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A survey to determine whether the eighth grade students of San Joaquin County are working up to their ability in language arts

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A SURVEY TO DETERMINE WHETHER THE EIGHTH GRADE STUDENTS OF SAN JOAQUIN COUNTY ARE WORKING UP TO THEIR ABILITY IN LANGUAGE ARTS

A Thesis

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CHAPTER I

INTRODUCTION

Introductory statement. This study represents a survey of selected eighth-grade students of San Joaquin County and the measurement of their ability and achievement in certain aspects of the Language Arts program of the elementary school.

It has become quite popular to criticize the instruction offered by the public schools in almost every subject, even though there are valid evidences that the mass of boys and girls in the schools are learning more in Language Arts and other school subjects than did the much smaller number of children in the schools fifty or seventy-five years ago.[1]

When mobilization for World War II occurred and thousands of young men were found who could not read fourth-grade materials, critics cited this fact as evidence that the public schools were failing to do the job they did thirty years or more ago.[2]

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1 Mildred A. Dawson, "The Teaching of Language in the Elementary School," Forty-Third Yearbook of the National Society for the Study of Education, Part II (Chicago: University of Chicago, Department of Education, 1944), p. 1.

2 Paul Witty and Ann Coomer, "How Successful is Reading Instruction," Elementary English, 28:451, December, 1951.

There are many reasons for these criticisms. One reason is the common human tendency to glorify the past. The tendency to criticize prevailing practice in schools has appeared again and again in the past. Louis Kaplan quotes from a report made in 1845 by the Grammar School Committee in Boston:

> They (test administered) show beyond all doubt that a large proportion of scholars in our first classes, boys and girls of 14 and 15 years of age, when called on to write simple sentences, to express their thoughts on common subjects without the aid of a dictionary or a master, cannot write, without errors in grammar, in spelling and in punctuation, as we should blush to see in a letter from a son or daughter of their age.[3]

The foregoing criticism is traceable in part to the common tendency to compare the present unfavorably with the past. Also, the public does realize that there is a greater heterogeneity in ability in the modern classroom. In the upper grades of the elementary schools one finds a wider range of ability than formerly. In the modern high schools there are many students who are retarded in the Language Arts, a condition which reflects the fact that the high schools are less selective today. The trend toward universal education brings to the high school pupils of a type that in past years withdrew during the elementary school years.

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[3] Louis Kaplan, "The Attack on Modern Education," The Phi Delta Kappa, 32:224.

Eighth-grade teachers are fully aware of the individual differences of each and every student. They watch with concern eighth-graders in many instances with Language Arts achievement scores varying from the second grade to the eleventh grade.

If by using the Achievement Quotient it is found that the students are working to capacity or near capacity, it would be important for teachers to know that they are doing a good teaching job with modern-day students.

I. THE PROBLEM

Statement of the problem. The problem for this study may be stated in a question: Are eighth-grade students in San Joaquin County Elementary Schools working up to their ability in Language Arts? The four phases of Language Arts considered are: Comprehensive Reading, Vocabulary, Spelling, and English. The purpose of this study will, therefore, be to determine the relationship between their Language Arts achievement and their Mental Age.

Delimitation of the study. This study has been delimited as described below:

Three hundred twelve eighth-grade students of twenty-one county elementary schools tested under the

jurisdiction of the San Joaquin County Superintendent's Office were used in this study.

The students used took the Metropolitan Achievement Test, Form S, and the Otis Quick-Scoring Mental Ability Test, Beta Test: Form B.

The students used were from schools of under four hundred average daily attendance.

Justification for the study. The justification for the study is found in the need to investigate: (1) whether eighth-grade youngsters are working up to their ability in Language Arts; and (2) whether the critics of modern-day education have justification in saying that the present-day school does not meet the Language Art needs of students.

Through observation and personal contact with teachers and administrators made in the discharge of duties as a Consultant in Elementary Schools of San Joaquin County, certain misconceptions of the values and results of the Language Arts program were noted.

Data regarding whether the modern-day Language Arts program was getting results or not were needed for the entire county, if critics were to be answered. The problem was selected as one of personal professional value.

Source of data. The data for this study were obtained from the following sources: (1) test records of the office of the San Joaquin County using the Metropolitan Achievement Test, Form S results, and the Otis Quick-Scoring Mental Ability Test, Beta: Form B results, and (2) critical literature in the field.

Procedure. Two techniques of procedure were used to complete this survey. The first technique used involved using the data obtained from those eighth-grade students who took both the Metropolitan Achievement Tests, Form S, and the Otis Quick-Scoring Mental Ability Test, Beta B. The second procedure was to find the Achievement Quotient (A.Q.) of the selected eighth-grade students in the four phases of Language Arts consisting of: Reading, Vocabulary, Spelling and English.[4]

The A.Q. (Achievement Quotient) is used to represent the relationship between the educational level and ability level. The formula for the A.Q. is as follows:[5]

$$A.Q. = 100 \frac{EA}{MA} = \frac{EQ}{IQ} = 100 \frac{\frac{EA}{CA}}{\frac{MA}{CA}}$$

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[4] Infra, Appendix A, page 57.

[5] Harry A. Greene, and others, Measurement and Evaluation in the Elementary School (New York: Longsman, Green and Company, 1942), p. 239.

Official approval of the Assistant County Superintendent of San Joaquin County Schools directing the education division was first secured. It was felt that this was necessary as the eighth-grade test results from San Joaquin County Schools were going to be used.

II. DEFINITION OF TERMS USED

The definitions of the terms are listed alphabetically in the Dictionary of Education.[6] These definitions are:

Chronological Age. Chronological Age is the amount of time that has elapsed since an individual's birth.

English Age. An expression of English ability in terms of age based on pre-established norms is English Age.

Mental Age. Mental Age is the level of a person's mental ability expressed in terms of the median Chronological Age of persons having the same level of mental ability. (Thus, if a child's mental ability is equal to that of the average nine-year-old, he has a Mental Age of nine years, regardless of his actual Chronological Age.)

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6 Carter V. Good, editor, Dictionary of Education (New York: McGraw-Hill Book Company, Inc., 1945), pp. 1-495.

Intelligence Quotient. The most commonly used device for expressing level of mental development in relation to Chronological Age--Intelligence Quotient--is obtained by dividing the Mental Age (as measured by a general intelligence test) by the Chronological Age and multiplying by one hundred.

Reading Age. Reading Age is an expression of reading ability in terms of age, based on pre-established norms. (Thus, if a child reads as well as the typical twelve-year-old, his reading age is twelve years, regardless of his actual Chronological Age.)

Spelling Age. Spelling Age is an expression of spelling ability in terms of age, based on pre-established norms.

Vocabulary Age. Vocabulary Age is an expression of vocabulary ability in terms of age, based on pre-established norms.

Achievement Quotient. An index of a person's achievement relative to capacity, presumably showing the ratio of his actual level of accomplishment to what he is capable of achieving is a person's Achievement Quotient, and is usually obtained by dividing his Achievement Age by

his Mental Age, and multiplying the result by one hundred.

Language Age. Language Age is an expression of the total Language Arts ability in terms of age, based on pre-established norms.

Achievement Age. Achievement Age is the age equivalent of an individual's raw score on an achievement test as shown by age norms for the test in question. Thus, an Achievement Age of eight years and four months signifies that the pupil's achievement is equal to the average achievement of children aged eight years and four months: may be applied with reference to a single school subject or a group of school subjects.

Symbols. As defined by the above, the following standardized symbols are used in the discussion:

A. A.	Achievement Age
A. Q.	Achievement Quotient
C. A.	Chronological Age
E. A.	English Age
L. A.	Language Age
I. Q.	Intelligence Quotient
M. A.	Mental Age
R. A.	Reading Age

S. A. Spelling Age

V. A. Vocabulary Age

CHAPTER II

RELATED STUDIES

Purpose of the chapter. The purpose of this chapter is to present the summaries of findings which are related to this study.

I. REVIEW OF RELATED LITERATURE

While there is an abundance of material relating to studies made in the fields of reading, language, grammar, and composition, there seems to be a rather limited amount dealing with the mental ability and the Language Art achievement capacity of the upper grade elementary school student.

In "The Teaching of Language in the Elementary School," the Forty-Third Yearbook of the National Society for the Study of Education, Part II,[1] Trabue describes the status of Language Arts in the schools. He points out that the mass of boys and girls are learning more in most school subjects than did the smaller number of pupils in school seventy-five years ago, adding that in spite of these

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[1] Mildred A. Dawson, "The Teaching of Language in the Elementary School," Forty-third Yearbook of the National Society for the Study of Education, Part II (Chicago: University of Chicago, Department of Education, 1944), pp. 168-69.

improvements, however:

> Too few teachers have yet developed the thorough understanding of the learning process that would lead them to adapt their instruction successfully to the individual interests, needs, and capacities of their pupils. In some schools the teaching is actually producing attitudes and habits that prevent students both immediately and in later life, from participating freely on discussions and from writing useful records, or even letters to their relatives and friends.[2]

Ruth G. Strickland[3] says that the development of the Language Arts occupies almost the entire school day. Language is taught from the time the first child enters the classroom in the morning until the last child goes home. It is the medium of operation in nearly everything that is done throughout the day. The teacher teaches both directly, through the activities and experiences she plans and carries through with the children, and indirectly, through her own speech, language, and behavior.

According to Mildred A. Dawson,[4] the child's every waking hour is devoted to language in one form or another, whether he is in school or not. It is his vehicle of thought and communication. He thinks in words, for the most

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[2] Ibid., pp. 1-2.

[3] Ruth G. Strickland, The Language Arts in the Elementary School (Boston: D. C. Heath and Company, 1951), p. 14.

[4] Mildred A. Dawson, Teaching Language in the Grades (Yonkers-on-the-Hudson: World Book Company, 1951), p. 5.

part; he expresses his ideas in words; he builds up his vicarious experiences as he listens to or reads words. They are indispensable to self-revelation, for it is through speech and writing that he is able to convey to others his bits of information and advice, his viewpoints, his attitudes, and his more articulate feelings and desires. His urge to communicate with others is irrepressible. He desires not only to speak or write his own thoughts, but to listen to, or read, the ideas communicated by others.

