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A COMPARISON OF MEASURES OF ABILITY AND ACHIEVEMENT  
IN THE CHINOOK HIGH SCHOOL

by

LEONARD H. WHITNEY

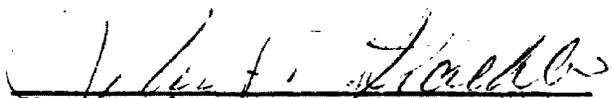
B. A., Minot State Teachers College  
Minot, North Dakota, 1941

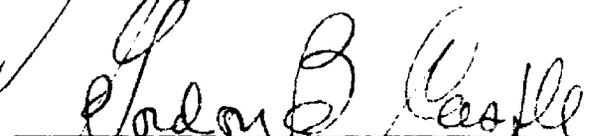
Presented in partial fulfillment  
of the requirements for the degree of  
Master of Education

MONTANA STATE UNIVERSITY

1954

Approved by:

  
Chairman, Board of Examiners

  
Dean, Graduate School

  
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Leonard H. Whitney

August 19, 1954

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## CHAPTER I

### THE PROBLEM AND ITS SETTING

Introduction. A good school administrator does not assume that because his relationship with members of his staff and the local board of education is harmonious that he has no problems. Instead, he is ever watchful for signs which may indicate a need for action by his teachers or himself which will result in greater educational opportunity for his pupils.

Every school administrator should be concerned with the mental growth and development of the young people who attend his school. He should want to know how well his school provides for their academic needs.

W. W. Clark, writing in a recent issue of a leading educators' periodical said:

It is a common and desirable practice for counselors and teachers to consider the achievement of individuals in relation to their mental ability, frequently expressed as intelligence grade placement, mental age grade placement, expectancy, or their percentile or standard deviation rank in mental ability as related to their rank in achievement.<sup>1</sup>

Since a comparison of measures of ability with achievement had never been made at Chinook, the writer secured permission from the superintendent to make such a study.

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<sup>1</sup>W. W. Clark, "Evaluating School Achievement in Basic Skills in Relation to Mental Ability," Journal of Educational Research, 46:179-191, November, 1952.

## I. THE PROBLEM

Statement of the problem. The purpose of the study was to compare pupil ability and achievement, to establish the extent of under-achievement and over-achievement, and to identify for school administrators and teachers those individuals whose achievement scores were considerably above or below the levels of their ability scores. Selected cases were presented to show how certain data could be related to underachievement and overachievement.

Assumptions and limitations of the problem. It was assumed, for the purpose of this study, that:

1. Intelligence tests measure ability to learn.
2. Achievement tests measure what has been learned.
3. The normal ages for high school pupils as used in this study were freshmen- age 14; sophomores- 15; juniors- 16; seniors- 17.
4. Pupils whose achievement scores were one or more quintiles above that of their ability were considered "overachieving", and pupils whose achievement scores were one or more quintiles below that of their ability were considered "under-achieving."

This paper describes conditions in the high school district at Chinook, Montana. It treats only those factors which were related to pupil ability and achievement in the high school.

Importance of the problem. Teachers and administra-

tors are interested in learning the degree of over-achievement and under-achievement which exists among pupils in their school. They want to know how much a pupil has learned as compared to his ability to learn. This paper provides information concerning the extent of over-achievement, under-achievement, and the normal status of members of the sophomore, junior, and senior classes in the high school.

It identifies those pupils who may be expected to develop into problem cases. The data in this paper may be used as a basis of comparison by the counselor and teachers in studying individual cases. It will furnish the administrator and teachers with the correlation which exists between achievement and mental ability of pupils in the high school. It will indicate to some degree the success of the school in its attempt to educate pupils along academic lines.

Sources of data. The historical data were gathered through personal interviews and correspondence with pioneer teachers, early settlers, and from the records found in the school, courthouse, and local newspaper files.

The correlation of pupil achievement with ability to learn resulted from scores taken from the Otis Self-administering Test of Mental Ability (Higher examination) and the Iowa Tests of Educational Development.

Information necessary for preparing quintile classification of pupils was obtained from Germane and Germane, Personnel Work in High School.<sup>2</sup>

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<sup>2</sup>Charles E., and Edith G. Germane, Personnel Work in the High School (New York: Silver Burdett Company, 1941), pp. 97-114

Other miscellaneous information was taken from the record of attendance and the permanent school records.

Treatment of data. Data cards for each of the 197 pupils examined in the study were arranged for each class in descending order based on the results obtained from the Otis Self-Administering Test of Mental Ability. Each pupil's achievement score was then noted and his rank determined. The difference in rank between the ability to learn as measured by the Otis test, and the achievement of each individual as measured by the Iowa Tests, was found and this difference squared. The sum of the difference squared was then substituted in Spearman's Formula for computing average correlation by the rank-difference method.

A quintile classification was made for each class studied to show which pupils belonged in the upper 20 per cent of the class in ability and achievement and which pupils belonged in the other quintiles.

The data cards were separated into three stacks; one composed of sophomore cards, one composed of junior cards, and one composed of senior cards. The cards for each class were arranged in descending order based on the results obtained from the Otis Self-Administering Test of Mental Ability. They were then separated in this order into five groups with approximately the same number of cards in each group. The names were listed in a column on the left-hand margin of a sheet of paper under the heading- "Rank on Otis Self-Administering Test of Mental Ability."

Another similar arrangement was made of the cards in each class ranked on the basis of achievement. These names were listed in rank order on the right-hand margin of the sheet mentioned above under the heading- "Rank on the Iowa Tests of Educational Development." A line was drawn connecting each pupil's name in the left-hand column with his name in the right-hand column. Oblique lines on the ranking indicated pupils whose tested ability to learn differed from their achievement. This information was transferred to quintile charts for greater ease of interpretation and evaluation.

## II. SETTING OF THE PROBLEM

Origin of the town of Chinook. Little has been written about that section of Montana lying north of the Bear Paw Mountains in the Valley of the Milk River. It was in this valley, less than a mile north of the junction of Red Rock Creek with the Milk River that the town of Chinook was located.

Before the railroad was built through the valley, the only store in the area was one operated at Old Fort Belknap by Tom O'Hanlon. O'Hanlon was acting as post trader at the fort when Major W. L. Lincoln arrived in the year 1878 to assume his duties as agent-in-charge of the Fort Belknap Indian Reservation.<sup>3</sup>

The Great Northern Railway was built through northern

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<sup>3</sup>Al J. Noyes, In The Land of Chinook(Helena, Montana: State Publishing Company, 1917), p. 27.

Montana in the year 1888. It passed two miles north of Old Fort Belknap and on the opposite side of the river. It was apparent to O'Hanlon and his assistant, I.V. Bogy, that a town would be necessary to supply the agency, and they agreed that a low hill near the tracks would be a good location for the town. Accordingly, Bogy built a cabin on the land in order to have first rights when the reservation was thrown open for settlement. The land was turned over to a press association which was financed by several farm papers in the East, but the Federal Government would not give title to the land. Instead, the Government reserved it for a townsite and money from the sale of the lots went into the school district funds. D. R. McGinnis, one of the newspapermen, named the new town Chinook.<sup>4</sup>

James J. Hill's glowing account of the opportunities awaiting the settler who might homestead on the land in Montana induced many adventurous individuals to leave their homes in the Central Plains and go West. Typical of such accounts is the following:

Chinook is surrounded by a vast tract of wonderfully fertile land where thousands of free homesteads await the coming of the settler. Tributary to it are the benchlands of the Bear's Paw Mountains, one of the most extensive and productive stock ranges in the West. Timber suitable for fuel and building purposes is found in abundance in these mountains. Large fields of lignite coal of the finest quality are mined within four miles of town.<sup>5</sup>

No town in the West offers better inducements to the

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<sup>4</sup>Al J. Noyes, In The Land of Chinook, p. 27.

<sup>5</sup>Ibid, p. 140.

settler or investor and all such are invited to come and see for themselves.<sup>6</sup>

Many people did come to see for themselves, and it was not long until the town could boast a population of 200 people. The Post Office was established in 1889.<sup>7</sup> The town was located in the eastern part of Chouteau County. This portion of the county was later cut off from the original and made into Blaine County with Chinook as the county seat.

Chinook was a rapidly growing trade center and eventually became an important shipping point for farm produce to the rich mining regions in western Montana, while livestock and wool shipped from Chinook found a ready market in eastern cities. Later, oil and natural gas were found south of town in considerable volume. Many business firms were established, and people within a radius of fifty miles made this their trading point.

