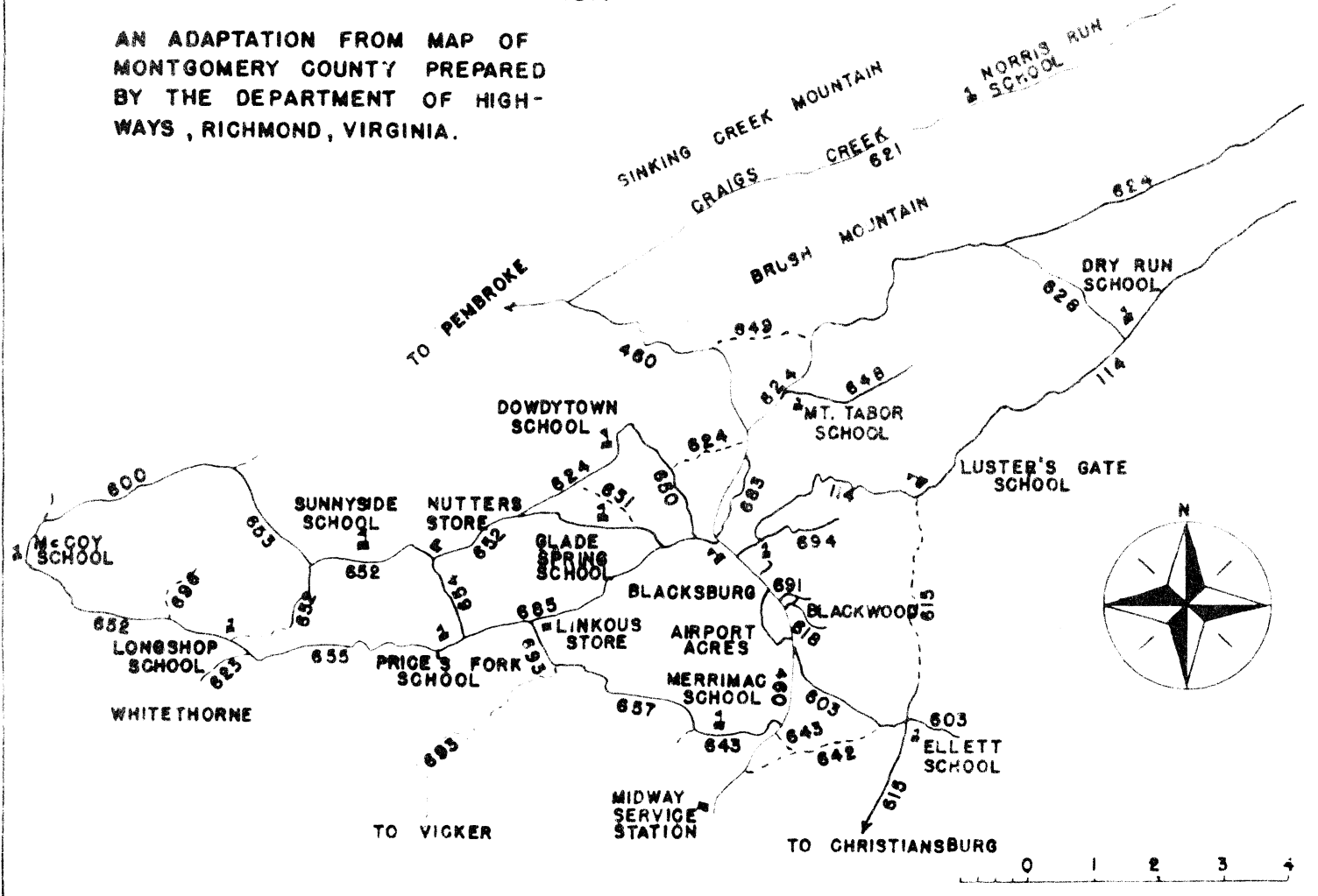


Table 2. DISTANCE OF EACH ELEMENTARY SCHOOL FROM
 BLACKSBURG HIGH SCHOOL, NUMBER OF TEACHERS
 ASSIGNED TO EACH, AND GROUPS INTO WHICH
 EACH SCHOOL WAS PLACED.