To make more valid comparisons of academic attainment at different periods it is necessary to employ the same tests with comparable groups of pupils. There are several studies in which standard educational tests have been used for this purpose. In 1924 Otis W. Caldwell and Stuart A. Courtis published a study in which the attainment of pupils of 1845 was compared with that of pupils who in 1919 took the same tests. The 1919 students rated higher in spelling and on thought questions, but the 1845 students did better on questions requiring rote learning.[5]

In May, 1941, the battery of tests that had been given in 1919 to 6,186 high school seniors in Indiana was

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5 Paul Witty, "Are Children Learning to Read?" School and Society, 75:291, May, 1952.

administered to 2,609 seniors in the Indianapolis high schools. The Research Division of the National Education Association reports the results of the study as follows:

> The 1941 senior class of the Indianapolis Public Schools had a median score which was 15 points higher than the median score attained by the 1919 senior class of Indiana. This is an increase of 11 per cent over the median score attained by 1919 senior class of Indiana. The lowest score of the middle 50 per cent of the 1941 class was only 6 points below the highest score attained by the middle 50 per cent of the 1919 senior class.[6]

In a study made in April, 1947, by Ann Crosby Kline under the supervision of D. A. Worchester of the University of Nebraska, 5,106 pupils in grades three through eight were given the same silent reading test which had been administered to 5,608 pupils of comparable grades in February, 1921. The pupils of 1947 scored significantly higher in rate of reading and in comprehension.[7]

The reading attainment of sixth-grade pupils in 1931 was compared with that achieved on the same tests in 1948 in six Springfield, Missouri schools. There is reasonably

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6 "Comparison of Test Results Attained by High School Seniors in Indiana (1919) and Indianapolis Public High School Seniors (1941)." Reproduced by the Research Division of the National Education Association, 1201 Sixteenth Street, N.W., Washington 6, D.C. [n. d.]

7 Witty, op. cit., p. 292.

good evidence that the teaching of reading in Springfield was much more successful in 1948 than in 1931.[8]

Most studies of reading ability in which the same tests have been employed at different times reveal superiority for present-day pupils.

II. ACHIEVEMENT QUOTIENT

There seem to be many different evaluations of the use of the Achievement Quotient as an effective device in measuring mental and achievement capacities.

There are several formulas for the measurement of achievement in relationship to capacity. Among the names are: Monroe's Achievement Quotient, Franzan's Accomplishment Ratio, Pintner's difference, McCall's F or T difference, McCall's G difference, Torgenson's Efficiency Quotient, Peter's Accomplishment Quotient, Otis Accomplishment Quotient, Symond's Index of Effort, Mygard's Accomplishment Quotient, Rand's Sigma method, subject ratio, optimum level of efficiency and attainment.[9]

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[8] F. H. Finch and V. W. Gillenwater, "Reading Achievement Then and Now," The Elementary School Journal, 49:454, April, 1949.

[9] William Anderson McCall, Measurement (New York: The Macmillan Company, 1939), p. 413.

Lewis M. Terman[10] in discussing this type of measurement says that Doctor Hugh Franzan has made an important contribution in suggesting a practicable method of combining the results of mental and educational tests by the use of the Accomplishment Ratio, previously called the Accomplishment Quotient. He predicted that the Accomplishment Ratio will become widely known and extensively used.

Several workers believed that "scientifically managed schools" would employ the Accomplishment Ratio in judging the worth of a teacher and the efficiency of children's learning.[11]

According to William A. McCall,[12] the Accomplishment Quotient is the most exact present-day measure of the efficiency of the study, instruction, and supervision. It is the only just basis for reporting to parents and for judging pupils, and it is the best index of what pupils need special attention and spurring, of what pupils need restraining perhaps, and of what pupils need to be "let

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10 Lewis M. Terman, and others, Intelligence Tests and School Reorganization (Yonker-on-the-Hudson: World Book Company, 1922), p. 73.

11 Paul Witty and David Koepel, Reading and the Educative Process (Boston: Ginn and Company, 1939), p. 4.

12 William A. McCall, How to Measure in Education (New York: The Macmillan Company, 1923), p. 86.

alone."

It is a common occurrence for pupils of low intelligence to be placed in their chronological group and told to keep up with the class or be publicly stigmatized, officially denied promotion, and corporally punished at home. The A. Q. holds out a promise of much-needed justice. It asks the pupil to progress at a rate which is proportional to the mental capacity with which nature endowed him.

Harry A. Green, in Measurement and Evaluation in the Elementary School,[13] says there is evidence to show that higher Accomplishment Quotients are more commonly obtained in groups of intellectually inferior than by the intellectually superior students. A reason that may contribute to this is that the instructional level of many schools may be geared to the average and below-average which does not stimulate superior pupils. Therefore, an A. Q. far below 100 may indicate poor effort, high I. Q. or both. An A. Q. close to, or more than 100, may indicate unusual effort, low I. Q. or both.

Some educators felt that an A. Q. of 95 is ideal in a school. The goal is to bring these Subject Ratios as high

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[13] Harry A. Greene, and others, Measurement and Evaluation in the Elementary School (New York: Longsman, Green and Company, 1942), p. 240.

as possible. When they are above 90, the child may be considered as receiving satisfactory treatment, providing norms for Subject Ages are reasonably accurate.

That pupil or class which has an A. Q. of 100 has made satisfactory progress. Consistent with health and the need for developing other abilities, the teacher should aim to keep the A. Q. for reading as much above 100 as possible.

A sound conclusion, growing out of the above and other more technical evaluations of the A. Q., seems to be that its use with individual pupils is probably not justified, but that it can be satisfactorily used by groups of pupils.

All things considered, it is probably better to restrict the use of the A. Q. and similar techniques to the measurement of groups, rather than to the measurement of individuals.

III. INTELLIGENCE TESTS

Lloyd G. Humphreys and Paul L. Boynton, in the Encyclopedia of Educational Research[14] in discussing

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14 Walter S. Monroe, Encyclopedia of Educational Research (New York: The Macmillan Company, 1950), pp. 605-606.

intelligence tests, say that if intelligence tests are carefully selected, properly administered, accurately scored, and conservatively interpreted, they may be of tremendous assistance in practical educational activities. They further say, though, that failure to carry out these four conditions can invalidate the results.

Arthur I. Gates[15] reveals that the mental test score or I. Q. or M. A. gives by no means a perfect indication of a child's success in reading. These scores are very useful in understanding children's limitations and needs. They should be used along with many other sources of information about the pupil's make-up. They should not be regarded as telling exactly what to expect of each child.

Paul Witty,[16] Professor of Education at Northwestern University, is of the belief that the intelligence test is an essential item in individual diagnosis. He says that the I. Q. appears to reflect not only mental ability to some extent, but that it reflects experiences, direct and vicarious, to which effective reading ability makes a significant contribution. Witty says that this information

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[15] Arthur I. Gates, The Improvement of Reading (New York: The Macmillan Company, 1947), p. 81.

[16] Witty and Kopel, op. cit., p. 228.

when used in conjunction with data about interests and needs, is valuable in enabling the teacher to select appropriate reading materials so as to make the curriculum more enjoyable. It is pointed out that the mental-test-score is generally conceded to be a good measure of the individual's ability to engage in school work. It is further stated that the I. Q. reveals little about his ability to participate effectively in social situations.[17]

The better so-called intelligence tests can give information about some pupils that is not obtainable otherwise. General intelligence tests are most useful for school age children. The extent to which a child can acquire to a useful degree cultural heritage can be determined rather well by these tests.[18]

IV. ACHIEVEMENT TESTS

A variety of instruments and techniques is employed in measuring school achievement. Much research has been devoted to the evaluation of instruments and procedures for measuring achievement, to the development of techniques of test construction, and to the evaluation of these techniques. The instrument used in measuring achievement for

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17 Ibid., pp. 826-27.

18 Monroe, op. cit., p. 605.

this study was the Metropolitan Achievement Test.

The development of achievement tests is a phase of the scientific movement in education in which may forces and the work of many leaders have contributed.[19]

According to J. Minor Gwynn,[20] excellent standard achievement tests covering the basic subject areas and skills in the elementary schools have been developed. Achievement tests should be used as diagnostic instruments, though they can also be used to discover whether a particular group of children is making progress comparable to the achievements of other groups of children. Gwynn recommends the Metropolitan Achievement Test as an excellent standard achievement test.

In discussing the standardized test, Paul Witty and David Kopel[21] say that the use of these tests is recommended as the most objective and best single means of measuring achievement and of identifying the retarded student. The utility, convenience, and economy of tests for ascertaining the reading status of groups of children are also in favor of the tests.

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19 Ibid., p. 1462.

20 John Minor Gwynn, Curriculum Principles and Social Trends (New York: The Macmillan Company, 1950), p. 300.

21 Witty and Kopel, op. cit., p. 67.

A battery of achievement tests in subjects other than reading may be used to obtain measures of the child's status in the various subject-matter areas. Witty[22] says that these scores frequently permit interesting comparisons with the results of the reading tests.

According to Arthur M. Jordan,[23] achievement-test batteries at the elementary level sample rather well the major outcomes of the more formal aspects of education. Since they are standardized on the same populations, comparisons may be made between standings in the several subjects of instruction. It makes possible the study of levels of achievement of pupils, classes, schools, and school systems. The achievement levels of pupils may be used to group within a class and may be highly suggestive of the types of materials suitable for each child's educational progress. Jordan says that for these reasons achievement-test batteries have become customary in American schools.

Evaluating achievement in learning is a difficult problem, but more progress is being made in that direction

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22 Ibid., p. 239.

23 Arthur M. Jordan, Measurement in Education (New York: McGraw-Hill Book Company, 1953), p. 93.

all the time. Carl Witherington, in his book, Educational Psychology,[24] says that probably no techniques of evaluation can ever be 100 per cent objective or scientific. If such a degree of precision and objectivity cannot be attained, it does not follow that we should cease to work for high efficiency.