Establishment of the Chinook High School. The Chinook High School was probably the first high school built in northern Montana. It was established in 1899 as a three-year high school. The first class composed of six pupils was graduated in 1902. Pioneer families living in Chester, Havre, Harlem, and Glasgow sent their children to high school in Chinook. When it was first established, the high school had the unique distinction of serving the youth of two nations. Children of Canadian families were admitted on an equal basis

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<sup>6</sup>The Chinook Opinion. May 22, 1890.

<sup>7</sup>Recollections, Thos. O'Hanlon, Sr., Chinook.

with American born youngsters. No pupils were expected to pay tuition.

In 1919, the high school offered a variety of courses. Those who wished could prepare for college entrance. A thoroughly practical course was offered in vocational agriculture for those interested in farming. Young people who expected to teach could secure normal training at Chinook. Graduates who took this course received "second grade" teaching certificates. The commercial course provided thorough instruction in all commercial branches fitting the graduate for positions in business offices at once.<sup>8</sup>

The Chinook High School has served the people of Chinook and Blaine County for more than half a century. Since 1902, when the first diploma was conferred upon the first pupil, more than 1,400 young people have graduated from the institution.

The high school district was enlarged until today it embraces an area of 1,715 square miles. This is an area greater than that of the state of Rhode Island.

A steady growth occurred in the high school enrollment during the last twenty-five years. In 1926, the total enrollment was 115. In 1951, it was 282. In 1926, the faculty was composed of ten teachers. In 1951, there were seventeen teachers on the staff. The graduating class in 1926 numbered 21. In 1951, fifty-seven young people received diplomas.

ok Breeze, High School Annual, (Chinook,

## CHAPTER II

### REVIEW OF RELATED STUDIES

Intelligence and electricity have many properties common to each other. Both are abstract in form, both are measures of power, both represent great potentialities which can be fully realized only when their power is developed and put to work, and both are difficult to define. Educators everywhere have been trying for years to find out more about this abstract something called intelligence. Volumes have been written and thousands of experiments and studies have been made to ascertain just what intelligence really is and how it can best be measured.

The writer was concerned with a comparison of measures of intelligence and achievement. Some of the literature reviewed is presented here as background material for this study.

#### I. STUDIES MADE IN MONTANA

James<sup>1</sup> investigated some of the factors which influence scores made by Air Force Officers' Training Corps students on the annual achievement examinations.

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<sup>1</sup>Newton E. James. "An Investigation of Factors Affecting the Scores Made on the Annual AF-ROTC Achievement Examinations", (unpublished Master's thesis, Montana State University, Missoula, 1951), 55 pp.

Schools were grouped into five categories according to their A. C. E. Psychological Examination score averages. Purpose was to hold constant, factor of mental ability when considering the effect of scheduling variations.

In order to examine the relationship between ability as measured by the A. C. E. Psychological Examination score, and the achievement as measured by the ConAC Examination the means of the achievement scores of each of the five categories were compared.

Among other things he found that an obvious positive relationship existed between success on the A. C. E. Psychological Examination and success on the ConAC Achievement Test.

Gold<sup>2</sup> compared the ability and achievement of Blackfeet Indian school children with white school children. Traits and characteristics of early Blackfeet as exhibited in early Indian schools were taken from a questionnaire and sent to successful businessmen who had lived among them over a period of years.

He found that one hundred per cent of the replies indicated that full blood Blackfeet Indian school children were not as intelligent as white school children. Ninety per cent of the replies agreed that mixed blood Blackfeet Indian school children were not as intelligent as white school children. Ninety-six per cent of the replies agreed that mixed

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<sup>2</sup>Douglas Gold, "The Intelligence and Achievement of Blackfeet Indians", (unpublished Master's thesis, Montana State University, Missoula, 1934), 74 pp.

blood Blackfeet Indian school children were more intelligent than full bloods.

From achievement tests he found that Indian pupils showed lower achievement than white pupils in spelling, arithmetic, and reading. They showed achievement approximately in negative correlation to the degree of Indian blood in spelling, arithmetic, and reading. They showed favorably in comparison with white school children in penmanship.

## II. STUDIES MADE IN OTHER STATES

In 1953, Alexander<sup>3</sup> made a study using 35 teachers in grades III - VIII in Lawrence County, Missouri to show the inadequacy of teacher judgment of pupil intelligence and achievement. The teachers had six months to become acquainted with their pupils. They were given three prepared forms - A, B, and C. On Form A, teachers were asked to list in order the 5 pupils who in their opinion were the most intelligent, and the 5 who were the least intelligent in their groups. On Form B, teachers were asked to list 5 pupils who were working most nearly up to capacity in each of the skill areas of reading, language, spelling, and arithmetic. On Form C, teachers were asked to list the 5 pupils in their respective groups who, in their opinion were achieving farthest below capacity in each skill area studied. Then, standard tests were administered. The California Test of Mental Maturity was used to measure intelligence, and the Stanford Achievement Test was used to

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Alexander, "Teacher Judgment of Pupil Intelligence Is Not Enough," Elementary School Journal, vol. 63, no. 1, p. 15, 1953.

measure intelligence, and the Stanford Achievement Test was used to evaluate reading, language, spelling, and arithmetic.

He found: Teachers may be expected to be correct in their judgment of pupils of highest and lowest intelligence in the groups slightly less than 60% of the time. Teachers may be expected to be correct in their selection of pupils who are achieving highest and lowest in the group in relation to mental capacity about one-fourth of the time. Even when teachers attempt to appraise subjectively the achievement of pupils in relation to mental capacity, they are likely to be influenced by rank of pupils in the group.

He concluded that: Major emphasis must be placed on a more effective type of teaching and learning situation rather than on "marking" as an incentive for achievement. In all records and reports concerned with an evaluation of pupil capacity and achievement teacher judgment must be adequately supported by objective data.

Johnson<sup>4</sup> gave 60 college students a 10 minute practice period every day for 20 days in mirror reading. During the course of the experiment several intelligence tests were given to the students. He obtained correlations between the average scores on all tests and performance in mirror reading of  $.34 \pm .08$  for the average number of words read each day, and  $.46 \pm .07$  with improvement in mirror reading over 20 days. He found

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<sup>4</sup>A. M. Johnson, "A Study of the Relation of the Ability to Learn and Intelligence as Measured by Tests," Journal of Educational Psychology, 14:540-544, December, 1923.

that students in the upper half on intelligence improved more in mirror reading than those in the lower half. He concluded that there was a fairly large positive correlation between the ability to become efficient at learning inverted print and intelligence as measured by the usual group tests.

Clark<sup>5</sup> evaluated school achievement in basic skills in relation to mental ability. It was his purpose to present a summarization of data which appeared in the manuals for the California Achievement Tests and the California Test of Mental Maturity various levels which made possible the adjustment of achievement norms to the mental ability of class or grade groups.

Clark made the following significant statement:

Numerous studies have shown the positive correlations of the achievement of individuals in the basic skills with mental ability. These correlations, when corrected for normal range, are ordinarily in the vicinity of .70 which is properly interpreted to mean that about 50 per cent ( $r^2 = .49$ ) of the variance, or common elements, is accounted for. It is a common and desirable practice for counselors and teachers to consider the achievement of individuals in relation to their mental ability, frequently expressed as intelligence grade placement, mental age grade placement, expectancy, or their percentile or standard deviation rank in mental ability as related to their rank in achievement.<sup>6</sup>

He developed tables from grades one through fourteen in reading, mathematics, and language which indicated the difference in achievement to be expected of groups with varying median intelligence quotients.

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<sup>5</sup>W. W. Clark, "Evaluating School Achievement in Basic Skills in Relation to Mental Ability," Journal of Educational Research, 46:179-191, November, 1952.

He concluded that the tables should facilitate a more adequate interpretation of standardized test data in the basic skills.

Green<sup>7</sup> gave 41 eleventh grade pupils the Otis Quick-scoring Test of Mental Ability and the Otis Gamma Test (Form AM). The latter was a learning test consisting of five parts namely: letter observation, digit symbol, vowel, consonant, parentheses marking, and reversed type. He obtained a correlation with its standard error between school marks and intelligence quotients of the group of  $.54 \pm .11$ . He indicated that the correlation might have been more reliable had the scores been computed for a much larger group of pupils.

He concluded that if the learning tests employed in the study measured the ability to learn with a fair degree of reliability--

1. The low correlation between sub-tests indicate that the tests were measuring different learning skills.
2. The low correlations indicate that there is little relationship between the ability to learn and intelligence as measured by intelligence tests.
3. The low correlations between school marks and the ability to learn indicate that

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<sup>7</sup>Clinton Wallace Green, "Relationship Between Intelligence as Determined by Intelligence Tests and the Ability to Learn as Determined by Performance or Learning Tests," Journal of Educational Research, 47:191-200, November, 1953.

factors other than the ability to learn operate to influence school marks.