Elementary School Number	Miles From High School	Number of Teachers	Group Placement
1	0	22	1
2	13	2	4
3	5	4	3
4	$\frac{1}{2}$	1	2
5	4	2	3
6	9	3	4
7	6	7	3
8	3	2	3
9	12	1	4
10	15	1	4

Table 3. PHYSICAL PLANTS AND PROGRAMS OF TEN OF THE ELEMENTARY SCHOOLS OF THE BLACKSBURG MAGISTERIAL DISTRICT.

Elementary School	Central Heating Plant	Inside Toilets	Running Water	Janitorial Services	Hot Lunch Program	Library & Audio-Visual Equipment
1	Yes	Yes	Yes	Yes	Yes	Yes
2	No	No	No	No	No	Yes
3	No	No	No	No	No	Yes
4	Yes	Yes	Yes	Yes	No	Yes
5	No	No	No	No	No	Yes
6	No	No	No	No	No	Yes
7	No	No	No	No	Yes	Yes
8	No	No	No	No	No	Yes
9	No	No	No	No	No	Yes
10	No	No	No	No	No	Yes

Table 2 had been closed by the time this study had begun. The distances which separated the elementary schools from the high school ranged from zero to 15 miles, and the teaching staffs varied from one to 22 in number. The group classification given in the table, is explained later in this study.

Table 3 supplies the information concerning the physical plants and programs at each of the ten elementary schools in this study. The Blacksburg Elementary School and the private school were the only ones which had central heating systems, inside toilets, running water, and janitorial service. Only the Blacksburg Elementary and Price's Fork Schools had hot lunch programs and libraries. All schools had access to audio-visual equipment.

Table 4 indicates the relative holding power of the schools, that is, the percents of pupils retained from entrance until graduation from high school, which varied from nine to 100. This study was limited to the 86 pupils who were retained in school until their graduation from the Blacksburg High School.

Purposes of the Study

The purpose of this research was to discover what relations, if any, there were between elementary school

origins of the students and their ratings in high school. For convenience, the schools were distributed into four groups, as specified on page 19. Thus, the study proposed to compare the four groups as to the following items:

- | | |
|--|--|
| 1. Grade averages | 5. Co-curricular activities as indicated by office holding |
| 2. Parents' education | |
| 3. Intelligence quotients | 6. Ages |
| 4. Co-curricular activities as indicated by membership | 7. Absences |
| | 8. A. C. E. scores |

Furthermore, it proposed to compute coefficients of correlation between these respective eight items and the locations of the elementary schools as indicated by miles distant from Blacksburg.¹ It also proposed to compute certain partial coefficients of correlation, so that interpretations could be made concerning the significance of various items, deemed valuable to persons charged with school administration and supervision.

¹Hereafter, those distances will be referred to as school placement.

Table 4. DISTRIBUTION OF THE 1951 GRADUATES OF BLACKSBURG HIGH SCHOOL ACCORDING TO THE ELEMENTARY SCHOOL ATTENDED BEFORE ENTERING HIGH SCHOOL

Elementary School Attended	Number Entered High School	Number of High School Graduates	Per cent Retained Until Graduation
1	100	47	47
2	23	7	30
3	11	1	9
4	10	10	100
5	10	6	60
6	7	2	29
7	14	6	43
8	11	2	18
9	3	3	100
10	4	2	50
Total	193	86	44.5

Procedure of Study

The data for this study were obtained from the student's records on file in the offices of the principal and guidance director of the Blacksburg High School. The grade averages and intelligence quotients were taken directly from the pupils' permanent records. The same sources provided the data from which were calculated the pupils' ages, absences, and indexes for their parents' education. The indexes for the co-curricular activities were calculated from data in the Blacksburg High School annual for the 1950-1951 school year. The pupils' scores on the American Council on Education Test were taken from files in the office of the high school Guidance Director.

After the above-mentioned data were obtained, linear correlations¹ were computed between school placement and each of the eight items listed in the section of this chapter on purposes, except one. Other linear correlations were made between several of those items. Using the coefficients thus obtained, correlation coefficients of the first and second order² were computed.

¹H. E. Garrett, Statistics in Psychology and Education, pp. 268-303.

²Ibid., pp. 404-429.

Chapter II presents in an organized form the data resulting from these statistical operations. Chapter III gives interpretations of the data; Chapter IV, conclusions and recommendations.