William A. McCall summarizes the testing program by saying:

> When intelligently used, tests are merely instruments for realizing the curriculum. Like poison, steam engines, fire, or other potent forces they require intelligent control.[25]

V. SUMMARY

The studies made in the fields of reading, language, grammar, and composition show that the mass of boys and girls in the present-day schools are learning more in these school subjects than did the smaller number of pupils in school thirty to seventy years ago.

There is a rather limited amount of materials or studies dealing with the mental ability and the Language Art achievement capacity of the upper grade elementary

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[24] Henry Carl Witherington, Educational Psychology (Boston: Ginn and Company, 1946), p. 323.

[25] William Anderson McCall, Measurement (New York: The Macmillan Company, 1939), p. 406.

school student.

One of the devices used was the Achievement Quotient. There seems to be many different evaluations of the use of the Achievement Quotient as an effective device in measuring mental and achievement capacities. The consensus of the educators seems to be that its use with individual pupils is probably not justified, but that it can be satisfactorily used by groups of pupils. All things considered, it is probably better to restrict the use of the Achievement Quotient and other similar techniques to the measurement of groups, rather than the measurement of individuals.

Evaluating achievement in learning is a difficult problem, but progress is being made in that direction all the time. No technique of evaluation can ever be 100 per cent objective or scientific. If such a degree of precision or objectivity cannot be attained, it does not follow that we should cease to work for high efficiency.

Tests constitute probably the major type of evaluative instruments, but many other factors have a significant place in the evaluation of pupil behavior and achievement.

CHAPTER III

PRESENTATION AND INTERPRETATION OF TEST DATA

In order to measure the ability and achievement in Language Arts of eighth-grade students in San Joaquin County, the test results of the San Joaquin County Superintendent's Office were used. Three hundred and twelve eighth-grade students of twenty-one county elementary schools, tested during the month of April, 1953, were used in this study.

The Metropolitan Achievement Test, Form S, and the Otis Quick-Scoring Mental Ability Test, Beta Test, Form B, were used. The students used were from schools of under four hundred average daily attendance.

San Joaquin County testing program. The purpose of the county testing program is to aid the teacher in understanding the child, and in planning a curriculum to fit the individual need and capacity of each child.

The minimum testing program required in all elementary schools consists of achievement tests in grades three through eight, and mental ability tests in grades five and eight. Mental tests are given in the fall and achievement tests in the spring.

Metropolitan Achievement Tests. The Metropolitan Achievement Tests series is a comprehensive series of educational achievement tests consisting of five batteries covering the essential skill subjects and content areas taught in grades one to nine. Each battery consists of a group of different tests which were subject to the same experimental verification and were standardized at the same time, on the same pupil population. The several forms of each battery are similar in content and organization and equal in difficulty.

Otis Quick-Scoring Mental Ability Tests. The rate at which instruction can be absorbed is determined by pupil capacity to learn, which is measured most successfully by a sound intelligence test. Before judgment is passed on individual or group accomplishment, it is necessary to know with some degree of exactness the quality of pupil ability in the group.

The Otis Quick-Scoring Mental Ability Test is a series of problems to which the child is exposed under standard and controlled situations. These are problem situations to which the child's total experience, including home, movies, radio, libraries, etc., may contribute, in contrast to his specific school experience. The test is designed to reveal the Intelligence Quotient in line with

established norms for the test.

The Metropolitan and Otis Tests are both published by the World Book Company.

Construction of the tables. The Comprehensive Reading, Vocabulary, Spelling, and English results of the three hundred twelve eighth-grade students were examined and suitable preliminary tables were constructed to best suit this study. Form two was used to tabulate the results.

Computation and tabulation of the data. When the tables were constructed, the information was tabulated and organized.

Interpreting the results. The results of this study are interpreted by studying the tables and graphs and making the necessary explanations relative to the presentation of the data.

The Accomplishment Quotient of the four areas tested as indicated in Table I are as follows:

Reading Comprehension	99.60
Vocabulary	99.11
Spelling	99.47
English	96.43
Total Language Arts	98.86

TABLE I

ACHIEVEMENT QUOTIENT OF THREE HUNDRED TWELVE SELECTED ELEMENTARY STUDENTS IN SAN JOAQUIN COUNTY, APRIL, 1953

Subject	Accomplishment Quotient
Reading Comprehension	99.60
Vocabulary	99.11
Spelling	99.47
English	96.43
Total Language Art	98.86

Some educators felt that an A. Q. of 95 or more is most ideal in a school. The goal is to bring the A. Q. as high as possible. The class or pupil which has an A. Q. of 100 or close to 100 has made satisfactory progress. With this in mind the Accomplishment Quotient results obtained in this survey show that the eighth-grade students in San Joaquin County Schools are working up to their ability and that much of the criticism of our schools is not justified.

As shown in Table I, page 27, Reading Comprehension had the highest A. Q. with 99.60, and English the lowest A. Q. with 96.43.

Distribution of Reading scores. In the distribution of the Reading scores (Figure 1) the mean for the three hundred twelve students was 8.56 grade. The median was 7.87 grade. The lowest score was 2.5 grade, made by one student, and the highest score on the test, 11.5 grade, was made by fifty students.

Distribution of Vocabulary scores. In the distribution of the Vocabulary scores (Figure 2, page 30) the mean for the three hundred twelve students was 8.0 grade. The median was 8.1 grade. The lowest score was 2.5 grade, made by two students, and the highest score on the test, 11.5 grade, was made by fifty-two students.