Assum and Levy<sup>8</sup> compared academic ability and achievement of two groups of college students. They were interested in three problems:

1. How does a group of adjusted students compare with a group of maladjusted students in regard to scholastic aptitude?
2. How does a group of adjusted students compare with a group of maladjusted students in regard to scholastic achievement?
3. What is the correlation of scholastic aptitude and achievement within these two groups?

The investigation was made during the year October 1, 1945 to October 1, 1946. Two groups of college students with 71 in each group were used in this comparison. One group the "center group" was composed of students who had used the facilities of the Counseling Center at the University for help in solving problems. The other group, the "non-center group" had not been to the center for counseling.

The data gathered for each individual consisted of--  
Ratings of scholastic aptitude given to entering students:

1. A.C.E. quantitative (Q) score
2. A.C.E. linguistic (L) score

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<sup>8</sup>A. L. Assum, and S. J. Levy, "Comparative Study of the Academic Ability and Achievement of Two Groups of College Students," Journal of Educational Psychology, 38:307-310, May, 1947.

3. A.C.E. total (T) score
4. College reading ability score
5. College writing ability score

Ratings of scholastic achievement were based on the permanent grades a student received by taking the comprehensive examinations covering the work of a school year in a given course. A table with column headings of mean, standard deviation, standard error of mean, and critical ratio was set up to show results of the statistical comparison of both groups. They found that on the basis of the data used that:

1. The maladjusted group of students was comparable in academic ability to the adjusted group.
2. In academic achievement a difference was noted in favor of the adjusted group.
3. When the coefficient of correlation was calculated between the average comprehensive score and the A. C. E. (T) score for each student, an 'r' value of .40 for the "center group" and an 'r' value of .35 for the "non-center group" were found.

#### Summary

1. James found that a positive relationship existed between success on the A.C.E. Psychological Examination and success on the ConAC Achievement Test.

2. Gold found that full-blood Blackfeet Indian school children were not as intelligent as white school children.

3. Alexander discovered that teacher judgment of pupil intelligence and achievement was too subjective and often inaccurate.

4. Johnson found a large positive correlation between the ability to learn inverted print and intelligence as measured by the usual group tests.

5. Clark's study indicated that positive correlations of achievement of individuals in the basic skills with mental ability are ordinarily in the vicinity of .70.

6. Green found a correlation of  $.54 \pm .11$  between school marks and intelligence quotients in an experiment with eleventh grade pupils.

7. Assum and Levy found that maladjusted college students compare favorably in academic ability with adjusted college students. In academic achievement a difference was noted in favor of the adjusted group.

## CHAPTER III

### PROCEDURES FOR SOLUTION OF THE PROBLEM

Before a comparison of measures of ability and achievement could be made, it was necessary to collect specific information about each pupil included in the study. A data card, a replica of which is shown in Figure 1, was filled in for each pupil. Information from the card was used in ranking the pupils for the purposes of making correlations and quintile classifications for the sophomore, junior and senior classes. The names of the pupils in each class were ranked as mentioned in Chapter I above, and correlations of intelligence as measured by the Otis Self-administering Test of Mental Ability with achievement, as measured by the Iowa Tests of Educational Development were computed for each class. (All names of pupils appearing in this study are fictitious). Spearman's Formula for finding correlation by the rank-difference method was used.

The coefficient of correlation between ability to learn as measured by the Otis test and achievement as measured by the Iowa tests was found to be  $.74 \pm .03$  for the pupils in the sophomore class. In the junior class a correlation of  $.821 \pm .03$  was obtained. The correlation for the senior class was  $.803 \pm .03$ . All correlations computed were positive. Although these correlations were higher than those found by

Name _____
Date of birth _____
Attendance record _____
Highest I. Q. pupil has on record _____
Score on Iowa Test of Educational Development _____
Three highest ratings in Kuder Preference Record: _____, _____, _____
Rank in scholarship _____
Grades earned in four subjects during the year: _____, _____, _____, _____

Figure 1

REPLICA OF DATA CARD

other men who made similar studies, they may have resulted from the use of two tests which measured nearly the same thing.

St. John<sup>1</sup> in analyzing coefficients of correlation of intelligence with tests in reading and arithmetic according to Rugg's standards, found the average correlation to be .56. Green<sup>2</sup> in comparing the relationship between intelligence and the ability to learn as determined by performance tests administered to eleventh grade pupils obtained a correlation of  $.54 \pm .11$ . Assum and Levy<sup>3</sup> in comparing academic ability and achievement of two groups of college students found the correlation to lie between .35 and .40. One authority, W. W. Clark<sup>4</sup>, in evaluating school achievement in basic skills in relation to mental ability found that positive correlation in

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<sup>1</sup>Charles W. St. John, Educational Achievement in Relation to Intelligence (Cambridge, Massachusetts: Harvard University Press, 1930), p. 102

<sup>2</sup>Clinton Wallace Green, "Relationship Between Intelligence as Determined by Intelligence Tests and the Ability to Learn as Determined by Performance or Learning Tests," Journal of Educational Research, 47:191-200, November, 1953.

<sup>3</sup>A. L. Assum, and S. J. Levy, "Comparative Study of the Academic Ability and Achievement of Two Groups of College Students," Journal of Educational Psychology, 38:307-310, May, 1947.

<sup>4</sup>W. W. Clark, "Evaluating School Achievement in Basic Skills in Relation to Mental Ability," Journal of Educational Research, 46:179-191, November, 1952.

the vicinity of .70 often resulted from such a comparison.

Another ranking was made of the names listed under headings: Rank on Otis Self-Administering Test of Mental Ability and Rank on Iowa Tests of Educational Development as explained in Chapter I above. From this second arrangement of names in two columns, it was possible by drawing lines connecting a pupil's name in one list with his name in the other list to determine his status in achievement as related to his status in mental ability. Oblique lines on the ranking indicated pupils whose tested ability to learn differed from their achievement. A quintile classification which better illustrates this difference was made for each class. (See Figures 2, 3, and 4).

Believing that a breakdown or distribution of intelligence among all the high school students would be helpful in making a comparison of measures of ability and achievement Table I was prepared. The intelligence quotients used were taken from scores made on the Otis Self-administering Test of Mental Ability.

In order to establish whether pupils were of normal age, underage, or overage for their grade, an age-grade distribution table of all the pupils in the high school was prepared. These data are presented in Table II. The Table reveals that 14 per cent of the girls and 19 per cent of the boys were overage. It also indicates that 29 per cent of the girls and 30 per cent of the boys were underage. The greatest extremes occurred in the sophomore class where the

TABLE I

MENTAL ABILITY OF PUPILS AT CHINOOK

Range		Ninth grade	Tenth Grade	Eleventh Grade	Twelfth Grade
I. Q.	Percentile				
Over 124	Over 94	3	11	13	13
117 -124	85-94	11	16	14	13
109 -116	70-84	13	24	16	10
92 -108	31-69	29	25	16	19
84 -91	16-30	7	4	5	1
76 -83	6-15	4	0	1	1
Below 76	Below 6	0	1	0	0
Total		67	81	65	57

ages ranged from 13 to 19 years. It was found that 53 per cent of the pupils in high school were of the normal age for their grade. Slightly less than 17 per cent were retarded, and 30 per cent were accelerated.

With all this information at hand, case data cards were made for all pupils in the sophomore, junior, and senior classes whose tested ability to learn differed widely from their achievement. Studies were made only of pupils whose difference in classification based on ability and achievement was greater than one quintile. This, according to Germane and Germane is common practice

Because of the limitations of tests of achievement, whether standardized or teacher-made, the status of the student is not considered serious if his classification based on achievement on the Quintile Ranking is only one quintile above or below what it is in ability.<sup>7</sup>

Examination of the quintile classification for the sophomore class (see Figure 2) revealed that nineteen pupils, eleven boys and eight girls were over-achieving. In the same class fifteen girls and nine boys were under-achieving. This meant that in this group 23 per cent, or approximately one-fourth of the class was over-achieving, while 30 per cent, or nearly one third of the class was under-achieving. Twelve of the most extreme cases were selected for study. These were pupils whose classifications based on achievement were two or more quintiles above or below their classifications based on ability to learn.

In the junior class, eleven boys and seven girls were

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<sup>7</sup>Charles E., and Edith G. Germane, Personnel Work in the High School (New York: Silver Burdett Company, 1941), pp. 97-114.

