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A comparative mental-educational and music survey of the seventh and eighth grades of Deming School, Terre Haute, Indiana, in April, 1939

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A COMPARATIVE MENTAL-EDUCATIONAL AND MUSIC SURVEY OF THE SEVENTH AND EIGHTH GRADES OF DEMING SCHOOL, TERRE HAUTE, INDIANA, IN APRIL, 1939

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TABLE OF CONTENTS

CHAPTER		PAGE
I.	THE PROBLEM AND ITS SIGNIFICANCE	1
	The problem	2
	Statement of the problem	2
	Importance of the problem	4
	Method of procedure	5
	Organization of the remainder of the thesis .	10
II.	REVIEW OF RELATED LITERATURE	11
	The nature and function of measurement . . .	11
	Mental-educational studies	15
	Studies in the field of music	18
III.	REPORT OF THE FINDINGS	24
	General findings	24
	Tests given and number of children tested .	24
	Grade norms	26
	Results of the Otis Quick Scoring Mental Ability Test--Beta A	26
	Intelligence Quotients	26
	Comparison of the median Chronological Ages with the standard norms	31
	Comparison of the median Mental Ages and the standard norms	37

CHAPTER PAGE

Comparison of the median Mental Ages and the median Chronological Ages 37
Results of the Metropolitan Achievement Test--Battery E 41
Comparison of the median Educational Ages and the standard norms 41
Comparison of the median Educational Ages and the median Mental Ages 44
Correlation of the Mental Ages and the Educational Ages 46
Results of the Seashore Musical Talent Tests 48
Pupils' ranks on the Seashore Tests 49
Musical talent of the pupils, as a group . 59
Comparison of the Seashore medians with the standard average, by classes 61
Correlation of the musical talent average scores and the Intelligence Quotients . . 67
Results of the Knuth Achievement Tests in Music 69
Comparison of the Knuth medians and the standard norms, by classes, and for the entire group 69

CHAPTER PAGE

Correlation of the Knuth achievement scores and the Seashore average musical talent scores 72

Correlation of the Knuth achievement scores and the Educational Ages 73

Results of the Kwalwasser-Ruch Test of Musical Accomplishment 74

Comparison of the Kwalwasser-Ruch medians and the standard norms 75

Correlation of the Kwalwasser-Ruch scores and the Seashore scores 76

Correlation of the Kwalwasser-Ruch scores and the Educational Ages 79

The effect of special music training on the pupils' scores on the music tests 81

Profiles of six cases from the entire group . 84

IV. SUMMARY AND CONCLUSIONS 90

Summary 90

Conclusions 94

BIBLIOGRAPHY 96

LIST OF TABLES

TABLE		PAGE
I.	Tests Given and Number of Children Tested, by Classes	25
II.	Highest and Lowest Intelligence Quotients, Quartiles, Median Intelligence Quotient, and Quartile Deviation for Each Class and for the Entire Group	27
III.	Percentages of Intelligence Quotients, by Classes, to Show Relative Degrees of Ability	30
IV.	Percentages of Intelligence Quotients at the Various Levels Represented by the Histogram	33
V.	Percentages of Intelligence Quotients of all Pupils of the Seventh and Eighth Grades to Show Relative Degrees of Ability	34
VI.	Highest and Lowest Chronological Ages, Quartiles, Median Chronological Age, Standard Norm, and Quartile Deviation for Each Class	35
VII.	Highest and Lowest Mental Ages, Quartiles, Median Mental Age, Standard Norm, and Quartile Deviation for Each Class	38