Chapter II

ORGANIZATION AND PRESENTATION OF DATA

In the preceding chapter a brief presentation was given of the procedure followed in this study. The first portion of this chapter is devoted to a detailed explanation of the organization of the data.

In order to make the data of this study amenable to statistical treatment, it became necessary to reduce them, in every case, to numerical form. Thus, indexes were calculated, one from each pupil's record of his parents' education, found on his permanent record card. For each year of schooling reported by each of a given pupil's parents, a point was given. The total points thus received, in respect of an individual pupil's parents, was divided by the number of his living parents or guardians. This index was called the parents' education and is referred to hereafter in this study in that manner. Similarly, the pupils' co-curricular activities were divided into two categories, membership-years and officer-years. Indexes for the membership-years were calculated by giving one point for each year of a given pupil's membership in a single club; for officer-years, by giving one point for each year of office holding. The index for a pupil was the total number of points

obtained throughout his high school career for membership alone, or for membership and office holding, as the case might be. Ages were calculated from records of the dates of birth of the pupils, to the nearest birthday at the time of graduation. The average number of absences per year was calculated, first, by subtracting the total number of days present from the total number of days enrolled; then, by dividing the result by the number of years of attendance in high school. The A. C. E. scores were obtained from the students' files in the guidance office. These scores were the results of giving the pupils, when seniors in high school, a test entitled The American Council on Education Psychological Examination for College Freshmen. Pupils' grade averages and intelligence quotients were taken directly from the Blacksburg High School records.

For a portion of this study the pupils who had attended the ten elementary schools listed in Chapter I were distributed into four groups as follows: Group 1 consisted of the pupils who had attended Blacksburg Elementary School; Group 2 consisted of the pupils who had attended a private elementary school located in Blacksburg; Group 3 consisted of the pupils who had attended public elementary schools that were situated from three to seven miles, inclusive, from the high school; Group 4 consisted of the pupils who had attended public elementary

schools that were from eight to 15 miles, inclusive, from the high school. By attended is meant that the pupil attended a given school, at least, while enrolled in the sixth and seventh grades at that school, prior to entering Blacksburg High School. The few high school graduates who had transferred from some other district, state, or country were assigned to groups indicative of the school situations from which they had come, whether located in a town, or at some distance from it.

The succeeding eight tables, five to 12, give distributions of the data relative to the seven of the eight items heretofore mentioned. In this connection, it should be noted that these items, for convenience, are designated hereafter as factors.

Table 5. DISTRIBUTION OF MEMBERS OF THE CLASS OF 1950-1951 OF BLACKSBURG HIGH SCHOOL BY PER CENTS AND FREQUENCIES ACCORDING TO ACADEMIC AVERAGES; ALSO, BY GROUP FREQUENCIES AND AVERAGE GRADES OF GROUPS.

Academic Averages	Per Cents of Group				Per Cents of Total	Frequencies
	1	2	3	4		
A	23.4	80.0	13.3	0.0	24.4	21
B	29.8	20.0	26.7	50.0	31.4	27
C	29.8	0.0	26.7	35.7	26.7	23
D	8.5	0.0	33.3	14.3	21.8	11
E	8.5	0.0	0.0	0.0	4.7	4
Group Frequencies	47	10	15	14		86
Grade Average	87.63	95.42	85.93	86.31		88.02

Table 6. DISTRIBUTION OF MEMBERS OF THE CLASS OF 1950-1951 OF BLACKSBURG HIGH SCHOOL BY PER CENTS AND ACCORDING TO INDEXES OF PARENTS' EDUCATION; ALSO, BY GROUP FREQUENCIES AND GROUP MEANS OF INDEXES.

Parents' Education	Per Cents of Group				Per Cent of Total	Number of Pupils
	1	2	3	4		
16 - above	6.4	30.0	0.0	0.0	7.0	6
12 - 15	27.7	60.0	0.0	0.0	22.1	19
8 - 11	31.9	10.0	40.0	50.0	33.7	29
0 - 7	34.0	0.0	60.0	50.0	37.2	32
Group Frequencies	47	10	15	14		86
Mean	10.2	14.5	7.4	7.8		9.8

Table 7. DISTRIBUTION OF MEMBERS OF THE CLASS OF 1950-1951 OF BLACKSBURG HIGH SCHOOL BY FREQUENCIES ACCORDING TO INTELLIGENCE QUOTIENTS; ALSO BY GROUP FREQUENCIES AND GROUP MEANS