TABLE II  
AGE-GRADE DISTRIBUTION OF HIGH SCHOOL ENROLLMENT

Grade	Nine			Ten			Eleven			Twelve			Total by Ages		
	Boys	Girls	Total	Boys	Girls	Total									
12 years	1	9	10										1	11	12
13 years	9	15	24	12	11	23							9	26	35
14 years	13	6	19	24	28	52	10	12	22				25	47	72
15 years	12	1	13	3	3	6	18	18	36	9	9	18	32	31	63
16 years	2		2	3		3	2	3	5	12	22	34	16	25	41
17 years				1	1	2	1	1	2	3	5	8	4	7	11
18 years				1	1	2	1	1	2				1	1	2
19 years															
<b>Grade Totals</b>	<b>37</b>	<b>31</b>	<b>68</b>	<b>42</b>	<b>46</b>	<b>88</b>	<b>31</b>	<b>34</b>	<b>65</b>	<b>24</b>	<b>37</b>	<b>61</b>	<b>134</b>	<b>148</b>	<b>282</b>
<b>Under age</b>	<b>10</b>	<b>9</b>	<b>19</b>	<b>12</b>	<b>13</b>	<b>25</b>	<b>10</b>	<b>12</b>	<b>22</b>	<b>9</b>	<b>10</b>	<b>19</b>	<b>41</b>	<b>44</b>	<b>85</b>
<b>Overage</b>	<b>14</b>	<b>7</b>	<b>21</b>	<b>6</b>	<b>5</b>	<b>11</b>	<b>3</b>	<b>4</b>	<b>7</b>	<b>3</b>	<b>5</b>	<b>8</b>	<b>26</b>	<b>21</b>	<b>47</b>

over-achieving. Among those under-achieving were six boys and seven girls. Considerably more pupils were over-achieving in this class than were under-achieving. Twenty-eight per cent of those tested were over-achieving while twenty per cent were underachieving. Eight pupils were chosen from this class for study.

More than one-third of the pupils in the senior class was over-achieving according to the quintile classification for this group. Eight of these were boys and ten were girls. Among those under-achieving were three boys and seven girls. This was actually 19 per cent of the class. Only three pupils were selected for study from this class.

The study thus far has shown that of the 197 subjects tested a total of forty-seven, or 23 per cent were found to be under-achieving. Fifty-five pupils, or 27 per cent of those tested were over-achieving. The highest per cent of under-achievement occurred among the pupils of the sophomore class. The highest per cent of over-achievement was found in the senior class. A tendency for over-achievement among pupils in the upper classes was observed.

	PETER		PAT ANTON JAN ETTA	TIM NORM HUGH GENE DENNIS BLAKE HUGO MARION RYA RHODA EVA
5				
A C H I E V E M E N T	OLAF LLOYD	MICHAEL	ELSIE LANA BEN SARA	PHIL BELLE NED JILL VAN NAT DABBS
4				
	WILLIS EDITH	HANS NELL PEG	DORIS EVE ILA JESSIE	NICK WILL ALMA KERR
3				
	FRITZ SID	LOU LULU VIOLA MARTA EINAR KATE	BERTA NEVA ELLIS LOLA	GWEN
2				
	PAM WILLA MAX JED VERNA BLAIR MARIA ROBE ALEX GLEN	EIDE MARGE NANCY ROXA ALVA	CAROL HOPE	AGNES
1				
	I	II	III	IV
				V

Figure 2

ABILITY TO LEARN

SOPHOMORE CLASS

SOPHOMORE CLASS CASES ANALYZED

The case of Michael. This sixteen-year old boy was having a difficult time in school. His scholastic marks for the year were as follows: English, D; current history, C; biology, C; and economics, C. In a class of 68 he ranked ninth from the bottom scholastically. Yet, in the quintile classification he ranked in the fourth quintile in achievement.

He attended school 175 days during the year.

Test results:

Intelligence	107	I. Q.	(Otis)
Achievement	17		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 2
Rank in achievement	quintile 4

Vocational interest:

Kuder percentiles-- musical 91,  
mechanical 88, persuasive 87.

Report by counselor and four high school teachers

Michael had a feeling of inferiority. His father berated him openly for his deficiencies. This caused the boy much unhappiness. The knowledge that both his parents were college graduates only increased this feeling, and his attempts to succeed were tempered by his constant fear of failure.

The case of Agnes. A farm girl mature for her age, Agnes, entered high school from a small two room rural school.

Her parents were farmers who had completed elementary schooling. Her scholastic record is as follows: English, C; biology, C; economics, C; and plane geometry, D. She ranked thirty-fifth in a class of sixty-eight.

She attended school 170 days during the year.

Test results:

Intelligence	121	I. Q.	(Otis)
Achievement	13		(Iowa)

Quintile classification:

Rank in ability to learn   quintile 5

Rank in achievement       quintile 2

Vocational interest:

Kuder percentiles-- clerical 93,

computational 88, literary 73,

Claimed interest- stenographic work

Report by counselor and four high school teachers

Agnes was indifferent toward all school work except the commercial subjects. She achieved success in typing, bookkeeping, and shorthand and spent little time on other subjects. Since the Iowa test did not include these subjects, results obtained in this classification may not have been valid in her case. During the school term, Agnes fell in love with a senior boy in her sophomore year and this had a detrimental effect upon her school work.

The case of Willis. Willis was nearly two years overage for his grade. He was the son of Scotch-Irish parents only one of which finished the elementary school. He ranked

fifty-first in a class of 68. His scholastic marks for the sophomore year were: Economics, D; English, C; plane geometry, D; and biology, C.

He attended school 151 days during the year.

Test results:

Intelligence	94	I. Q.	(Otis)
Achievement	16		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 1
Rank in achievement	quintile 3

Vocational interest:

Kuder percentiles-- computational 93,  
mechanical 92, outdoor 85.

Claimed interest- agriculture.

Report by counselor and four high school teachers

Willis's scholastic record has been consistently low in all subjects since entering high school. He has the unenviable reputation of being lazy, crooked and anti-social. He has not tried to adjust to high school life, nor to cooperate with his teachers. He had been a discipline problem in the rural elementary school which he attended, and he tried to continue in the same pattern after he entered high school.

The case of Edith. Fifteen-year old Edith was a well adjusted young woman who had entered the Chinook schools in the second grade. Her scholastic marks for the sophomore year were: Current history, D; English, C; economics, D;

biology, C. She ranked forty-fifth in a class of 68.

She attended school 174 days during the year.

Test results:

Intelligence 102 I. Q. (Otis)

Achievement 14 (Iowa)

Quintile classification:

Rank in ability to learn quintile 1

Rank in achievement quintile 3

Vocational interest:

Kuder percentiles-- scientific 87,

mechanical 83, social service 65.

Report by counselor and four high school teachers

Edith was a conscientious, hardworking pupil who was strongly motivated to study by her parents. It was the general opinion among the teachers that she attained her high rank in achievement by overworking.

The case of Hope. Hope was a seventeen-year old sophomore who evidenced little interest in school. She earned the following scholastic grades during the year: Latin, C; algebra, C; English, C; and biology, C. In a class of 68 she was forty-fifth.

She attended school 175 days during the year.

Test results:

Intelligence 112 I. Q. (Otis)

Achievement 10 (Iowa)

Quintile classification:

Rank in ability to learn quintile 3

Rank in achievement                      quintile 1

Vocational interest:

Kuder percentiles-- artistic 88,  
scientific 64, mechanical 50.

Claimed interest- live on a farm, housewife.

Report by counselor and four high school teachers

Hope was suffering from an inferiority complex. She was an extremely introverted young woman who had been forced by parents to study subjects in which she had no interest. Her attitude of indifference and frustration might be partially explained by her age as compared to that of her classmates.

The case of Carol. Carol, a girl nearly sixteen years of age, with average mental ability was not achieving in comparison to her ability to learn. Her case was a problem of educational adjustment. Her marks for the sophomore year were as follows: English, C; plane geometry, D; home economics, C; biology, C. She ranked twenty-fifth in a class of 68.

She attended school 169 days during the year.

Test results:

Intelligence	114	I. Q.	(Otis)
Achievement	10		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 3
Rank in achievement	quintile 1

Vocational interest:

Kuder percentiles-- mechanical 94,

musical 78, scientific 60.

Report by counselor and four high school teachers

Carol came to high school from a small rural school, and she found it difficult to adjust to life in a larger school system. Marks earned in the subjects studied during her sophomore year compared favorably with her rank in achievement. It was noted that her father was deceased and she was living in the home of a neighbor.