TABLE		PAGE
VIII.	Highest and Lowest Educational Ages, Quartiles, Median Educational Age, Standard Norm, and Quartile Deviation for Each Class	42
IX.	Coefficients of Correlation of the Mental Ages and Educational Ages, by Classes . . .	48
X.	Rankings of the 7B's on the Seashore Tests .	50
XI.	Rankings of the 7A's on the Seashore Tests .	52
XII.	Rankings of the 8B's on the Seashore Tests .	54
XIII.	Rankings of the 8A's on the Seashore Tests .	56
XIV.	Average Seashore Centile Scores at Twelve Different Ability Levels	59
XV.	Highest and Lowest Scores, Quartiles, Medians, Standard Average, and Quartile Deviations for the Seashore Musical Talent Tests for Each Class and for the Entire Group	62
XVI.	Coefficients of Correlation of the Musical Talent Average Scores and the Intelligence Quotients, by Classes	68
XVII.	Highest and Lowest Scores, Quartiles, Median, Standard Norm, and Quartile Deviation for the Knuth Achievement Test for Each Class and for the Entire Group	70

TABLE PAGE

XVIII. Coefficients of Correlation of the Knuth Achievement Scores and the Seashore Average Scores 73

XIX. Coefficients of Correlation of the Knuth Achievement Scores and the Educational Ages, by Classes 74

XX. Highest and Lowest Scores, Quartiles, Median, Standard Norm, and Quartile Deviation for the Kwalwasser-Ruch Achievement Test for Each Class and for the Entire Group 76

XXI. Coefficients of Correlation for the Kwalwasser-Ruch Achievement Scores and the Seashore Musical Talent Scores, by Classes 78

XXII. Coefficients of Correlation for the Kwalwasser-Ruch Achievement Scores and the Educational Ages, by Classes 80

XXIII. Forty-one Pupils with Special Music Training and Their Scores on the Music Tests 82

XXIV. Medians for Pupils with Special Music Training and for Pupils without Special Music Training 83

TABLE PAGE

XXV. Means and Standard Deviations for Nine Measures of Ability and Achievement for the Entire Group 85

XXVI. Six Children Used in the Profiles, Their Classes, and Their Actual Scores on the Nine Tests 86

XXVII. Six Children Used in the Profiles, Their Classes, and Their Standard Scores 87

LIST OF FIGURES

FIGURE PAGE

1. Comparison of the Median Intelligence Quotients of the Classes and of the Entire Group with the Average Level of Intelligence Quotients 28
2. Histogram Representing Various Levels of the Intelligence Quotients of the Seventh and Eighth Grade Children of Deming School in April, 1939 32
3. Comparison of the Median Chronological Ages, by Classes, with the Standard Norms 36
4. Comparison of the Median Mental Ages, by Classes, with the Standard Norms 39
5. Comparison of the Median Chronological Ages and Median Mental Ages, by Classes 40
6. Comparison of the Median Educational Ages, by Classes, with the Standard Norms 43
7. Comparison of the Median Mental Age and the Median Educational Age, by Classes 45
8. Histogram of the Musical Talent of the Entire Group, Based on Average Seashore Centiles . . 60
9. Comparison of the Seashore Medians and the Standard Average, by Tests and by Classes . . 64

FIGURE PAGE

10. Comparison of the Seashore Medians of the Entire Group and the Standard Average, by Tests 65

11. Comparison of the Knuth Medians and the Standard Norms, by Classes and for the Entire Group 71

12. Comparison of the Kwalwasser-Ruch Medians and the Standard Norms, by Classes and for the Entire Group 77

13. Profiles Representing the Standings of Three Pupils on the Nine Measures of Ability and Achievement 88

14. Profiles Representing the Standings of Three Pupils on the Nine Measures of Ability and Achievement 89

CHAPTER I

THE PROBLEM AND ITS SIGNIFICANCE

It is needless to say that many of our schools today are so tied to tradition that they are failing in many respects to succeed as educational institutions. This realization is causing educators all over the country to do extensive research in order to show the need for change in our present educational systems. Modern trends in education advocate that instead of accepting standards based on subject matter, as were those based on social tradition, that we accept standards based on the needs of the pupils in view of our constantly changing society.

"What to teach, how to teach, and how to manage"[1] will take on a new meaning when teachers cease to teach as they were taught and accept the view of William Heard Kilpatrick that "Education is the process of building self by guiding and enriching life so that more life ensues."[2]

Since this is true, it is desirable to consider individual differences in general and special ability and to

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[1] William Heard Kilpatrick, A Reconstructed Theory of the Educative Process (New York: Bureau of Publications, Teachers College, Columbia University, 1935), p. 16.