I. Q.	Groups				Total Pupils
	1	2	3	4	
131 - 140	1	2	0	0	3
121 - 130	2	1	0	0	3
111 - 120	5	3	0	0	8
101 - 110	14	3	2	3	22
91 - 100	11	1	5	6	23
81 - 90	8	0	5	4	17
71 - 80	6	0	3	1	10
Group Frequencies	47	10	15	14	86
Arithmetic Mean	98.5	115.5	89.5	93.4	98.1

Table 8. DISTRIBUTION OF MEMBERS OF THE CLASS OF 1950-1951 OF BLACKSBURG HIGH SCHOOL BY PER CENTS ACCORDING TO INTELLIGENCE QUOTIENTS; COMPARED WITH THE NATIONAL NORM.*

I. Q.	Per Cents of Group				Per Cent of Total	Per Cent of United States Population
	1	2	3	4		
Above 110	17.0	60.0	0.0	0.0	17.4	20.0
90-110	53.2	40.0	46.7	64.3	53.5	60.0
Below 90	29.8	0.0	53.3	35.7	29.1	20.0

* Sorenson, Herbert, Psychology in Education, New York, McGraw Hill Company, 1940, p. 146.

Table 9. DISTRIBUTION OF MEMBERS OF THE CLASS OF 1950-1951 OF BLACKSBURG HIGH SCHOOL BY FREQUENCIES ACCORDING TO CO-CURRICULAR ACTIVITIES; ALSO GROUP FREQUENCIES, ARITHMETIC MEANS OF MEMBERSHIP-YEARS AND OFFICER-YEARS.

Membership- years	Groups				Total Pupils
	1	2	3	4	
25 - 29	0	2	0	0	2
20 - 24	4	0	0	0	4
15 - 19	10	4	1	0	15
10 - 14	6	2	1	1	10
5 - 9	16	2	7	2	27
0 - 4	11	0	6	11	28
Group Frequencies	47	10	15	14	86
Means of Membership- years	9.9	16.0	6.0	3.4	10.0
Means of Officer- years	1.4	3.5	.6	.6	1.3

Table 10. DISTRIBUTION OF MEMBERS OF THE CLASS OF 1950-1951 OF BLACKSBURG HIGH SCHOOL BY FREQUENCIES ACCORDING TO AGES AT GRADUATION; ALSO BY GROUP FREQUENCIES AND GROUP MEANS.

Age Upon Graduation	Groups				Total Pupils
	1	2	3	4	
23	1	0	0	0	1
22	0	0	0	0	0
21	3	0	0	0	3
20	3	0	3	0	6
19	2	0	3	2	7
18	14	1	1	2	18
17	19	9	4	7	39
16	5	0	4	3	12
Group Frequencies	47	10	15	14	86
Mean	17.9	17.1	17.8	17.2	17.7

Table 11. DISTRIBUTION OF MEMBERS OF THE CLASS OF 1950-1951 OF BLACKSBURG HIGH SCHOOL BY FREQUENCIES ACCORDING TO AVERAGE NUMBER OF DAYS ABSENT PER YEAR; ALSO BY GROUP FREQUENCIES AND GROUP MEANS.

Average Days Absent Per Year	Groups				Total Pupils
	1	2	3	4	
30 - 34	1	0	1	0	2
25 - 29	1	1	1	0	3
20 - 24	2	1	0	0	3
15 - 19	5	0	1	0	6
10 - 14	3	3	2	2	10
5 - 9	14	1	8	4	27
0 - 4	21	4	2	8	35
Group Frequencies	47	10	15	14	86
Mean	7.7	10.0	10.7	4.9	8.0

Table 12. DISTRIBUTION OF MEMBERS OF THE CLASS OF 1950-1951 OF BLACKSBURG HIGH SCHOOL BY FREQUENCIES ACCORDING TO A. C. E. SCORES; ALSO BY GROUP FREQUENCIES AND GROUP MEANS.