The case of Gwen. A large girl for her age, Gwen at fifteen, had the appearance of an adult. She came from Scotch-Irish stock. Her father had completed high school and her mother two years of college. Her marks during her sophomore year were: English, C; world history, C; biology, C; English 11, C. She ranked twenty-eight in a class of 68. She attended school 97 days during the year.

Test results:

Intelligence	115	I. Q.	(Otis)
Achievement	12		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 4
Rank in achievement	quintile 2

Vocational interest:

Kuder percentiles-- computational 91,  
artistic 70, scientific 62.

Claimed interest- ranch life.

Report by counselor and four high school teachers

Gwen received her elementary education in a rural

school sixty miles from the nearest railroad. She was strictly an outdoor girl and was interested first of all in athletics and horses. She was not in the least interested in school. She had a part time job in the bank and would often miss school to do extra work there. Her record of attendance shows that she was absent 83 days during the year.

The case of Lyle. This is the case of a sixteen-year old boy of superior intellect who was doing inferior academic work. His scholastic marks at the end of the year were: English, D; plane geometry, D; General business, C; and biology, C. Despite his high score on the Otis test of Mental ability his rank was fiftieth in a class of 68.

He attended school 163 days during the year.

Test results:

Intelligence	126	I. Q.	(Otis)
Achievement	16		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 5
Rank in achievement	quintile 3

Vocational interest:

Kuder percentiles-- mechanical 95,  
scientific 86, persuasive 36.

Report by counselor and four high school teachers

Family troubles were largely to blame for Lyle's disparity in rank of ability and achievement. The parents were on the verge of a divorce as the school term ended. He was emotionally and socially maladjusted because of his

home environment and this was reflected in his academic achievement. The teachers felt that Lyle, who was very small physically, overcompensated for his size by his social activities to the detriment of his scholastic attainments.

The case of Nolan. This lad of sixteen has a poor scholastic record compared with his record on the Otis Test of Mental Ability. During his sophomore year he earned these marks: Economics, C; current history, C; English, D; and biology, D. He ranked fifty-eight in a class of 68.

He attended school 165 days during the year.

Test results:

Intelligence	124	I. Q.	(Otis)
Achievement	16		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 5
Rank in achievement	quintile 3

Vocational interest:

Kuder percentiles-- literary 93,  
artistic 88, outdoor 75.

Report by counselor and four high school teachers

Neither of Nolan's parents completed the elementary school curriculum. He has had little encouragement from home to excel scholastically, and he has made poor adjustment as a student in a high school of this size. He has engaged in outside activities with little regard for the consequences to his academic record in school or the affect upon his success in school.

The case of Lloyd. Lloyd's report showed that his scholastic marks during his sophomore year were: English, D; plane geometry, D; world history, D; and mechanical drawing, C. In a class of 68 he ranked sixty-fourth. He was fifteen years of age.

He attended school 173 days during the year.

Test results:

Intelligence	101	I. Q.	(Otis)
Achievement	17		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 1
Rank in achievement	quintile 4

Vocational interest:

Kuder percentiles-- mechanical 91,  
outdoor 83, scientific 75.

Report by counselor and four high school teachers.

The father let the boy know during his freshman year that he expected him to have high grades. The father and mother were both college graduates and this probably motivated the boy to overachieve. His scholastic marks earned during the year were consistently low.

The case of Olaf. Olaf was the second child in a family of four children. His father and grandfather before him were college graduates. His mother was also a college graduate. All his elementary training had been in the local grade school. His age was sixteen and a half years. His scholastic grades during the year were: English, C; biology, C;

geometry, C; and economics, C. In a class of 68 he ranked twenty-sixth.

He attended school 172 days during the year.

Test results:

Intelligence	101	I. Q.	(Otis)
Achievement	17		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 1
Rank in achievement	quintile 4

Vocational interest:

Kuder percentiles-- artistic 89,  
mechanical 69, musical 65.

Olaf was strongly motivated to excel by his parents. He was never allowed to forget that his father was a college graduate. Although his mental ability was limited, his achievement was high largely because he was a hard-working student.

The case of Peter. This lad at seventeen was nearly two years overage for his grade. His marks from the permanent record for his sophomore year were: English, B; biology, C; economics, C; geometry, A. He ranked twenty-fourth in a class of 68.

He attended school 171.5 days during the year.

Test results:

Intelligence	109	I. Q.	(Otis)
Achievement	19		(Iowa)

Quintile classification:

Rank in ability to learn      quintile 2  
Rank in achievement            quintile 5

Vocational interest:

Claimed interest- agriculture  
Kuder percentiles-- mechanical 92,  
outdoor 88, musical 86.

Report by counselor and four high school teachers.

Peter was a strongly introverted boy, studious in nature, and determined to amount to something. A farm lad, he was intensely interested in agriculture. Some teachers believed that he showed lack of confidence, and that he was compensating in achievement for a feeling of inferiority.

II. JUNIOR CLASS CASES ANALYZED

The case of Milo. A junior boy, seventeen years of age, Milo is so short that he might easily be mistaken for a grade school youngster. His father is a high school graduate and his mother finished the eighth grade. His scholastic marks for the junior year were: American Government, C; general business, B; English, C; and Typing, B. He stood twenty-eighth from the top in a class of 62.

He attended school 171.5 days during the year.

Test results:

Intelligence      104      I. Q.      (Otis)  
Achievement      13.9                      (Iowa)

Quintile classification:

Rank in ability to learn      quintile 2  
Rank in achievement            quintile 4

		JULIAN	MADGE BOYD CRAIG HULDA	MERL EDNA DAWN TAD MANUS ETHEL JAKE CLARE VIC FREDA
5				
	VERNON LEO MILO	OTTO DINA CARL	PENNY VIOLET IRMA OLE	LYNN
4				
	HILDA	VERA ASA DAN LAURA	LEM ROY FERN NAN RENE	ALTON MURIEL EVAN JO
3				CLARA
	GARR KATHY	HERB ERIC DANA ARDEN	RUDE VAL IRL	GRACE
2				
	LUCY ROBIN LEE MAUD ADAM NETTIE POLLY CHRIS PEARL	NORA OLIVE	DENISE	
1				
	I	II	III	IV
				V

Figure 3

ABILITY TO LEARN

JUNIOR CLASS

Vocational interest:

Kuder percentiles-- musical 88,  
clerical 88, scientific 69.

Report by counselor and four high school teachers

Milo seemed determined to compensate for his small physical stature by excelling in the scholastic and athletic fields. He managed to earn letters in both basketball and football despite his physical handicap. His energy and resolute perserverance were decisive factors contributing to his high rank in achievement. It was also noted that he was a year overage for his grade.

The case of Leo. Leo, two years overage for his grade ranked in the lowest third of his class academically. His scholastic marks for the year were: English, C; American Government, C; Typing, B; and agriculture, C.

He attended school 174 days during the year.

Test results:

Intelligence	104	I. Q.	(Otis)
Achievement	14		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 2
Rank in achievement	quintile 4

Vocational interest:

Kuder percentiles-- social service 78,  
persuasive 71, artistic 69.

Report by counselor and four high school teachers

School was not easy for Leo. A desire to maintain

eligibility for competitive sports motivated him to do the minimum amount of work required. He had been waited on and indulged in so much by his mother that it was difficult for him to think or act for himself. It was known that he received help at home on his assignments. He was listless and unenthusiastic about all academic work.

The case of Julian. This is the case of a pupil who received all of his education in the Chinook schools. His marks in the subjects studied as a junior were: American Government, C; typing, B; English, C; Agriculture, C. His chronological age was 17 years. He ranked in the upper one-third of his class.

He attended school 170 days during the year.

Test results:

Intelligence	115	I. Q.	(Otis)
Achievement	16.8		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 3
Rank in achievement	quintile 5

Vocational interest:

Claimed interest- salesmanship

Kuder percentiles-- mechanical 100,

social service 88, scientific 78.

Report by counselor and four high school teachers

There were several reasons why Julian ranked high in achievement. First, his mother requested that his work be of high quality, secondly, he wanted to do as well as his

siblings had done before him, and finally, he was trying to earn a place in the local chapter of the National Honor Society. He was industrious in his habits and aggressive in the pursuit of academic knowledge.

The case of Vernon. This seventeen-year old junior boy was a joy to his parents and teachers. Both of his parents had graduated from high school. Vernon received the following marks in his junior year: English, B; economics, B; typing, B; and American history, B. He ranked in the upper fourth of his class scholastically.

He attended school 161.5 days during the year.