[2] Loc. cit.

consider the various levels of achievement in both general and special fields. Such a procedure will lead teachers away from the traditionally-set grade standards, based just on "stints" of subject-matter to be mastered in a certain grade, and will create new standards which will consider the whole child in relation to his social environment and to fast changing society.

Since it is the duty of the school to give each child opportunity to develop to his maximum capacity, it is essentially desirable to conduct mental-educational surveys in order to obtain evidence necessary in planning courses of study which will meet individual needs.

Since every child should be given a chance to develop to his fullest extent in music, music surveys will serve as an aid in determining the various levels of music ability and music achievement to be considered in planning work for all individuals in the various classes.

I. THE PROBLEM

Statement of the problem. It is the aim of this mental-educational and music survey to discover for the purpose of guidance whether or not the pupils in the seventh and eighth grades at Deming School, Terre Haute, Indiana, are receiving the amount and kind of training, which will

enable them to attain their "physiological limits"[3] in music achievement standards which parallel standards of achievement in general academic fields, and in mental abilities and measures of music talent. The results of this study should provide a scientific approach to a better understanding of the needs of the children.

In studying this problem and in making a report of the study, the writer feels that the main problem may be studied most effectively by considering the following aims:

1. To compare the general ability of the seventh and eighth grade pupils of Deming School with that of any unselected group

2. To compare the median Chronological Ages with standard norms

3. To compare the median Mental Ages with standard norms

4. To compare the median Educational Ages with standard norms

5. To compare general ability as represented by Mental Ages with general achievement as represented by Educational Ages

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[3] Carl Emil Seashore, The Psychology of Musical Talent (Boston: Silver Burdett and Company, 1919), p. 51.

6. To compare the music ability of the children with standard norms

7. To compare the music achievement of the children with standard norms

8. To compare the music ability of the children with their music achievement

9. To find the effect of special music training on the achievement of pupils in music

10. To compare ability in music with general ability

11. To compare achievement in music with general achievement

12. To compare the relationship between general ability and general achievement with the relationship between music ability and music achievement

Importance of the problem. By making a mental-educational and music survey, the teachers will obtain data which will prove valuable in making comparisons which will serve in determining whether or not there is any correlation between ability and achievement in general fields and in the special field of music. By so doing, music teachers will have data for planning courses of study which will conform with modern trends in education.

Music teachers who present music which is too difficult for their pupils to comprehend and appreciate do not

take into consideration the mental and emotional development of their pupils. Consequently, the pupils lose interest in the study, form a dislike for the better music, and lose the opportunity to develop their talents.

Teachers who present music which is too easy for their pupils bring about a like situation. Their pupils become offended because they feel that the status of their musical ability has been lowered, they become lazy and discipline problems arise, and they begin to feel that music is of little importance; therefore, many talents are never discovered.

In view of the foregoing statements, it is very important that teachers make a practice of testing the pupils in their classes in order to find their mental-educational and music abilities and achievements if they wish to make music training a successful enterprise.

II. METHOD OF PROCEDURE

Five standardized tests were given--two of a general nature and three for music. Experienced teachers in the English and Social Studies departments assisted in giving the former. The writer gave all of the music tests. A special effort was made to follow all directions exactly. All tests were checked and rechecked to avoid errors.

The Otis Quick Scoring Mental Ability Tests--Beta A were given to determine the mental ability of the pupils. The Metropolitan Achievement Tests--Battery E were given to determine the pupils' general academic achievement.

In order to measure the music capacity of the pupils, four measures of musical talent tests by C. E. Seashore, State University of Iowa, were given. Measures of pitch, intensity, time, and tonal memory were used because they have been shown to be the most reliable in showing how much music talent one possesses.[3]

Each test was given three times, however, not on the same day, to all pupils in grades 7B, 7A, 8B, and 8A during the month of April, 1939. Three trials were given for each test and the best score taken in order that the most accurate measure for each capacity could be determined. All mistakes due to any disturbing factors, lack of understanding, and temporary physical ill-health were thereby avoided; also, each child was given a chance to work up to his "physiological limit"[4] by using this three stimulus approach method.