A. C. E. scores	Groups				Total Pupils
	1	2	3	4	
153 - 173	1	2	0	0	3
132 - 152	2	0	0	0	2
111 - 131	4	3	0	0	7
90 - 110	10	3	2	0	15
69 - 89	11	2	5	4	22
48 - 68	10	0	2	8	20
27 - 47	9	0	6	2	17
Group Frequencies	47	10	15	14	86
Mean	80	116	61	60	77

Table 13. ARITHMETIC MEANS OF EIGHT FACTORS PERTINENT TO THE BLACKSBURG HIGH SCHOOL CLASS OF 1950-1951, ACCORDING TO GROUPS; ALSO, GROUP FREQUENCIES AND MEAN DISTANCE TRAVELLED PER PUPIL

Pertinent Data	Groups				Mean for total class
	1	2	3	4	
Academic Average	87.63	95.42	85.93	86.31	88.02
Parents' Education	10.2	14.5	7.4	7.8	9.8
I. Q.	98.5	115.5	89.5	93.4	98.1
Co-curricular Membership-years	9.9	16.0	6.0	3.4	10.0
Co-curricular Officer-years	1.4	3.5	.6	.6	1.3
Age at Graduation	17.9	17.1	17.8	17.2	17.7
Absence Per Year	7.7	10.0	10.0	4.9	8.0
A. C. E.	80.	116.	61.	60.	77.
Mean Distance Travelled Per Pupil	2.0	1.1	5.2	12.4	3.5

In a sense, Table 13, is a summary of Tables 5 to 12, inclusive. In addition to the arithmetic means from the preceding eight tables, this table shows the average distance travelled per pupil within each of the four groups. All of the results shown in Table 13 were computed from original data.

After the data had been organized and studied in terms of the four groups previously designated according to distances from Blacksburg, they were reorganized in terms of the ten elementary schools, as single schools from which the pupils studied had been promoted to high school. It was felt, at this point, that the original plan of treating the data in terms of four groups had served one purpose, that of bringing into focus whatever differences might be attributable to distance. However, it was deemed appropriate, as a more intensive approach to the investigation, to organize the data further, as has just been stated, in terms of individual schools. Thus, the elementary schools were ranked according to the distance of each from the high school. The Blacksburg Elementary School ranked one because it was nearest to the high school. The private school ranked two because it was the next in proximity. Each remaining elementary school was ranked in similar order. Correlations were made

between the school placements and each of seven of the eight factors previously listed. The results are shown in Table 14, herewith. The correlation coefficients shown in this table are of the zero order. Correlation coefficients of the first and second order were computed in the course of this investigation; but, to compute them, certain coefficients of the zero order other than those shown in Table 14 appeared to be needed. Such correlation coefficients and a few others of the zero order, which presented issues deemed relevant but not necessary to this study, are shown in Table 15.

In Table 16 the subscripts used in connection with the symbol, r , have reference to the following: school placement, 1, academic averages, 2, intelligence quotients, 3, and co-curricular membership-years, 4. Thus $r_{12.3}$ is the statistical denotation for the coefficient of correlation between factor 1 and factor 2 when factor 3 is held constant. In other words, the primary subscripts to the left of the point are the factors being correlated; the secondary subscripts to the right, the factors being ruled out or held constant. The three correlations, given in Table 16, which exclude school placement as a factor, were computed because they were needed in order to compute the correlation coefficients of the second order, which appear last in Table 16.

Table 14. RESULTS OF COMPUTATIONS¹ RELATIVE TO SCHOOL PLACEMENTS AND SEVEN² OF THE EIGHT FACTORS CONSIDERED BASIC TO THIS STUDY.

Factors	\underline{r} Between School Placement and Factor	Standard Deviation ³ of \underline{r}	Level of Confidence ³ of \underline{r}
Academic Averages	-.199	.103	Not significant
Parents' Education	-.298	.098	.01
I. Q. 's	-.214	.103	.05
Co-curricular Membership-years	-.415	.172	.01
Co-curricular Officer-years	-.252	.101	.05
Absences	+ .080	.107	Not significant
A. C. E. Scores	-.315	.097	.01

¹ The statistical symbol used for coefficient of correlation is \underline{r} .

² The age factor was not computed due to the uniformity of age means, as shown in Table 13.

³ The procedure used in deriving these results were adopted from H. E. Garrett, Statistics in Psychology and Education, pp. 58-64, 71, 187-188, 194-196.

Table 15. RESULTS OF COMPUTATIONS RELATIVE TO CORRELATIONS BETWEEN CERTAIN FACTORS.