Test results:

Intelligence	110	I. Q.	(Otis)
Achievement	15.3		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 2
Rank in achievement	quintile 4

Vocational interest:

Kuder percentiles-- musical 99,  
social service 85, artistic 64.  
Claimed interest- agriculture.

Report by counselor and four high school teachers

Vernon came from an excellent home, and he knew from the beginning that he was expected to do good work scholastically. He was a conscientious student who took great pride in doing every thing well. His high rank in achievement came as no surprise to his teachers.

The case of Hilda. Although a pupil of inferior intellect as measured by Otis test of mental ability, this young woman attained a high rank in achievement. Her marks earned during the junior year were: World history, D; Home economics, A; American history, D; and typing, C. Her scholastic ranking was thirty-third in a class of 62.

She attended school 175 days during the year.

Test results:

Intelligence	89	I. Q.	(Otis)
Achievement	13.5		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 1
Rank in achievement	quintile 3

Vocational interest:

Kuder percentiles-- mechanical 93,  
computation 84, scientific 80.

Report by counselor and four high school teachers

This girl was fortunate in having a home where genuine love and affection was felt among its members. Hilda was a painstaking pupil who really earned her scholastic marks by hard work. She would do everything a teacher asked and more.

The case of Clara. Clara's junior year was rather an unhappy one. She was seventeen years old at the time. The marks earned in the several subjects she studied reflect the emotional stress she experienced. In English, she received a C; general business, B; typing, B; and American government,

C. In a class of 62 she ranked twenty-fourth.

She attended school 160 days during the year.

Test results:

Intelligence	126	I. Q.	(Otis)
Achievement	13.8		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 5
Rank in achievement	quintile 3

Vocational interest:

Kuder percentiles-- clerical 86,  
artistic 84, computation 64.

Claimed interest- live on a ranch.

Report by counselor and four high school teachers

The teachers felt that several factors were involved in Clara's case. Her oldest brother was critically injured in a rodeo accident in September. During the winter her father passed away. She lived in a rented room and worked part-time in a cafe for her board. Having lived most of her life on a ranch, her interest in horses and the freedom of ranch life exceeded her interest in school. She was a precocious young woman who implied that she was too grown up to be a high school pupil.

The case of Grace. This young woman had many problems which troubled her during her junior year. A bright pupil, she ranked twenty-ninth in a class of 62. Her grades were: shorthand, B; plane geometry, D; American history, B; and typing, C.

She attended school 171.5 days during the year.

Test results:

Intelligence	120	I. Q.	(Otis)
Achievement	11.6		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 4
Rank in achievement	quintile 2

Vocational interest:

Kuder percentiles-- Literary 86,  
musical 83, social service 83.

Report by counselor and four high school teachers

Grace was extremely unstable emotionally and before the year ended she experienced a nervous breakdown. There were several factors that brought about this collapse. The home lacked economic stability and Grace worried about finances. She worked hard in school and then worked in a cafe until 4 o'clock in the morning. Her parents were divorced. The mother remarried and in a few months separated from her second mate. All this had a devastating effect upon Grace's scholastic efforts.

The case of Denise. This seventeen-year old Miss was one moderately successful in her academic efforts. Her scholastic marks during her junior year were as follows: shorthand, C; typing, C; Latin, C; and American history, C. In a class of 62 she was twenty-sixth from the bottom.

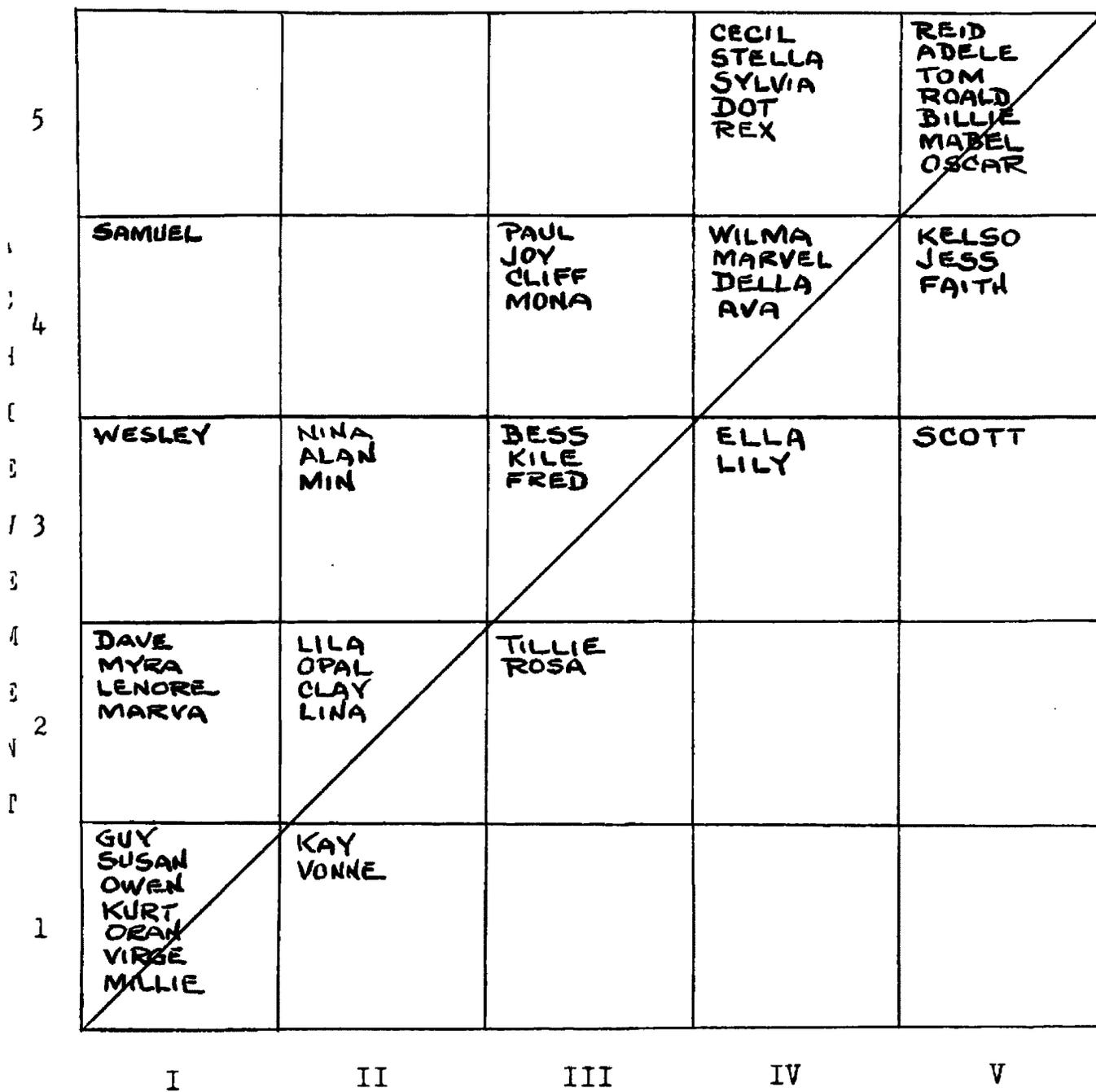


Figure 4

ABILITY TO LEARN

SENIOR CLASS

She attended school 158.5 days during the year.

Test results:

Intelligence	112	I. Q.	(Otis)
Achievement	9.3		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 3
Rank in achievement	quintile 1

Vocational interest:

Kuder percentiles-- musical 93,  
persuasive 85, computation 84.

Report by counselor and four high school teachers

Denise, the youngest daughter in a family of three girls, had always been babied by her parents and sisters. She was slow in developing and had acquired an inferior complex because of the difference in age between herself and the rest of her classmates. Denise came from a wealthy family and was always provided with too much spending money. She saw no economic reason for an education.

### III. SENIOR CLASS CASES ANALYZED

The case of Scott. Scott came from a good home where he lived with his parents, a brother and two sisters. The mother finished high school but the father quit in his junior year. His grades during his senior year were: general business, B; current history, B; English, B; economics, B. Scott ranked thirteenth from the top in a class of 57.

He attended school 172.5 days during the year

Test results:

Intelligence	126	I. Q.	(Otis)
Achievement	18		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 5
Rank in achievement	quintile 3

Vocational interest:

Kuder percentiles-- social service 91,  
persuasive 80, musical 75.

Claimed interest- Insurance Salesman,  
Public Accountant.

Report by counselor and four high school teachers

Scott was a strong extrovert. He was good at promoting himself as was evidenced by his school activities. He joined the band, F. F. A., and the annual staff. He went out for basketball and football and was elected a member of the National Honor Society, he was also elected president of the student council. Scott was satisfied with the grades he received and felt no challenge to do his best. He gave the impression that he knew more than the teachers.