Mimeographed sheets containing one hundred squares

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[3] Lowell Mason Tilson, "A Study of the Predictive Value of Music Talent Tests for Teacher Training Purposes," The Teachers College Journal, 3:23, November, 1931.

[4] Carl Emil Seashore, op. cit.

for recording answers and other data such as name, date, test, hour, school, grade, age, years, and months were distributed to the pupils and properly filled.

Directions for each test were given by the music teacher who followed accurately the directions given in the Manual of Instructions and Interpretations for Measures of Musical Talent by C. E. Seashore. The victrola was put in good condition and set at seventy-eight revolutions per minute for all records except for the one for time which required from sixty to sixty-five revolutions per minute. Medium needles were used and new needles were used for each record. New records were purchased for this study. Sufficient preliminary drill for the purpose of making the test thoroughly comprehensible was given, after which both A and B sides of each disc, requiring from four to five minutes, were played. Mistakes were checked and the number of right and wrong answers were counted. The sum of these served as a double check.

The total number of trials in all cases was one hundred except in tonal memory which was fifty. The number of right answers was converted into composite standard scores, again using Seashore's Manual of Instructions and Interpretations. The number of right answers in tonal memory had to be multiplied by two before being converted

into standard scores.

In order to measure the ability of the pupils to recognize elements of notation used as a basis in sight reading and to comprehend music from its notation, the Achievement Tests in Music, Division III, by William E. Knuth, San Francisco State College, were used.

This test provided a means of determining whether a pupil's music reading difficulties were located in the comprehension or in the physical expression. For example, superior comprehension and inaccurate vocal or instrumental rendition implies that the pupil's difficulty is physical. Therefore, it is noted that certain physical conditions must be corrected before better performance can be attained.[5]

The pupils were given booklets and they were properly instructed to fill out all blanks on the cover. The practice sheet was given out and the music teacher explained the material presented following the directions found in Complete Manual of Directions by William Knuth.[6] After the pupils thoroughly understood how to do the test, they were instructed to turn to Test I.

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[5] William E. Knuth, Achievement Tests in Music (Recognition of Rhythm and Melody), Complete Manual of Directions (Minneapolis: Educational Test Bureau, 1936), p. 7.

[6] Ibid., pp. 9-11.

The pupils then heard the performance of the complete musical phrase in each one of the four exercises in the test played on the piano by the music teacher after which they chose the one of the four which they thought correct and marked the number of the phrase in the square provided for answers. All ten tests were given in the same way, time being given for the pupils to decide which phrase was correct in each case.

The booklets were collected and scored, using the Knuth Achievement Test Key. The score was determined by using the table showing score by using the number wrong.

In order to measure the achievement of the pupils in the typical public school music course in the junior-high-school grades, the Kwalwasser-Ruch Tests of Musical Accomplishment for grades IV to XII by Jacob Kwalwasser and G. M. Ruch, State University of Iowa, were given. They test (1) knowledge of musical symbols and terms, (2) recognition of syllable names, (3) detection of pitch errors in a familiar melody, (4) detection of time errors in a familiar melody, (5) recognition of pitch names, (6) knowledge of time signatures, (7) knowledge of key signatures, (8) knowledge of note values, (9) knowledge of rest value, and (10) recognition of familiar melodies from notation. Booklets containing the tests were distributed to

the pupils and the directions for administering the test were followed strictly. The time for the entire test was forty minutes. The booklets were collected and scored using the Key to correct answers found in the Manual of Directions.[7]

Scores for all tests were tabulated and medians, quartiles, and quartile deviations were found. Certain pairs of sets of scores were correlated for the purpose of finding their "going-togetherness." Medians and standard norms were compared, too.