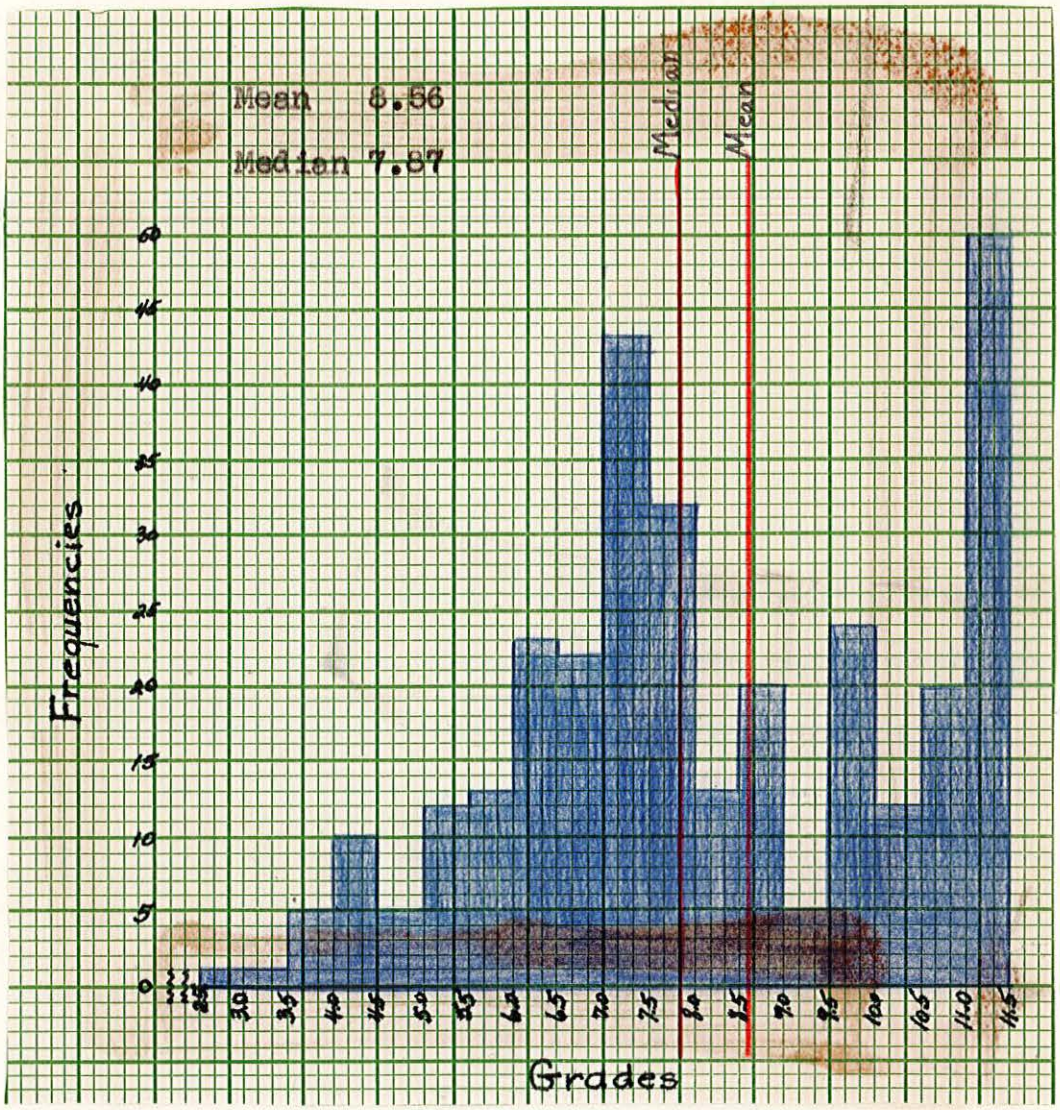

FIGURE 1

READING GRADES OF 312 EIGHTH-GRADE STUDENTS ON THE METROPOLITAN ACHIEVEMENT TEST, FORM S

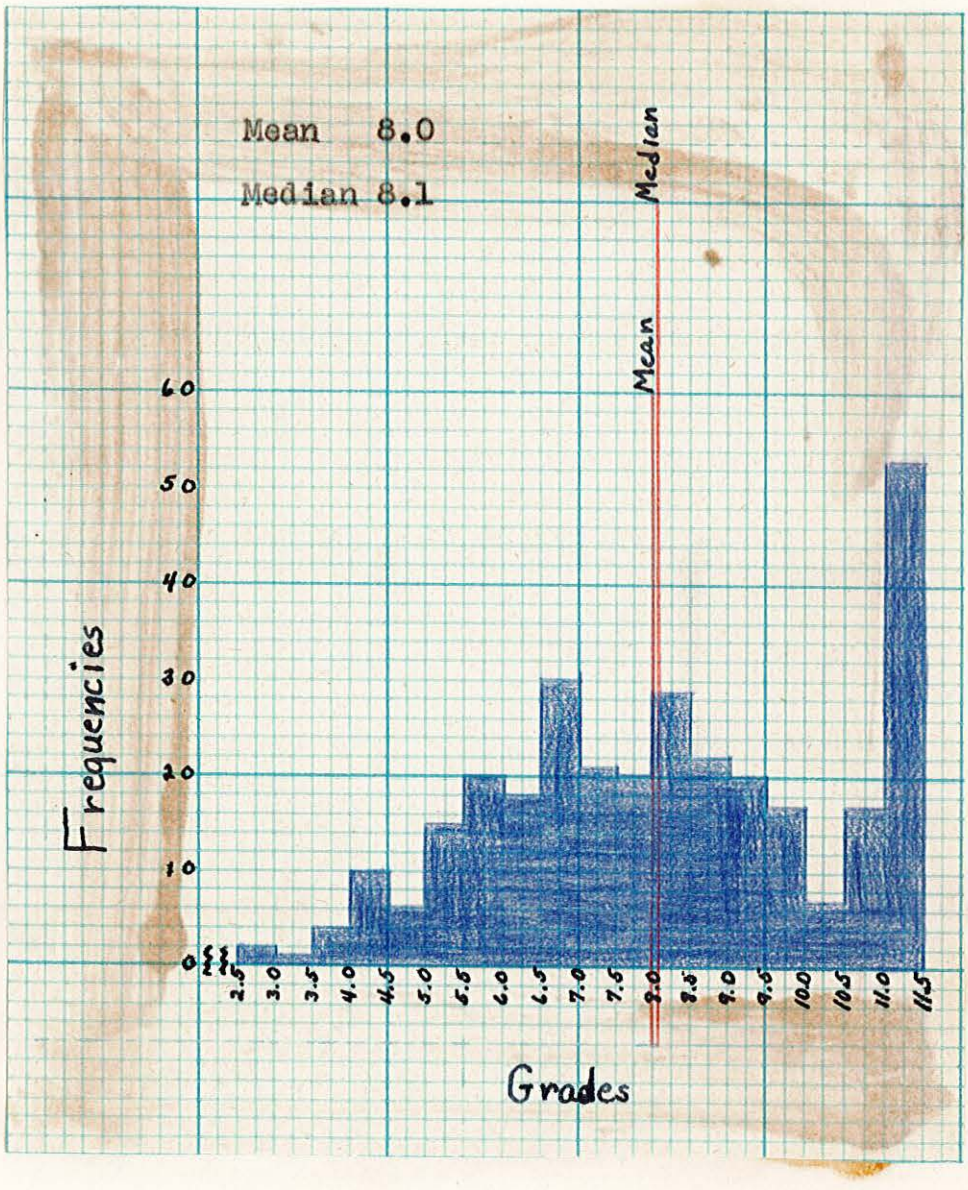

FIGURE 2

VOCABULARY GRADES OF 312 EIGHTH-GRADE STUDENTS ON THE METROPOLITAN ACHIEVEMENT TEST, FORM S

Distribution of Spelling scores. In the distribution of the Spelling scores (Figure 3), the mean for the three hundred twelve students was 8.05 grade. The median was 8.01 grade. The lowest score was 2.0 grade, made by one student, and the highest score on the test, 11.5 grade, was made by forty-four students.

Distribution of English scores. In the distribution of the English scores (Figure 4, page 33), the mean for the three hundred twelve students was 7.77 grade. The median was 7.65 grade. The lowest score was 2.0 grade made by one student, and the highest score on the test, 11.5 grade, was made by twenty-five students.

Distribution of average Language Arts scores. In the distribution of the average Language Arts scores (Figure 5, page 34), the mean for the three hundred twelve students was 8.15 grade. The median was 7.90 grade. The lowest score was 2.5 grade made by one student, and the highest score on the test, 11.5 grade, was made by eighteen students.

Distribution of Mental Ages. In the distribution of the Mental Ages (Figure 6, page 35), the mean for the three hundred twelve students was 12 years 8.7 months. The median was 12 years 9.5 months. The lowest mental age was