The case of Samuel. Seventeen-year old Samuel spent his entire boyhood in Chinook where he received all his elementary school training. Both his parents were high school graduates. His senior year scholastic marks were: English, C; Chemistry, C; typing, B; and general business, B. He ranked thirty-seventh in a class of 57.

He attended school 173.5 days during the year.

Test results:

Intelligence	103	I. Q.	(Otis)
Achievement	19		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 1
Rank in achievement	quintile 4

Vocational interest:

Kuder percentiles-- scientific 85,  
persuasive 80, clerical 73.

Claimed interest- science, psychology  
or English.

Report by counselor and four high school teachers  
Samuel was a very large boy weighing nearly 200  
pounds. He may have been overachieving to compensate for  
this physical handicap which prevented him from competing  
in athletics. He was somewhat of an extrovert which may  
also have been attributed to his size. He did careful work  
and was considered a conscientious student. His extra-  
curricular activities included membership in the pep club  
and the annual staff.

The case of Wesley. This twenty-year old senior was  
the product of a farm home where he had to work hard much of  
the time. He was nearly three years overage for his grade  
due to having missed school to help on the farm. His marks  
during the senior year were: mechanical drawing, C; English,  
C; current history, C; economics, C. He ranked sixth from  
the bottom in a class of 57 scholastically.

He attended school 164.5 days during the year.

Test results:

Intelligence	89	I. Q.	(Otis)
Achievement	18		(Iowa)

Quintile classification:

Rank in ability to learn	quintile 1
Rank in achievement-	quintile 3

Vocational interest:

Kuder percentiles-- musical 91,  
persuasive 84, social service 84.

Claimed interest- work on ranch until  
drafted.

Report by counselor and four high school teachers.

Wesley received little encouragement to study from home. His parents were divorced and his mother had remarried. It was apparent that he was suffering a feeling of inferiority. This was likely due to his being overage for his grade.

## CHAPTER IV

### SUMMARY AND CONCLUSIONS

#### I. SUMMARY

The purpose of this paper was to compare pupil ability and achievement, to establish the extent of under-achievement and over-achievement, and to identify for school administrators and teachers certain individuals whose achievement scores were considerably above or below their ability scores.

Certain assumptions were made and definite limits established controlling the extent of the study, and defining the number of subjects who were to be considered.

To accomplish the aims stated earlier certain data were collected and organized. This data consisted of pupil's scores on standardized tests, information of personal and scholastic nature taken from permanent school records, and reports by the administrator and teachers concerning individuals who had been selected as subjects for study.

An average correlation of ability to learn, with achievement was found by the rank-difference method. Scores from standardized intelligence tests and standardized achievement tests of 197 pupils enrolled in the Chinook High School were used. The results of the correlations were compared with the findings of others who had made similar studies.

Quintile classifications were made of the pupils in

the sophomore, junior and senior classes. Pupils whose tested ability to learn differed considerably from their achievement were selected for special study.

Comparison of pupil ability and achievement. The writer found that the average coefficient of correlation between ability to learn and achievement in the Sophomore Class was  $.74 \pm .03$ ; in the junior class,  $.821 \pm .03$ ; and in the senior class,  $.803 \pm .03$ . These correlations were higher than those found by other investigators. Their correlations between ability to learn and achievement were always positive, and varied from .35 to .70. The average correlation usually found by others writing on the subject was in the vicinity of .50.

Extent of under-achievement and over-achievement. Evidence was found of variation in achievement both above and below the normal quintiles in intelligence. However, the picture appeared brighter when only those cases were considered whose classification based on achievement was two or more quintiles above or below that of ability. The total number of such cases was twenty-three. This meant that according to the results obtained in this comparison, 11.6 per cent of the 197 pupils studied were in need of help.

Identification of pupils who were under-achieving or over-achieving. In the sophomore class were twelve pupils whose classifications based on achievement were two or more quintiles above or below their classifications based on abil-

ity to learn. These included six pupils, five boys and one girl, who were under-achieving and six pupils, four girls and two boys, who were over-achieving.

Those selected for special study from the junior class included four boys and one girl who were over-achieving and three girls who were under-achieving.

Three boys from the senior class were among those whose classifications based on achievement were two or more quintiles above or below their classifications based on ability to learn. Two boys were over-achieving and one boy was under-achieving.

## II. CONCLUSIONS

The conclusions stated below are a genuine attempt to interpret the findings of the study as revealed by the facts.

1. It would be imprudent to predict academic achievement by the use of the intelligence quotient.
2. One must discount the relatively high coefficient of correlation of ability to learn with achievement which resulted from this study in view of the fact that such a wide range of coefficients of correlation were found by other investigators who made similar studies.
3. Correlations of ability to learn as measured by the Otis Self-administering Test of Mental Ability with achievement as measured by the Iowa Tests of Educational Development were found to be higher than those obtained in other studies

in which different tests were used.

4. In description of cases the overage pupils in any grade were generally found to be well toward the foot of the class educationally, whereas, the underage pupils were generally found to be well toward the head of the class.

5. Learning the identity of pupils who are under-achieving or over-achieving and establishing the extent of such deviations has value for teachers and administrators, but the greatest good to come from such a study is an awareness that all is not right with the child or the school program and something needs to be done about it.

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## APPENDIX

SOPHOMORE CLASS

- Name	Otis Self-administering Test of Mental Ability		Iowa Tests of Educational Development		Difference in Rank	
	Score	Rank	Score	Rank	D	D <sup>2</sup>
Tim	139	1	22	3	2	4
Norm	131	2	23	1.5	.5	.25
Tony	128	3	17	26.5	23.5	552.25
Janet	127	4	18	18.5	14.5	210.25
Hugh	126	6	23	1.5	4.5	20.25
Gene	126	6	20	8.5	2.5	6.25
Lyle	126	6	16	35.5	29.5	870.25
Dennis	125	9	21	4.5	4.5	20.25
Blake	125	9	20	8.5	.5	.25
Hugo	125	9	19	14	5	25
Nolan	124	11	16	35.5	24.5	600.25
Marion	122	13	20	8.5	4.5	20.25
Rita	122	13	19	14	1	1
Susie	122	13	18	18.5	5.5	30.25
Rhoda	121	16	20	8.5	7.5	56.25
Bette	121	16	17	26.5	10.5	110.25
Agnes	121	16	13	54.5	38.5	1482.25
Eva	120	18.5	19	14	4.5	20.25
Les	120	18.5	17	26.5	8	64
Pat	119	21	20	8.5	12.5	156.25
Anton	119	21	19	14	7	49
Phil	119	21	18	18.5	2.5	6.25
Jan	117	25	21	4.5	20.5	420.25
Etta	117	25	20	8.5	16.5	272.25
Belle	117	25	18	18.5	6.5	42.25
Ned	117	25	17	26.5	1.5	2.25
Nick	117	25	14	46.5	21.5	462.25
Jill	116	28.5	15	41	12.5	156.25
Will	116	28.5	14	46.5	18	324
Van	115	32.5	17	26.5	6	36
Nat	115	32.5	16	35.5	3	9
Alma	115	32.5	16	35.5	3	9
Kerr	115	32.5	15	41	8.5	72.25
Babs	115	32.5	13	54.5	22	484
Gwen	115	32.5	12	62	29.5	870.25
Berta	114	36.5	12	62	25.5	650.25
Carol	114	36.5	10	72	35.5	1260.25
Elsie	113	40	17	26.5	13.5	182.25
Doris	113	40	16	35.5	4.5	20.25
Eve	113	40	15	41	1	1
Ila	113	40	14	46.5	6.5	42.25
Jessie	113	40	14	46.5	6.5	42.25
Neva	112	43.5	13	54.5	11	121
Hope	112	43.5	10	72	28.5	812.25
Ben	111	46.5	17	26.5	20	400