Factors Correlated	<u>r</u>	Standard Deviation of <u>r</u>	Level of Confidence of <u>r</u>
Academic Averages and A. C. E. Scores	+.503	.810	.01
Parents' Education and Academic Averages	+.595	.069	.01
I. Q. 's and Academic Averages	+.677	.058	.01
Parents' Education and A. C. E. Scores	+.698	.055	.01
I. Q. 's and A. C. E. Scores	+.768	.044	.01
Co-curricular Membership-years and I. Q. 's	+.397	.098	.01
Co-curricular Membership-years and Academic Averages	+.373	.094	.01

Table 16. RESULTS OF COMPUTATIONS OF PARTIAL CORRELATIONS
AMONG PERTINENT DATA.

Partial Correlations	Partial r	Level of Confidence
$r_{12.3}$	+ .075	Not significant
$r_{13.2}$	+ .089	Not significant
$r_{23.1}$	+ .664	.01
$r_{14.3}$	+ .368	.01
$r_{24.3}$	+ .139	Not significant
$r_{14.2}$	- .376	.01
$r_{43.2}$	+ .220	.05
$r_{12.34}$	+ .137	Not significant
$r_{14.23}$	- .408	.01

All eight factors were not used in the partial correlations of the first and second order. In an effort to avoid what Garrett¹ terms spurious correlation, the A. C. E. factor and the parents' education factor were eliminated from further considerations. The specific consideration leading to this elimination were as follows: Parents' education had been found to be related to academic average to a highly significant degree. However, intelligence had been found related to academic average in the same manner, but to an even higher degree. Therefore, it was deemed preferable to study only the two factors, intelligence and academic average; and to set aside parents' education. Similarly, A. C. E. scores were found to be significantly correlated with academic averages, parents' education and I. Q.'s, but more highly correlated in respect of I. Q.'s than of the other two factors. Hence, further study of A. C. E. scores was regarded as unlikely to yield results that could not better be obtained from working with I. Q.'s.

¹H. E. Garrett, Statistics in Psychology and Education, (1950), pp. 429-432.

The co-curricular officer-years factor was also eliminated because it seemed that the membership-years index was a truer indication of co-curricular participation than the former. Furthermore, the uniformity of means of ages upon graduation caused that factor to be omitted. Finally, the attendance factor was eliminated from these computations because it was deemed insignificant. That factor, as reference to Table 14 will show, gave evidence of but little ($+0.080$) relationship to school placement.

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In this chapter, the data have been presented in the form of tables which give the results of certain statistical manipulations. The succeeding chapter gives interpretations of these data which in turn will lead to the conclusions of the study, presented in Chapter IV.

Chapter III
INTERPRETATIONS OF THE DATA

In previous sections, an account has been given of the manner in which the data of this study were organized. The preceding chapter presents the data, mainly in the form of tables. It also reports the results of treating the data statistically by giving certain coefficients of correlation, together with the standard errors of those statistics by which to make judgements of their significance. This section is to interpret the data by making use of the facts set forth in Chapter II. The first part hereof is devoted to interpreting data with respect to groups; the second part, with respect to the correlations obtained, using placement of individual schools as a factor.

Interpretations of the Data with Respect to Groups

The distances of the elementary schools from the high school varied from zero to 15 miles. From this finding it was inferred that certain students had been required to travel from their homes to high school for much longer periods of time than others. Obviously, the time spent might have been used for studying or doing the chores at home. Because the number of teachers in the elementary

schools varied from one to 22, it seemed evident that some children had had fewer instructors than others; that the pupils who had attended the smaller schools were less apt to have had wide ranges of experience with school personnel than pupils who had attended the larger schools. If it be assumed that to have more time for study and to be taught by larger numbers of teachers are advantages, it follows that certain children were more priveleged than others.

Only two of the elementary schools studied had central heating plants. The others were heated by individual coal stoves in each classroom. Two of the schools were equipped with inside toilets; the other eight with outside toilets, at some distance from the school building. In two of the schools, running water was available. The other schools had to obtain water from sources outside the building, place it in an accessible container, and dispense it through a common drinking device. Janitorial service was available in but two of the schools. The others were served in that capacity by the teacher or teachers in charge, aided at times by the pupils.