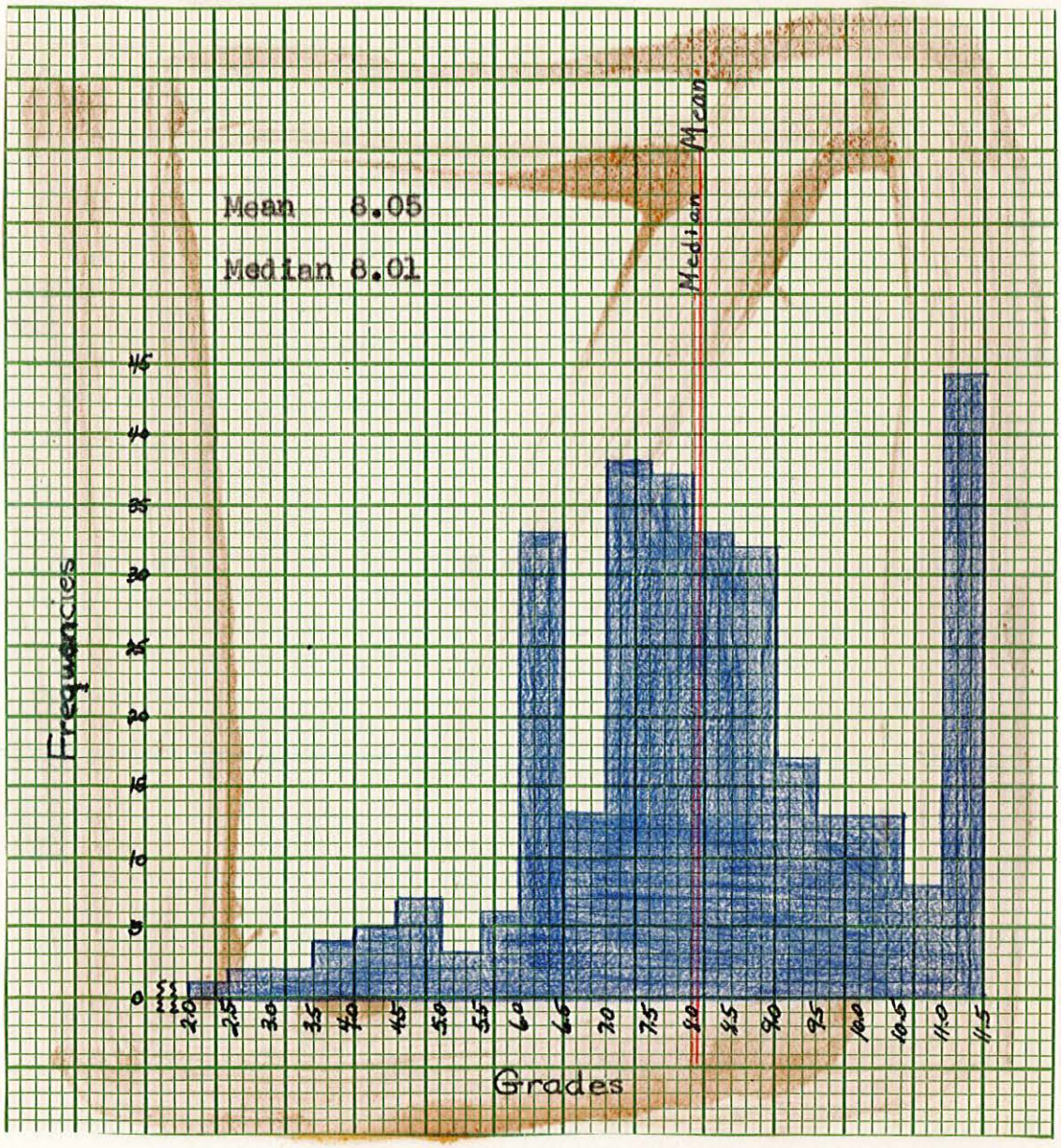

FIGURE 3

SPELLING GRADES OF 312 EIGHTH-GRADE STUDENTS ON THE METROPOLITAN ACHIEVEMENT TEST, FORM S

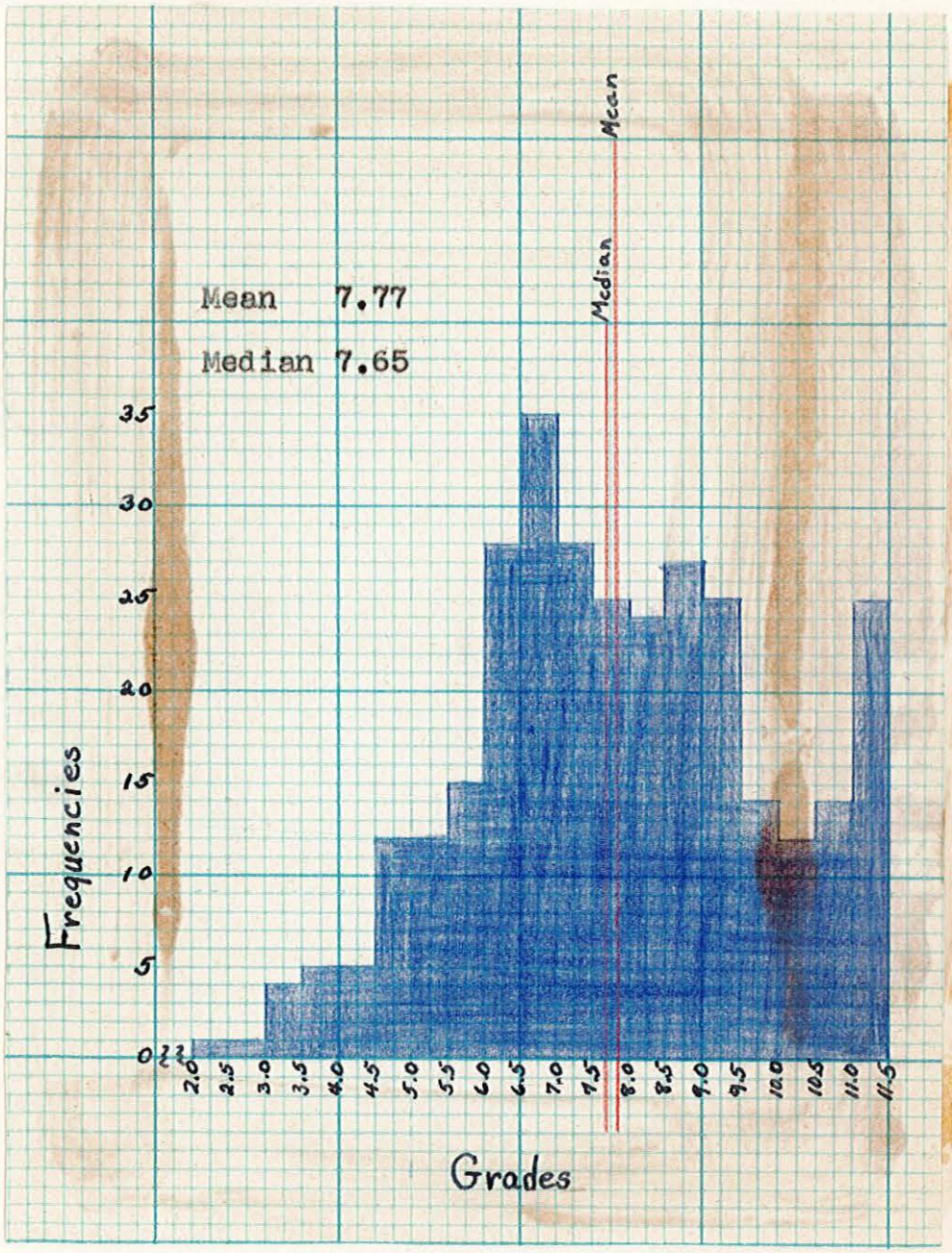

FIGURE 4

ENGLISH GRADES OF 312 EIGHTH-GRADE STUDENTS ON THE METROPOLITAN ACHIEVEMENT TEST, FORM S

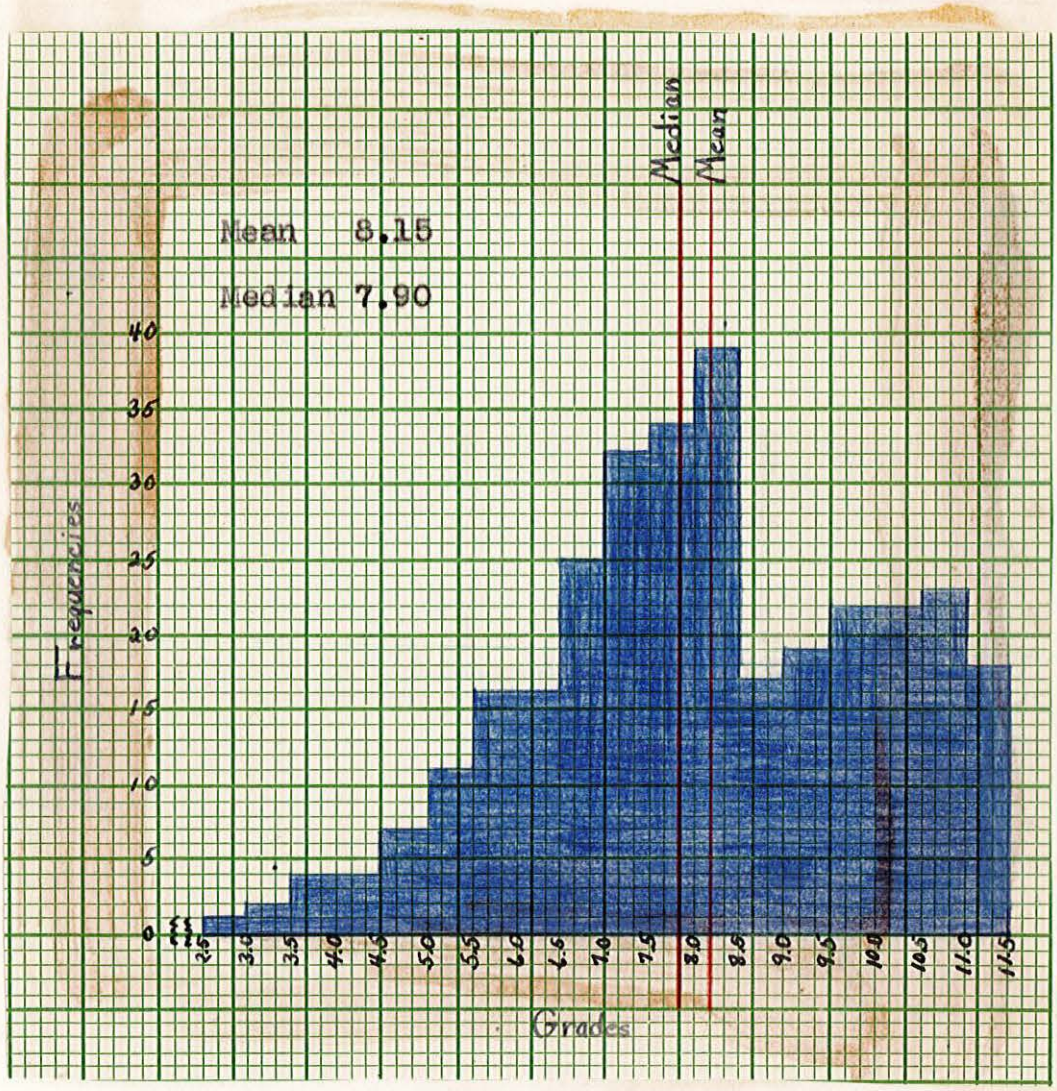

FIGURE 5

AVERAGE LANGUAGE ARTS GRADES OF 312 EIGHTH-GRADE STUDENTS ON THE METROPOLITAN ACHIEVEMENT TEST, FORM S

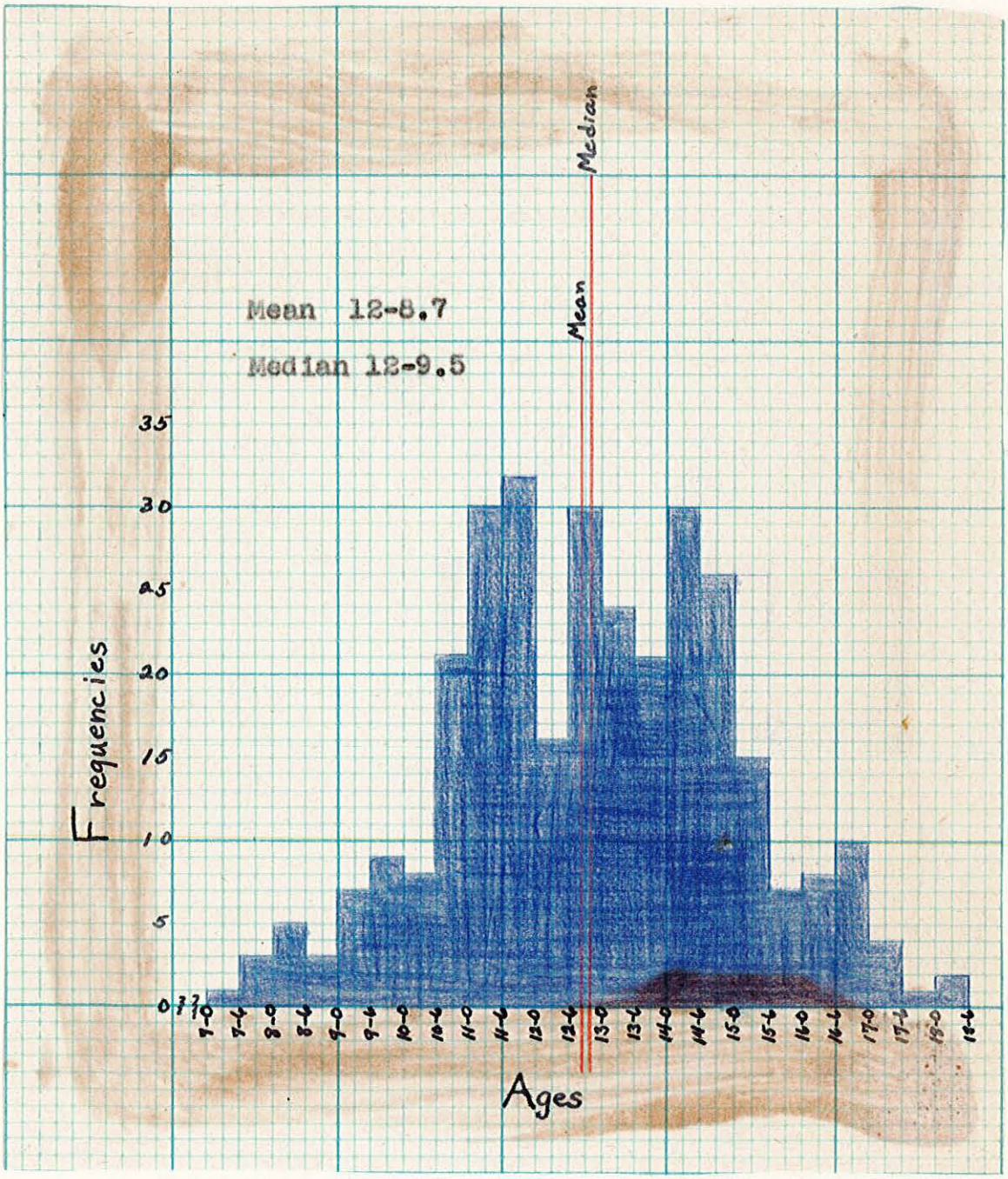

FIGURE 6

MENTAL AGES OF 312 EIGHTH-GRADE STUDENTS ON THE METROPOLITAN ACHIEVEMENT TEST, FORM S

7.0 years possessed by one student, and the highest mental age was 18 years 2 months, possessed by two students.