III. ORGANIZATION OF THE REMAINDER OF THE THESIS

Chapter II reviews the literature related to the problem; Chapter III gives the report of the study; and Chapter IV gives the summary and conclusions. The bibliography concludes the thesis.

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7 Jacob Kwalwasser and G. M. Ruch, Manual of Directions (Iowa City, Iowa: Bureau of Educational Research and Service, 1936), p. 7.

CHAPTER II

REVIEW OF RELATED LITERATURE

Educators have realized the need for scientific study of our present-day educative processes. The purpose of this chapter is to review the literature that relates to the purposes and procedures of this particular study. This literature consists (1) of discussions related to the nature and function of measurement, (2) of reviews of mental-educational studies, and (3) of reviews of studies in the field of music.

I. THE NATURE AND FUNCTION OF MEASUREMENT

Good, Barr, and Scates state that "the object of any survey is to ascertain the conditions which prevail in a group of cases chosen for study, and is essentially a method of quantative description of the general characteristics of the group."[1]

Ernest W. Tiegs[2] says that measurement is a method of getting more accurate information than is possible without

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[1] Good, Barr, and Scates, The Methodology of Educational Research (New York: D. Appleton-Century Company, 1936), p. 1.

[2] Ernest W. Tiegs, Tests and Measurements for Teachers (Chicago: Houghton Mifflin Company, 1931), pp. 3-6.

it. Its real value is its contribution to the effectiveness of teaching and learning.

Brueckner and Melby discuss the purpose of giving a test:

> In selecting a test to be given to a class or to an individual pupil, the teacher and supervisor must have clearly in mind the purpose of giving the test. If only general information regarding the present educational status of a class is desired, a general survey test may be selected. If the purpose of the test is to determine the specific nature of pupil difficulty in some phase of reading or arithmetic, a detailed diagnostic test or exercise suitable for the purpose should be selected. Such exact information cannot be secured through the use of general survey tests. If a careful measurement is to be made of the results of an experimental study, reliable tests which will provide an accurate measurement of the educational outcomes should be selected.[3]

Brueckner and Melby[4] say, too, that subject achievement tests are used to measure achievement in a specific school subject. Such tests give more accurate information about the ability of pupils in a narrow field than is supplied by a general survey test.

Carl Holsinger[5] brings out the importance of statistical method in the application of standardized tests by

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[3] Leo Brueckner and Ernest Melby, Diagnostic and Remedial Teaching (Chicago: Houghton Mifflin Company, 1931), p. 79.

[4] Ibid., pp. 71-78.

[5] Carl J. Holsinger, Statistical Methods for Students in Education (Boston: Ginn and Company, 1928), p. 2.

stating that a sound knowledge of statistical method is imperative because problems of pupil classification, vocational guidance, diagnosis of special abilities, and evaluation of methods of instruction, etc., are best solved by the statistical method which involves the collection of appropriate data, summarization of the results, and correct inferences from the statistical findings.

Harry A. Greene gives a definite statement of the knowledge necessary in statistical procedure:

> The most important statistical techniques from the standpoint of their use and interpretation in the classroom are: (1) a knowledge of how to classify and tabulate data; (2) a knowledge of how to find the common measures of central tendency; (3) a knowledge of how to express the variability of data; (4) a knowledge of how to express relationships between two groups of arrays of data; (5) a knowledge of how to secure and use standards, norms, and derived scores for the purposes of comparison and interpretation of test results.[6]

Brueckner and Melby[7] say that, in recent years, much educational research has provided data which show the great range of individual differences among pupils. These differences exist, even in homogeneous groups.

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[6] Harry A. Greene, Work-Book in Educational Measurements (New York: Longmans, Green and Company, 1928), pp. 1-2.

[7] Leo Brueckner and Ernest Melby, op. cit., pp. 63-64.

Lewis M. Terman[8] says that although general ability has been the most important single factor in grouping, other factors are being used with greater frequency. Efforts are more frequently made to keep all pupils happily engaged in cooperation, competition, and socialization under efficient working conditions so that there will be no need for failure.