Hot lunches were available in two of the schools. The children attending the other schools had either to bring cold food to school for their mid-day meals, or else do without. All the schools had access to audio-visual equipment

but the smaller rural schools were obliged to obtain such equipment from a center within the district. Again, an assumption may be made regarding the advantages which had accrued to some pupils and not to others, namely that their elementary experiences had been more fortunate in respect of physical facilities.

No set pattern existed among the schools with regard to the per cent of pupils retained until graduation; these per cents varied from nine to 100, when comparisons were made among groups.

The grade averages varied considerably when computed for pupils in each of the four groups. When the pupils of Group 2 had completed high school they had high averages, none of which was below "B". The pupils of Group 1 had averages 83 per cent of which were no lower than "C". None of the pupils of Group 4 had "A" averages. However, no set pattern appeared to exist among the groups regarding grade averages, when studied in relation to distances from high school. In other words, there was an absence of what might be called a straight-line relationship between grade averages and distance.

Groups 3 and 4 were noticeably low with respect to parents' education. These two groups included no parents whose education had extended beyond high school. Group 2 was high in this regard. At least 90 per cent of this

group had parents who had had college education.

The pupils of Group 2 tended to have higher intelligence quotients than did the members of any other group; the pupils of Groups 3 and 4 tended to have lower. It should be noted that Group 2 was above the national norm in this respect, whereas Groups 3 and 4 were considerably below.

Groups 1 and 2 had higher indexes of co-curricular membership-years than did Groups 3 and 4. The average of indexes for Group 4 were approximately half that for Group 3. Thus, it was assumed that distance from the high school might have been a factor in determining co-curricular participation.

The ages at graduation from high school ranged from 16 through 23. Group 2 had a high concentration on one age, from which the averages for each of the other three groups varied but little.

The pupils of Groups 2 and 3 had the poorest records of attendance; the pupils of Group 4 had the best.

Groups 3 and 4 had the lowest averages of A. C. E. scores; Group 2 had the best average of any of the four groups.

Interpretations of the Data with Respect to the Correlations
Made Using Placement of Individual Schools as a Factor

When the data were treated in terms of individual schools, no correlations were made between the age factor and any other factor, due to the uniformity of ages which existed among the groups. However, it was deemed relevant to this study to compute correlations between school placement (or geographical location) and academic averages, parents' education, intelligence, co-curricular membership, attendance, and A. C. E. scores.

The correlation between academic averages and school placement was found to be other than significant, which was taken to mean that no relationship existed between those two factors. The correlation with parents' education was probably¹ significant, which seemed to indicate that the better-educated parents lived closer to the more populous area. Between intelligence quotients and school placement the relation appeared to have possible significance. Conceivably, there was a trend for more intelligent students to live nearer to the high school. The correlation between

¹When correlations were found to be significant to the .05 level they were considered as possible; when at the .01, as probable.

co-curricular membership-years and school placement was probably significant. This showed that co-curricular memberships existed predominately among students located nearer to the high school. There appeared to be some possible significance between co-curricular office-holding and school placement. No significant correlation was found between attendance and school placement. This suggested the probability that attendance did not vary consistently with distance from school. The correlation between A. C. E. scores and the school placement was probably significant.

Because it was recognized that computations involving only two factors do not sufficiently take into account other factors which may have bearing on the relationships under consideration, it was deemed necessary to make certain partial correlations of the first and second order. Such correlations probably give truer indications of relationship than do those of zero order, due to their very nature, that of holding certain factors constant while considering that others vary. Thus, the correlation between school placement and academic averages, when the I. Q. factor had been partialled out, was found to be insufficient for significance; likewise, the correlation between school placement and I. Q., with the academic average partialled out.

Also, the correlation between school placement and academic average, with I. Q. and co-curricular factors

held constant simultaneously, was not significant. Thus, the correlation between the academic average factor and the intelligence factor, previously found to be significant, was substantiated by further computations. In those computations it was assumed, for the moment, that no significant relationship existed between the academic and intelligence factors. The results thus obtained were of such low significance as to cause the investigation to return, perforce, to the earlier finding; to conclude that the academic average had been affected more by intelligence than by distance from school.

The correlation between school placement and co-curricular membership-years, with the intelligence factor held constant, was found to be significant; as was also the correlation between school placement and co-curricular membership-years, with the academic average factor held constant. The correlation between school placement and co-curricular membership-years, with both academic average and intelligence factors held constant was significant. These findings were accepted as substantiating the interpretation that co-curricular membership was related to distance from school.