Distribution of Chronological Ages. In the distribution of the Chronological Ages (Figure 7, page 37), the mean for the three hundred twelve students was 13 years 10.1 months. The median was 13 years 10.8 months. The lowest Chronological age was 12 years 6 months possessed by three students, and the highest Chronological Age was 16.0 years possessed by three students.

Distribution of Intelligent Quotients. In the distribution of the Intelligent Quotients (Figure 8, page 38), the mean of the three hundred twelve students was 97.24. The median was 97.75. The lowest Intelligent Quotient was 45 possessed by one student, and the highest Intelligent Quotient was 135 possessed by four students.

Summary. The results of this study are interpreted by studying the Tables and Figures and making the necessary explanations relative to the presentation of the data.

Some educators felt that an A. Q. of 95 or more is most ideal in a school. The goal is to bring the A. Q. as high as possible. The class or pupil which has an A. Q. of 100 or close to 100 has made satisfactory progress. With this in mind the Accomplishment Quotient results obtained

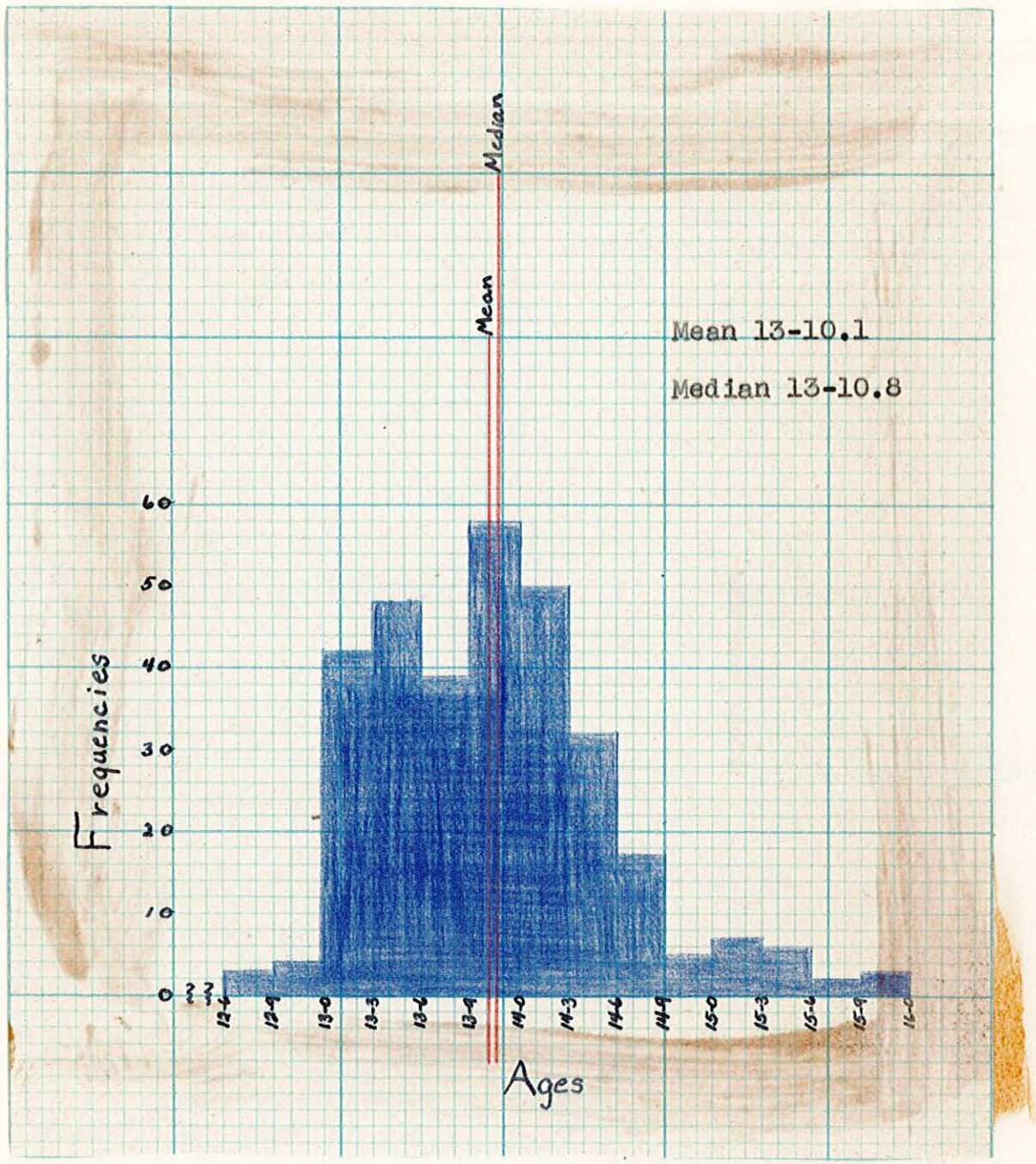

FIGURE 7

CHRONOLOGICAL AGES OF 312 EIGHTH-GRADE STUDENTS ON THE METROPOLITAN ACHIEVEMENT TEST, FORM S

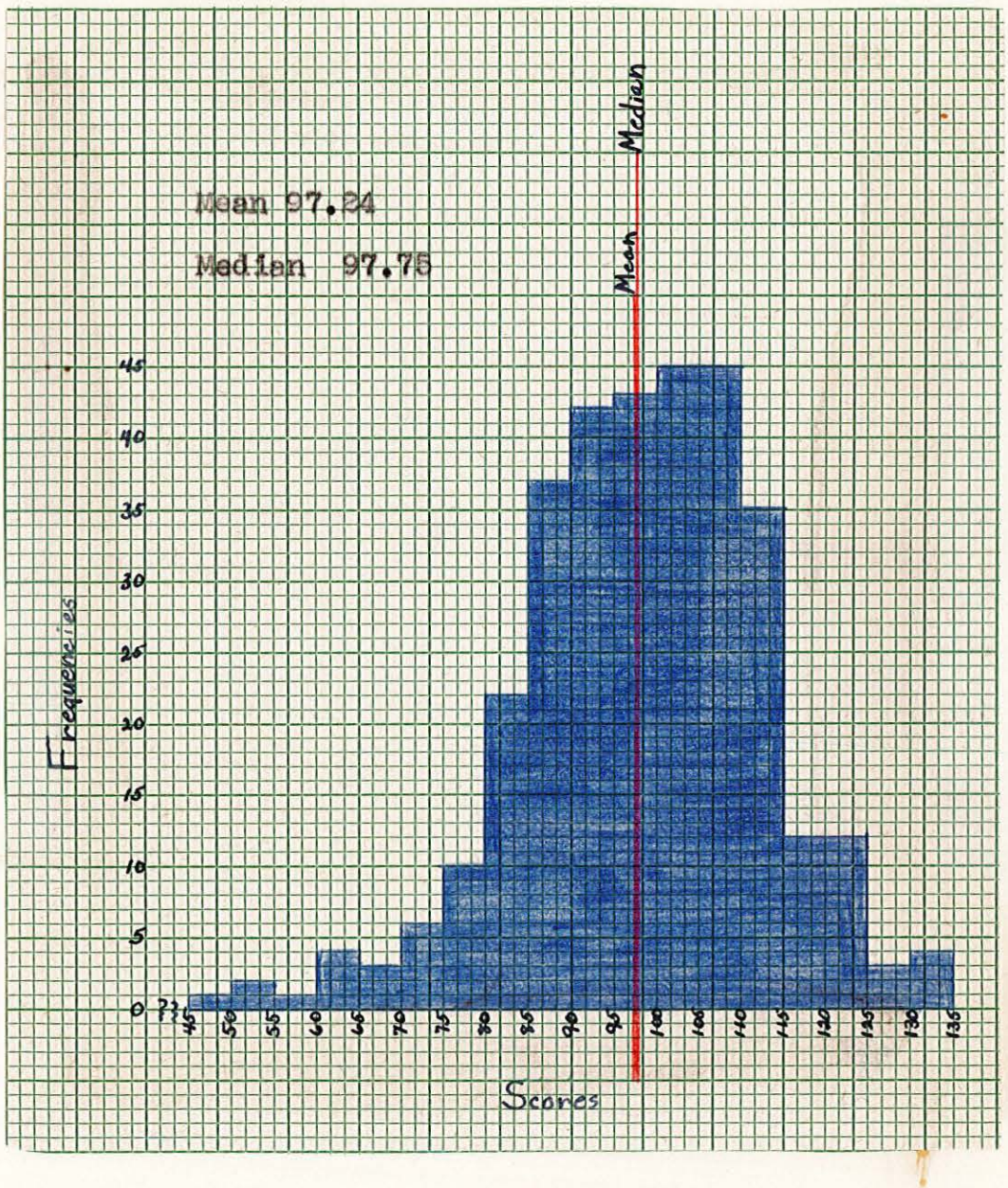

FIGURE 8

INTELLIGENT QUOTIENT OF 312 EIGHTH-GRADE STUDENTS ON THE OTIS QUICK-SCORING MENTAL ABILITY TEST, BETA B

in this survey show that the eighth-grade students in San Joaquin County Schools are working up to their ability in Language Arts and that much of the criticism of our schools is not justified.

Reading Comprehension had the highest A. Q. with 99.60 and Vocabulary was next with 99.11. Spelling was next with 99.47, and English had the lowest A. Q. with 96.43. The A. Q. of the total Language Arts was 98.86.

CHAPTER IV

COMPARISON WITH LOCAL, STATE, REGIONAL, AND NATIONAL NORMS

Local studies. According to McDow,[1] the observation had been made that comprehension in reading was not all that it should be when the elementary pupil entered the eighth-grade course of study. A survey of five hundred forty-seven pupils about to enter the eighth grade at the Stockton High School indicated that, of that number, 21 per cent were reading at a grade level less than five years seven months.

In the distribution of the reading scores in this survey it showed that of the three hundred twelve pupils at the 8.8 grade level, 15 per cent were reading at a grade level less than six years.

Fong[2] in his study showing the relationship between educational development and relative brightness of one hundred seventy-five eighth-grade students found that the

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[1] Marvin McDow, "A Plan for English Grade Reading Improvement," (unpublished Master's thesis, the College of the Pacific, Stockton, 1950), p. 2.