Seashore[9] has stated that his measures of music talent will help teachers of music in that they will stimulate the recognition of responsibility for the talented children of the community. They will be a definite aid in guidance for the purpose of giving vocational and avocational advice as well as constituting very profitable musical exercises.

It is stated in the editor's preface[10] of Seashore's book that by giving such a scientific test it is possible to determine which children possess musical ability of a higher order and which ones should be given the opportunity

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[8] Lewis M. Terman, "The Psychological Determinist or Democracy and the I. Q.," Journal of Educational Research, 6:57-62, 1922.

[9] Carl Emil Seashore, The Psychology of Musical Talent (Boston: Silver, Burdett and Company, 1919), Preface, p. viii.

[10] Ibid., Editor's Preface, p. vi.

to develop themselves along other musical lines.

It is interesting to note that Seashore[11] states that it is possible for a person strong in other capacities, but with relatively low intellectual power, to assume fairly important roles in music within restricted fields of activity; but the great musician is always a person of great intellect.

II. MENTAL-EDUCATIONAL STUDIES

In 1929, Olis Glen Jamison[12] made a study of the pupil personnel in Indiana State Teachers College Training School. The purpose of this study was to learn the general status of the pupils of the training school in regard to their ability and achievement. Four standardized tests were used: The Tressler English Test, Otis Intelligence Test, Stanford Achievement Test, and Hill's Civic Attitude Test. The findings of the study showed that the pupils came from homes that provided environment conducive to education, the pupils of the school were mentally stronger than pupils of other schools where the tests had been given,

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[11] Ibid., p. 253.

[12] Olis Glen Jamison, "A Study of the Pupil Personnel in Indiana State Training School," (unpublished Master's thesis, Indiana State Teachers College, Terre Haute, Indiana, 1929).

the pupils were not achieving as much as they were able to achieve, the pupils of the high school were below standard in English, there was little correlation between citizenship marks and scores on the Civic Attitudes Test, and there were special cases in all grades that needed special attention.

Pansy Walker[13] made a mental-educational survey of Rea School, Terre Haute, Indiana. The purpose of this study was to furnish the nucleus for a cumulative record system at Rea School for the Purpose of keeping the records of intelligence and achievement tests for guidance. Comparisons were made between medians and standard norms. The result of this study has been the use of such a system of recording with the thought in mind that it is necessary to judge children from a cumulative record rather than from the results of only one test.

In 1938, Olga Andrews Combs[14] studied the pupils of the Indiana State Teachers College Laboratory School, Terre

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[13] Pansy B. Walker, "A Comparative Mental-Educational Survey of Rea School, Terre Haute, Indiana," (unpublished Master's thesis, Indiana State Teachers College, Terre Haute, Indiana, 1937).

[14] Olga Andrews Combs, "A Mental-Educational Survey of the Pupils in Grades 2A to 8A of the Indiana State Teachers College Laboratory School in January, 1938," (unpublished Master's thesis, Indiana State Teachers College, Terre Haute, Indiana, 1939).

Haute, Indiana, (1) to compare the children of the 1938 Laboratory School and the 1929 Training School, (2) to compare ability with achievement in reading, and (3) "to determine the degree of need for more testing, for re-adjustment of the present curriculum, and for an ungraded room."[15]

The Otis Intelligence Tests, Primary and Advanced, were used to measure the ability of the children and the New Stanford Reading test was used to measure achievement in reading. Statistical procedures included finding the medians, quartiles, and quartile deviations of all sets of scores. The medians were compared with the standard norms. Comparisons were made between the results of this study and the results of the study of the 1929 Training School made by Olis Glen Jamison.[16]

The findings showed that the group, as a whole, (1) compared favorably with any group of unselected children, (2) was young, chronologically, (3) was satisfactory, mentally, and (4) had satisfactory Reading Ages and Reading Grades. There were special cases in each class, however, that needed special attention. The comparisons with the

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[15] Ibid., p. 2.

[16] Olis Glen Jamison, op. cit.

1929 Training School showed that (1) the higher social levels were represented in the old Training School, (2) the children in 1938 were older, chronologically, (3) the children in 1938 had lower Mental Ages, and (4) the children in 1938 had slightly better Reading Ages than those in 1929.