Otis Self-administering Test of Mental Ability			Iowa Tests of Educational Development		Difference in Rank	
<u>Name</u>	<u>Score</u>	<u>Rank</u>	<u>Score</u>	<u>Rank</u>	<u>D</u>	<u>D<sup>2</sup></u>
Lana	111	46.5	17	26.5	20	400
Ellis	111	46.5	13	54.5	8	64
Lola	111	46.5	12	62	15.5	240.25
Sara	110	49	17	26.5	22.5	506.25
Peter	109	50.5	19	14	36.5	1332.25
Lou	109	50.5	12	62	11.5	132.25
Alva	108	52	7	78.5	26.5	702.25
Michael	107	54	17	26.5	27.5	756.25
Hans	107	54	14	46.5	7.5	56.25
Lulu	107	54	13	54.5	.5	.25
Nell	106	57	15	41	16	256
Viola	106	57	13	54.5	2.5	6.25
Marge	106	57	11	67	10	100
Peg	105	59	15	41	18	324
Marta	104	61	13	54.5	6.5	42.25
Einar	104	61	13	54.5	6.5	42.25
Eide	104	61	11	67	6	36
Kate	103	64	13	54.5	9.5	90.25
Nancy	103	64	10	72	8	64
Roxa	103	64	5	80.5	16.5	272.25
Edith	102	67	14	46.5	20.5	420.25
Pam	102	67	11	67	0	0
Willa	102	67	8	76	9	81
Olaf	101	69.5	17	26.5	43	1849
Lloyd	101	69.5	17	26.5	43	1849
Sid	100	71.5	12	62	9.5	90.25
Max	100	71.5	10	72	.5	.25
Jed	96	73	10	72	1	1
Willis	94	75	16	35.5	39.5	1560.25
Verna	94	75	11	67	8	64
Blair	94	75	11	67	8	64
Maria	91	77.5	8	76	1.5	2.25
Rose	91	77.5	7	78.5	1	1
Alex	89	79	8	76	3	9
Fritz	88	80	13	54.5	25.5	650.25
Glen	72	81	5	80.5	.5	.25

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23,058

$$e = .74 \pm .03$$

JUNIOR CLASS

<u>Name</u>	<u>Otis Self-administering Test of Mental Ability</u>		<u>Iowa Tests of Educational Development</u>		<u>Difference in Rank</u>	
	<u>Score</u>	<u>Rank</u>	<u>Score</u>	<u>Rank</u>	<u>D</u>	<u>D<sup>2</sup></u>
Merl	134	1	19.5	6	5	25
Edna	132	2	17.9	8	6	36
Dawn	131	3	20.5	3.5	.5	.25
Tad	130	4	20.5	3.5	.5	.25
Clare	129	7	19.8	5	2	4
Manus	129	7	17.3	10	3	9
Jake	129	7	16.8	14	7	49
Ethel	129	7	16.8	14	7	49
Lynn	129	7	15.9	18	11	121
Vic	127	10	18.8	7	3	9
Freda	126	11.5	20.6	2	9.5	90.25
Clara	126	11.5	13.8	28	16.5	272.25
Madge	124	13	21	1	12	144
Penny	123	14.5	16.6	16	1.5	2.25
Violet	123	14.5	15.5	19.5	5	25
Boyd	122	16	17.4	9	7	49
Craig	121	18	16.9	11.5	6.5	42.25
Alton	121	18	12.9	35.5	17.5	306.25
Muriel	121	18	12.6	40	22	484
Evan	120	20.5	13.3	33	12.5	156.25
Grace	120	20.5	11.6	42	21.5	462.25
Hulda	119	22.5	16.9	11.5	11	121
Irma	119	22.5	15.5	19.5	3	9
Ole	118	24.5	14.6	22.5	2	4
Jo	118	24.5	13.5	31	6.5	42.25
Otto	117	26.5	14.3	24	2.5	6.25
Lem	117	26.5	12.8	38	11.5	132.25
Dina	116	29	14.6	22.5	6.5	42.25
Roy	116	29	13	34	5	25
Rude	116	29	11.3	46	17	289
Julian	115	31.5	16.8	14	17.5	306.25
Fern	115	31.5	12.9	35.5	4	16
Val	114	33	11.1	47	14	196
Rene	112	35.5	16.1	17	18.5	342.25
Nan	112	35.5	11.5	43.5	8	64
Irl	112	35.5	11	49	3.5	12.25
Denise	112	35.5	9.3	55	19.5	380.25
Carl	111	38	14.1	25	13	169
Vernon	110	39.5	15.3	21	18.5	342.25
Herb	110	39.5	12.3	41	1.5	2.25
Asa	109	42.5	13.6	29	13.5	182.25
Dan	109	42.5	13.5	31	11.5	132.25
Vera	109	42.5	12.8	38	4.5	20.25
Eric	109	42.5	11.4	45	2.5	6.25
Nora	108	45	8.6	53.5	13.5	182.25
Olive	105	46	10.6	52	6	36

Name	Otis Self-administering Test of Mental Ability		Iowa Tests of Educational Development		Difference in Rank	
	Score	Rank	Score	Rank	D	D <sup>2</sup>
Leo	104	48	14	26	22	484
Milo	104	48	13.9	27	21	441
Laura	104	48	12.8	38	10	100
Arden	103	50.5	11	49	1.5	2.25
Dana	103	50.5	11	49	1.5	2.25
Garr	102	52.5	10.9	51	1.5	2.25
Lucy	102	52.5	9.3	55	2.5	6.25
Robin	100	54	9.9	53	1	1
Kathy	99	55	11.5	43.5	11.5	132.25
Lee	96	56	9.3	55	1	1
Maud	95	57	9.1	57	0	0
Adam	93	58	8.6	58.5	.5	.25
Polly	91	59.5	7.8	60	.5	.25
Nettie	91	59.5	7.3	61	1.5	2.25
Hilda	89	61	13.5	31	30	900
Chris	88	62	7	62.5	.5	.25
Pearl	80	63	7	62.5	.5	.25
						7,472.5

$$r = .821 \pm .03$$

SENIOR CLASS

<u>Name</u>	<u>Otis Self-administering Test of Mental Ability</u>		<u>Iowa Tests of Educational Development</u>		<u>Difference in rank</u>	
	<u>Score</u>	<u>Rank</u>	<u>Score</u>	<u>Rank</u>	<u>D</u>	<u>D<sup>2</sup></u>
Kelso	146	1	20	18.5	17.5	306.25
Reid	145	2	33	1	1	1
Oscar	136	3.5	26	3	.5	.25
Adele	136	3.5	25	5	1.5	2.25
Tom	134	5	28	2	3	9
Jess	132	6	21	16.5	10.5	110.25
Faith	131	7	20	18.5	11.5	132.25
Billie	129	8.5	23	10.5	2	4
Roald	129	8.5	23	10.5	2	4
Scott	126	10	18	28	18	324
Mabel	125	11	23	10.5	.5	.25
Cecil	122	13	25	5	8	64
Stella	122	13	23	10.5	2.5	6.25
Wilma	122	13	22	14	1	1
Sylvia	121	16	24	7.5	8.5	62.25
Marvel	121	16	22	14	2	4
Lily	121	16	13	41	25	625
Dot	120	20	25	5	15	225
Rex	120	20	24	7.5	12.5	156.25
Della	120	20	21	16.5	3.5	12.25
Ava	120	20	19	22	2	4
Ella	120	20	18	28	8	64
Bess	119	23	18	28	5	25
Paul	118	24	22	14	10	100
Kile	114	25	18	28	3	9
Cliff	113	27	19	22	5	25
Joy	113	27	19	22	5	25
Tillie	113	27	13	41	14	196
Mona	112	30	19	22	8	64
Fred	112	30	17	33	3	9
Rosa	112	30	12	46	16	256
Lila	110	32	14	36.5	4.5	20.25
Nina	109	33.5	18	28	5.5	30.25
Opal	109	33.5	13	41	7.5	56.25
Clay	108	35.5	16	35	.5	.25
Kay	108	35.5	9	52.5	17	289
Min	107	38	18	28	10	100
Alan	107	38	17	33	5	25
Lina	107	38	13	41	3	9
Vonne	106	40	11	49.5	9.5	90.25
Dave	104	42	13	41	1	1
Myra	104	42	13	41	1	1
Guy	104	42	11	49.5	7.5	56.25
Samuel	103	44	19	22	22	484
Lenore	102	45.5	14	36.5	9	81
Susan	102	45.5	11	49.5	4.5	20.25

	Otis Self-administering Test of Mental Ability		Iowa Tests of Educational Development		Difference in rank	
<u>Name</u>	<u>Score</u>	<u>Rank</u>	<u>Score</u>	<u>Rank</u>	<u>D</u>	<u>D<sup>2</sup></u>
Owen	100	47	17	33	14	196
Wesley	99	48.5	18	28	20.5	420.25
Kurt	99	48.5	12	46	2.5	6.25
Oran	98	50	12	46	4	16
Virge	95	51	11	49.5	1.5	2.25
Millie	90	52	9	52.5	.5	.25
Marva	82	53	13	41	12	144
						<u>4,885.25</u>

$$r = .803 \pm .03$$