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From the interpretations presented in this chapter, certain conclusions and recommendations seem to follow. They are given in the final chapter.

Chapter IV

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are made on the basis of this study:

Conclusions

1. No set pattern existed among the elementary schools regarding the per cent of pupils retained until graduation from high school.
2. There seemed to be no probability that a relationship existed between the academic averages and the distances of the elementary schools from the high school, which tended to contradict a conclusion in the study by Ruth Little.¹
3. There was no appreciable age variance among the groups.
4. There was probable relationship between the education of parents and school placement, indicating a trend on the part of better-educated parents to live in close proximity to the high school.
5. There was little or no probability of relationship between school placement and intelligence.

¹ Little, Ruth Chambers, A Study of the Effect of Community Upon the School Adjustment of Sixth and Seventh Grade Pupils, p. 31.

6. No set pattern existed pertaining to attendance, since the group which travelled the greatest distance had the best record of attendance. This, too, tends to be contrary to a conclusion in the study by Little.¹
7. Distance was a factor in co-curricular activities; the students who lived closer to the school evidently had the advantage in this respect.
8. Students living closer to the school tended to have higher A. C. E. scores. In summary, it is pointed out that two salient findings, relative to the population under investigation, emerged from this study:
 - (a) Academic success in high school tended to be determined by native ability rather than by distance travelled on the way to school;
 - (b) Participation in co-curricular activities tended to be strongly and adversely affected by such travel.

¹ Little, Ruth Chambers, A Study of the Effect of Community Upon the School Adjustment of Sixth and Seventh Grade Pupils, p. 32.

Recommendations

1. Emphasis should be placed on making arrangements of the school day such that the co-curricular activities of students who live further from school may be enriched.
2. The physical plants of the smaller, rural, elementary schools should be improved, perhaps by consolidation.
3. More research should be undertaken, along the lines of this study, based on populations other than those of a college, non-industrial community.

BIBLIOGRAPHY

Fetter, Joseph Austin, A Study of the Co-curricular Program in the Blacksburg, Virginia, High School, unpublished master's thesis, Virginia Polytechnic Institute, 1951.

Garnett, William Edward, A Social Study of the Blacksburg Community, Virginia Polytechnic Institute, Agricultural Experiment Station, Blacksburg, Virginia, 1935.

Garrett, H. E., Statistics in Psychology and Education, Longmans, Green and Company, 1950.

Lindquist, E. F., Statistical Analysis in Educational Research, Houghton Mifflin Company, 1940.

Little, Ruth Chambers, A Study of the Effect of Community Upon the School Adjustment of Sixth and Seventh Grade Pupils, unpublished master's thesis, Virginia Polytechnic Institute, 1949.

Sorenson, Herbert, Psychology in Education, McGraw Hill Company, 1940, p. 146.

Thompson, Mireille Kester, Attitude Toward Parents and Teachers and General Adjustment of High School Seniors in Relation to School Progress and Acceptance Among Associates, unpublished master's thesis, Virginia Polytechnic Institute, 1951.

Virginia Polytechnic Institute Catalog, Virginia Polytechnic Institute Printing Office, Blacksburg, Virginia, 1952, p. 265.

Seventeenth Census of the United States, United States Government Printing Office, 1950.

Vertical files found in the Virginia Polytechnic Institute Library, Blacksburg, Virginia:

History of Montgomery County, by Kitty Trigg (Evans) Barnitz.

Early Blacksburg History, from the Blacksburg News of 1881, v. 1, No. 1, July 29, 1881.

Vertical files found in the Virginia Polytechnic Institute Library, Blacksburg, Virginia: (continued)

History of Montgomery County, R. A. Brock

History of Blacksburg, Virginia, Important Dates,
Ralph M. Brown, compiler, 1942.

Blacksburg Weather, 1893-1939, Ralph M. Brown.

Early Blacksburg History, T. N. Conrad.

Facts About the Blacksburg Community, compiled by
Leland B. Tate.

Blacksburg Is Booming; Has Citizenry 1,110, from The Virginia Tech, Vol. 22, No. 3 (October 16, 1924) p. 3.

Blacksburg, Virginia, History, from the Southwest Corner, by Goodridge Wilson.

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