Mrs. Combs recommended[17] that provisions be made for the different ability groups and that an ungraded room be arranged for the twenty-five children with Intelligence Quotients of seventy-seven or less.

III. STUDIES IN THE FIELD OF MUSIC

In 1928, Emerson S. Van Cleave[18] studied the music achievement in the 4A, 6A, and 8A grades of the Terre Haute public schools as measured by the Knuth Achievement Test. Music achievement as represented by the scores on the Knuth Tests was compared with the standard norms; results on the tests of those having had private music instruction on some recognized instrument, where note reading was

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[17] Olga Andrews Combs, op. cit., p. 150.

[18] Emerson S. Van Cleave, "Music Achievement in the 4A, 6A, and 8A Grades of the Terre Haute Public Schools as Measured by Knuth Achievement Test," (unpublished Master's thesis, Indiana State Teachers College, Terre Haute, Indiana, 1938).

involved, were compared with the results of those who had not had any instruction besides the regular school-room training; the composite scores of 108 eighth grade junior-high-school pupils on the Seashore Talent Tests and the scores made by the same group on the Knuth Achievement Tests were correlated; and the Intelligence Quotients of eighty-four eighth grade junior-high-school pupils and their scores in music achievement were correlated.

The results of this study showed that all grades were below the norm, but the eighth grade more nearly reached it; those with special music training did better than the others; and a low coefficient of correlation (.35) was found between the Intelligence Quotients and music achievement.

In 1934, F. Willard Critchfield[19] studied the correlation between musical talent test scores and arithmetic marks for pupils in the fifth to eighth grades, inclusive. In addition, an attempt was made to compare the musical talent and music reading ability.

The results showed that a very slight relationship

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[19] F. Willard Critchfield, "A Study of the Correlation between Musical Talent Test Scores and Arithmetic Marks for Pupils in Grades Five, Six, Seven, and Eight," (unpublished Master's thesis, Indiana State Teachers College, Terre Haute, Indiana, 1934).

existed between musical talent and mathematical ability--too small to be of predictive value. The findings did not justify the postponement of formal instruction in music until a proper background be acquired in mathematics. The relationship between musical talent and music reading seemed to indicate that a teacher might be concerned when a pupil's marks in music reading seem not to equal his musical talent. The relationship between musical talent and music reading was found to be much greater than between musical talent and mathematical ability.

In 1931, Professor Lowell M. Tilson[20] of the Indiana State Teachers College, Terre Haute, Indiana, found a low coefficient of correlation (.159 .06) between musical talent as shown by the scores made on the Seashore Musical Talent Tests and the psychological ratings made on the American Council Psychological Examination.

Again, Professor Tilson[21] reports the study of music achievement and psychological ratings of students at Indiana State Teachers College, Terre Haute, Indiana. The main

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[20] Lowell M. Tilson, "A Study of the Predictive Value of Musical Talent Tests for Teacher-Training Purposes," The Teachers College Journal, 3:101-129, 1931.

[21] Lowell M. Tilson, "The Music Achievement of College Students at Various Levels of Music Talent and Psychological Rating," The Teachers College Journal, 6:169-176, May, 1935.

purpose of the study was to learn the "musical achievement of college students at various levels of music talent and psychological rating."[22] This study was conducted over a period of ten years. During that time, the department of music of the college recorded the music talent scores and psychological percentiles of its entering freshmen students. In addition to the main problem, ten special problems were listed. Music talent was determined by the use of the Seashore Music Talent Tests.

The conclusions listed in this study, that seem to be pertinent, follow:

> The correlation between music talent scores and quarter grades in ear training and sight singing is .461 .027.
>
> . . . . . .
>
> Eighty-five per cent of the students whose music talent scores fall in the lowest quarter make grades below the median, and fifty-four per cent of those whose talent scores fall in the highest quarter make grades above the median.[23]

Professor Tilson feels that it is possible and practical to use the findings of this study for predictive purposes.