[2] Don Fong, "A Study of the Relationship Between Student Educational Level and Mental Maturity in Seventeen County Schools," (unpublished paper, San Joaquin County Superintendent of Schools Research Department, June 1950), p. 1.

mean I. Q. was 98. The mean I. Q. of the three hundred twelve eighth graders used in this survey was 97.24.

Further on in his study, Fong[3] states that the A. Q. could be used singularly to show the relationship of a student's mental ability to his achievement in a certain subject, or it could be used as a collective figure to show the relationship of the average mental ability of all the students to their average achievement in all the subject matter. The obtained A. Q. in his study was 98. The A. Q. in this survey of the three hundred twelve eighth-grade students used was 98.86.

The average M. A. of one hundred seventy-five eighth-grade students used in Fong's study was 12 years 9 months. The average M. A. obtained in this study was 12 years 8.7 months.

State studies. There has been a limited amount of research done on this subject at the state level.

The Research Office of the Long Beach Unified School District[4] wanted to provide local norms on the Otis Beta

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[3] Ibid., p. 3.

[4] California Teachers' Association Research Bulletin, "An Annotated Classified Bibliography of Research Studies of California City and County School Districts Research Department, 1946 to 1949, Bulletin Number 15," September, 1949, p. 56.

Quick-Scoring Mental Ability Test. After testing 2,286 seventh-grade students the range of I. Q.'s was found to be from less than 60 to more than 135. The mean I. Q. was 101.6.

The mean I. Q. of the three hundred twelve eighth-grade students tested for this survey was 97.24. The range of I. Q.'s was from less than 50 to more than 130.

According to a letter from the Division of Test Research and Service, World Book Company,[5] the Accomplishment Quotient on the Metropolitan Achievement Tests should be more meaningful than similar quotients for other tests, since the Metropolitan Achievement Test age equivalents are based upon all students in school regardless of grade placement, and are corrected for students of school age but not in school. The Language Age will be more directly comparable with the Mental Age than age equivalents from other instruments.

Regional norms. In the establishing of national norms for the Metropolitan Achievement Test, the Ninth

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5 See Appendix, p. 60.

Geographic Region was composed of the states of California, Oregon, and Washington.

At the 8.2 grade level the mean I. Q. (Table III, page 45) was 102.9. The mean I. Q. of the three hundred twelve eighth-grade students tested at the 8.8 grade level was 97.24.

The mean reading score (Table III, page 45) made at the 8.2 grade level in the Ninth Geographic Region was 8.3 grade. The mean reading score made by the three hundred twelve eighth-grade students at the 8.8 grade level was 8.56 grade, the highest score achieved by the group in this survey.

The mean vocabulary score (Table III, page 45) achieved by the Ninth Geographic Region students was 8.5 grade. This was the highest score obtained by this group. The mean vocabulary score of the three hundred twelve eighth-grade students used in this survey was 8.0.

The lowest scores made by either group were in English (Table III). The Ninth Geographic Region mean English score was 7.8, while the mean score of the three hundred twelve eighth-grade students used in this survey was 7.77 grade.

The mean spelling score (Table III) obtained by the Ninth Geographic Region students was 8.3 grade. The mean spelling score made by the three hundred twelve eighth-grade

TABLE II

METROPOLITAN ACHIEVEMENT TESTS: ADVANCED BATTERY*

Subject	Grade 8 SS	Grade 8 GE	Grade 9 SS	Grade 9 GE
1. Reading	217	8.3	222	8.8
2. Vocabulary	219	8.5	227	9.4
3. Arithmetic Fundamentals	240	8.0	251	8.6
4. Arithmetic Problems or Numbers	221	8.1	230	9.0
5. English I, II	215	7.8	224	8.9
English I, II, III	220	8.0	230	9.1
6. Literature	216	8.2	219	8.6
7. History	214	8.1	221	9.0
8. Geography	217	8.6	225	9.9
9. Science	224	8.5	233	9.3
10. Spelling	227	8.3	235	8.9
National Grade Norm		8.2		9.2
Mean PGAT IQ	102.9		102.3	
National Mean PGAT IQ	96.5		99.2	

* National Grade Equivalent corresponding to the mean standard score made in the Ninth Geographic Region, States of California, Oregon, and Washington.

TABLE III

METROPOLITAN ACHIEVEMENT TESTS

Subject	Grade*	Grade**
Reading	8.3	8.56
Vocabulary	8.5	8.0
English	7.8	7.77
Spelling	8.3	8.05
Mean I. Q.	102.9	97.24

* National Grade Equivalent corresponding to the mean standard score made in the Ninth Geographic Region: States of California, Oregon, and Washington--8.2 grade level.

** Grade Equivalent of three hundred twelve San Joaquin County eighth-grade students tested at 8.8 grade level.

students used in this survey was 8.05 grade.

An over-all comparison of scores made by the Ninth Geographic Region students and the students used in this survey seems to indicate that the Ninth Geographic Region students had made more progress than the local students; although it should be pointed out that there is a 5.66 higher I. Q. possessed by the Ninth Geographic Region.

National norms. National norms on an achievement test should never be considered as standards of accomplishment or goals to be reached by an individual, school, or community without due considerations of other factors. The general administrative policies, along with the range and average level of intelligence, will determine how closely a community may be expected to come to the national norms. Because a child has received a score below the national norm, he should not be designated a failure, for actually he may be achieving up to his own expected level of achievement.

At the 8.8 grade level on the national norm, the mean score for the four phases of Language Arts of students tested by the Metropolitan Achievement Tests, Form S, is 8.8 grade. The mean Language Arts scores, at the 8.8 grade level, made by the three hundred twelve eighth-grade students used in this survey are as follows:

Reading Comprehension	8.56
Vocabulary	8.0
Spelling	8.05
English	7.77
Total Language Arts	8.15

At the 8.8 grade level on the national norm the mean I. Q. of students tested by the Otis Quick-Scoring Mental Ability Test, Beta Test, Form B, is 100. The mean I. Q. of the three hundred twelve eighth-grade students tested at the 8.8 grade level by the Otis Quick-Scoring Mental Ability Test, Beta Test, Form B, was 97.24.

Summary. Norms on an achievement test never should be considered as standards of accomplishment or goals to be reached by an individual, school, or community without due considerations of other factors. The general administrative policies along with range and average level of intelligence will determine how closely a community may be expected to come to the local, state, regional, or national norm. Because a child has received a score below the local, state, regional, or national norm, he should not be designated a failure, for actually he may be achieving up to his own expected level of achievement.

At the 8.8 grade level on the national norm the mean score for the four phases of Language Arts of students

tested by the Metropolitan Achievement Test, Form S, is .65 grade level higher than the mean Leanguage Arts score made by the three hundred twelve eighth-grade students used in this survey.

Also, at the 8.8 grade level on the national norm the mean I. Q. of students tested by the Otis Quick-Scoring Mental Ability Test, Beta Test, Form B, is 2.76 points higher than the mean I. Q. of the three hundred twelve eighth-grade students used in this survey.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

I. SUMMARY

In spite of over-crowded classrooms, migrant population, and inadequate housing, the teachers of San Joaquin County Elementary Schools have done an adequate job in developing the Language Arts program.

On paper, some of these students look as if they were not functioning in communicative arts, but teacher and employer observation reveal that many of the youngsters function higher than the test would indicate. There are many reasons for inadequate results on the tests, such as various backgrounds, social-economic level, bi-lingual background and emotional problems of the time. The very fact that the test is verbal is an indication that it would not show the student's actual performance in a situation.

If the average pupil achievement (E. A.) is in keeping with his ability to learn (M. A.), his A. Q. will be 100. Obviously, the indication of an A. Q. below 100 means that the pupils are not working to capacity, and the A. Q. of more than 100 means that the pupils are working above capacity.

This study indicated that the three hundred twelve eighth-grade students from twenty-one schools are achieving up to expectation because no average student could achieve more than 100 per cent of his capacity, so that obtained A. Q.'s of from 96.43 to 99.60 are very good. Some educators felt that an A. Q. of 95 is most ideal in a school. An A. Q. of more than 100 means that the students are being taxed to the limits of their abilities. This will not promote a well-balanced program in other areas of learning. However, an A. Q. of more than 100 is not uncommon in a highly motivated instructional drive within a single subject field.

There is some evidence in the study that higher A. Q.'s are more commonly obtained in groups of intellectually inferior than by the intellectually superior pupils. A reason that may contribute to this is that the instructional level of many schools may be geared to the average and below-average pupil, which does not stimulate superior pupils. Therefore, an A. Q. far below 100 may indicate poor effort, high I. Q., or both. An A. Q. close to, or more than 100, may indicate unusual effort, low I. Q., or both.

II. CONCLUSIONS

The conclusions of this study are presented below:

1. The Achievement Quotient used as a measurement to show the relationship between Language Arts development and relative brightness of the students left much to be desired. A better method of obtaining a quotient between educational test scores and Mental Ages is needed.

2. Other studies directly related to this investigation were either not found or were obscure, indicating that further research should be made in this area of study.

3. As far as this study is concerned in using the Achievement Quotient to find whether the eighth-grade students were working up to their ability in Language Arts, it is indicated that the students are achieving up to expectation.

4. The testing program is a guide and is only one of many guides that a teacher may use in evaluating a youngster's development.

III. RECOMMENDATIONS

The recommendations from this study of whether the eighth-grade students of the San Joaquin Elementary Schools are working up to their ability in Language Arts are

presented below:

1. It is recommended that there should be extensive studies to set up city, county, state, and regional norms for the various achievement and intelligence test used.

2. It is recommended that a study should be conducted to make available more data that will permit conversion of scores or I. Q.'s derived from one test to comparable measures derived from other tests.

3. It is recommended that a study be made to find a better method of obtaining a quotient to show the relationship between educational test scores and Mental Ages.

4. It is recommended that similar studies be made in other California counties for a comparative analysis.

BIBLIOGRAPHY

BIBLIOGRAPHY

A. BOOKS

Dawson, Mildred Agnes, Teaching Language in the Grades. Yonkers-on-Hudson, New York: World Book Company, 1951. 341 pp.

Gates, Arthur I., The Improvement of Reading. New York: The Macmillan Company, 1947. 657 pp.

Good, Carter V., Dictionary of Education. New York: McGraw-Hill Book Company, Inc., 1945. 495 pp.

Greene, Harry A., Albert N. Jorgensen, and J. Raymond Gerberich, Measurement and Evaluation in the Elementary School. New York: Longsman, Green and Company, 1942. 639 pp.

Gwynn, John Minor, Curriculum Principles and Social Trends. New York: The Macmillan Company, 1950. 768 pp.

Jordan, Arthur M., Measurement in Education. New York: McGraw-Hill Book Company, Inc., 1953. 533 pp.

McCall, William Anderson, How To Measure in Education. New York: The Macmillan Company, 1923. 416 pp.

_____, Measurement. New York: The Macmillan Company, 1939. 535 pp.

Strickland, Rugh G., The Language Arts in the Elementary School. Boston: D. C. Heath and Company, 1951. 370 pp.

Terman, Lewis M., and others, Intelligence Tests and School Reorganization. Yonkers-on-Hudson, New York: World Book Company, 1922. 111 pp.

Witherington, Harry Carl, Educational Psychology. Boston: Ginn and Company, 1946. 464 pp.

Witty, Paul, and David Kopel, Reading and the Educative Process. Boston: Ginn and Company, 1939. 374 pp.

B. PERIODICAL ARTICLES

Finch, F. H., and V. W. Gillenwater, "Reading Achievement Then and Now," The Elementary School Journal, 49: 446-54, April, 1949.

Kaplan, Louis, "The Attack on Modern Education," The Phi Delta Kappa, 32:223-26.

Witty, Paul, "Are Children Learning to Read?" School and Society, 75:289-94, May, 1952.

Witty, Paul, and Ann Coomer, "How Successful is Reading Instruction," Elementary English, 28:451-57, December, 1951.

C. PUBLICATIONS OF LEARNED ORGANIZATIONS

"Comparison of Test Results Attained by High School Seniors in Indiana (1919) and Indianapolis Public High School Seniors (1941)," Reproduced by the Research Division of the National Education Association, 1201 Sixteenth Street, N.W., Washington 6, D. C., /n. d./

Dawson, Mildred, "Teaching Language in the Elementary School," Forty-Third Yearbook of the National Society for the Study of Education, Part II. Chicago: University of Chicago, Department of Education, 1944. Pp. 110-17.

D. UNPUBLISHED MATERIALS

California Teacher's Association Research Bulletin, "An Annotated Classified Bibliography of Research Studies of California City and County Schools Districts, Research Department, 1946 to 1949, Bulletin Number 15," September, 1949. 56 pp.

Fong, Don, "A Study of the Relationship Between Educational Level and Mental Maturity in Seventeen County Schools." Unpublished paper, the San Joaquin County Superintendent of Schools Research Department, June, 1950. 3 pp.

McDow, Marvin, "A Plan for English Grade Reading Improvement." Unpublished Master's thesis, the College of the Pacific, Stockton, 1950. 122 pp.

APPENDIX A

Name_____ School_____

Metropolitan Achievement Test-Form S Date Given_____

Age at Date of Test_____Years_____Months = C.A._____Months

Reading

____R.A. on test
____adj. diff. in test dates
____adjusted R.A.
+5.5 years not in school
____total R.A. x 12 months = ____mos.

8 years in school = _____
av. gain per year = _____
____mos. diff. in test dates = _____
A.Q. = R.A. / M.A. = _____ = _____

Vocabulary

____V.A. on test
____adj. diff. in test dates
____adjusted V.A.
+5.5 years not in school
____total V.A. x 12 months = ____mos.

8 years in school = _____
av. gain per year = _____
____mos. diff. in test dates = _____
A.Q. = R.A. / M.A. = _____ = _____

Spelling

____S.A. on test
____adj. diff. in test dates
____adjusted S.A.
+5.5 years not in school
____total S.A. x 12 months = ____mos.

8 years in school = _____
av. gain per year = _____
____mos. diff. in test dates = _____
A.Q. = S.A. / M.A. = _____ = _____

English

____E.A. on test
____adj. diff. in test dates
____adjusted E.A.
+5.5 years not in school
____total E.A. x 12 months = ____mos.

8 years in school = _____
av. gain per year = _____
____mos. diff. in test dates = _____
A.Q. = E.A. / M.A. = _____ = _____

Total Language Arts

____R.A.
____V.A.
____S.A.
____E.A.
4 _____ Total L.A.
_____ Av. L.A.

____Av. L.A.
____adj. diff. in test dates
____adjusted L.A.
+5.5 years not in school
____total L.A. x 12 mos. = ____mos.

8 years in school = ___
av. gain per year = ___
____mos. diff. in test dates = ___
A.Q. = L.A. / M.A. = ____ = ___

Otis Quick Scoring Test Date Given _____

M.A. = _____ x 12 months = _____mos.

I.Q. = _____

TOTAL SHEET

Name _____ School _____
Metropolitan Achievement Test-Form S Date Given _____
Age at Date of Test _____ Years _____ Months = C.A. _____ Months

Reading

____R.A. on test
____adj. diff. in test dates
____adjusted R.A.
+5.5 years not in school
____total R.A. x 12 months = ____mos.

8 years in school = _____
av. gain per year = _____
____mos. diff. in test dates = _____
A.Q. = R.A./M.A. = 48,142/48,333 = 99.60

Vocabulary

____V.A. on test
____adj. diff. in test dates
____adjusted V.A.
+5.5 years not in school
____total V.A. x 12 months = ____mos.

8 years in school = _____
av. gain per year = _____
____mos. diff. in test dates = _____
A.Q. = R.A./M.A. = 47,901/48,333 = 99.11

Spelling

____S.A. on test
____adj. diff. in test dates
____adjusted S.A.
+5.5 years not in school
____total S.A. x 12 months = ____mos.

8 years in school = _____
av. gain per year = _____
____mos. diff. in test dates = _____
A.Q. = S.A./M.A. = 48,075/48,333 = 99.47

____E.A. on test
____adj. diff. in test dates
____adjusted E.A.
+5.5 years not in school
____total E.A. x 12 months = ____mos.

8 years in school = _____
av. gain per year = _____
____mos. diff. in test dates = _____
A.Q. = E.A./M.A. = 46,607/48,333 = 96.43

Total Language Arts

____R.A.
____V.A.
____S.A.
____E.A.
4 _____ Total L.A.

_____ Av. L.A.

____Av. L.A.
____adj. diff. in test dates
____adjusted L.A.
+5.5 years not in school
____total L.A. x 12 mos. = ____mos.

8 years in school = ___
av. gain per year = ___
____mos. diff. in test dates = ___
A.Q. = L.A./M.A. = 47,783/48,333 = 98.86

Otis Quick Scoring Test Date Given _____
M.A. = _____ x 12 months = 48,333 mos.
I.Q. = _____

APPENDIX B

WORLD BOOK COMPANY, PUBLISHERS

Division of Test Research and Service
Yonkers-on-Hudson 5, New York
19 August 1953

Mr. Hamilton Hodgson
Consultant in Elementary Education
County of San Joaquin
Division of Education
336 East Market Street
Stockton 8, California

Dear Mr. Hodgson:

Your letter of 12 August has been referred to the Division of Test Research and Service.

We do not have special California norms on the Metropolitan. Since mental age, IQ or other state norms on a mental ability test would be of questionable value, I assume that you are attempting to get some means of establishing common reference points for evaluating status in the Language Arts as measured by the MAT, with potentialities for achievement as measured by the Otis.

Under separate cover I am sending you a copy of the Metropolitan Achievement Test Manual for Interpreting which describes in considerable detail the procedure followed in developing the MAT. I am also sending you a copy of the MAT Booklet of Norms, Sections I, II, and III. In Section I you will find a list of the Pacific Coast communities that participated in the standardization program. The enclosed table summarizes some of the significant data for this population. Although the Pintner General Ability Tests were used, you can convert the PGAT data to its Otis equivalent by use of the enclosed Test Service Notebook No. 11.

You may find these data will supplement your use of the accomplishment quotient which has not proven as fruitful as might be desired. However, the accomplishment quotient on the MAT should be more meaningful than similar quotients for other tests, since the MAT age equivalents are based upon all students in school regardless of grade placement, and are corrected for students of school age but not in school. Thus, the language age will be more directly comparable with the mental age than age equivalents from

other instruments. Of course, you will obtain the language quotient by dividing each student's language age equivalent by his mental age.

Instead of merely comparing the average achievement with the average mental ability of the San Joaquin County pupils, you will probably find it quite helpful to evaluate the relative effectiveness of the above average, average, and below average pupils. A simple way of doing this would be to compare the percentage of the pupils in each of three or five levels on the mental ability test with the percentage in the corresponding levels on the achievement test. For this purpose, of course, the levels would have to be established in terms of national or Pacific Coast data. For example, if you used the national levels based upon the standard deviation, you would expect 7% to be in "Level I: Very high" if your county schools are typical of the national population. If you found 15% in Level I on the mental ability test and 7% in Level I on the achievement test, you would conclude that, as compared with the typical pupils in the nation, the San Joaquin County pupils do not have as large a proportion achieving at a superior level as one would expect in terms of the population at the very superior level of mental ability. You would, of course, want to test the differences for statistical significance, and point out that this simple procedure does not make allowances for the regression tendency.

Since you are so far along in writing your thesis, I hesitate to make extensive suggestions. When you get ready to start your work on your doctoral dissertation you might be interested in using some techniques which we have developed for evaluating achievement in terms of potentialities for achievement. However, these would call for considerable statistical treatment and are more appropriate for a doctoral thesis than for a master's thesis.

We trust that the above information will prove helpful. If we can be of further assistance, please do not hesitate to call upon us.

Sincerely yours

Claude F. Bridges /s/
Division of Test Research
and Service
Claude F. Bridges

CFB:AB
Encs.