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[22] Ibid., p. 169.

[23] Ibid., p. 175.

William S. Larson[24] of the Eastman School of Music, Rochester, New York, made a study, in 1930, in the field of pupil guidance. He attempted to find a way to predict success in the field of instrumental music. Mr. Larson found that pupils ranking high on the Seashore Musical Talent Tests were the ones who were most likely to succeed in orchestra work.

In 1930, Katherine U. Rogers[25] considered the value of the Seashore Tests in her study of the music curriculum for the junior high school. She stated that music talents are inborn and are not subject to modification through education; that talent is often found where it is least suspected; that many pupils in the lower grades if given the chance might do better in music than the pupils in the intermediate and upper grades; that tests are not made for the purpose of picking out a few talented children but for the purpose of evaluating the powers of the pupils so that they may receive the proper kind of instruction; also, that the tests may be used for ascertaining knowledge

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[24] William S. Larson, "Measurements of Musical Talent for the Prediction of Success in Instrumental Music," University of Iowa Studies in Psychology, XIII (1930), p. 33.

[25] Katherine U. Rogers, "Curriculum in Music for the Junior High School," (unpublished Master's thesis, Indiana State Teachers College, Terre Haute, Indiana, 1930).

which may be used for vocational guidance.

Another use of the Seashore Tests is that of rating children according to their capacities for the purpose of curriculum making. Ruth Songer Henderson[26] studied the curriculum in music for the first six grades. She, too, recognized the value of the Seashore Tests in a scientific study of the child and of the curriculum.

The practical value of the Seashore Tests has been proved by John Bright[27] in his study of the predictive value of these tests in public school music classes in Huntingburg, Indiana. He brings out the fact that these tests furnish an insight into the capacities of the pupils; that they serve as an aid in organizing work in such a way that individual differences will be taken care of; that they help in providing material which will improve instruction; and that they are valuable in planning the musical future of the pupils by encouraging those with exceptional ability to study music as a career and by stimulating others of ordinary music talent to enjoy and appreciate music as deeply as their limitations will permit.

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[26] Ruth Songer Henderson, "A Curriculum in Music for the First Six Grades," (unpublished Master's thesis, Indiana State Teachers College, Terre Haute, Indiana, 1930).

[27] John Bright, "A Study of the Predictive Value of the Seashore Music Tests in the Public School Music Classes in Huntingburg, Indiana," (unpublished Master's thesis, Indiana State Teachers College, Terre Haute, Indiana, 1937).

CHAPTER III

REPORT OF THE FINDINGS

The findings of this study are organized under the following topics: (1) general findings, (2) results of the Otis Quick Scoring Mental Ability Test--Beta A, (3) results of the Metropolitan Achievement Test--Battery E, (4) results of the Seashore Musical Talent Tests, (5) results of the Knuth Achievement Tests in Music, (6) results of the Kwalwasser-Ruch Test of Musical Accomplishment for Grades IV to XII, (7) the effect of special music training on pupils' scores on the music tests, and (8) profiles of certain selected cases from the entire group.

I. GENERAL FINDINGS

Tests given and number of children tested. Table I, p. 25, lists the five tests that were given--the Otis Mental Ability Test to measure general ability, the Metropolitan Test to measure achievement in the academic fields, the four Seashore Tests to measure ability in music, and the Knuth and Kwalwasser-Ruch Tests to measure several types of achievement in music.

The tests were administered to a total of 230 children--thirty-eight 7B's, sixty-six 7A's, fifty-two 8B's,

TABLE I

TESTS GIVEN AND NUMBER OF CHILDREN TESTED, BY CLASSES

Tests	Classes				
	7B	7A	8B	8A	Total
Otis Quick Scoring Mental Ability Test--Beta A	38	66	52	74	230
Metropolitan Achievement Test --Battery E	38	66	52	74	230
Measures of Musical Talent by Seashore, Grades 5 to Adult--Pitch, Intensity, Time, and Tonal Memory	38	66	52	74	230
Knuth Achievement Tests in Music for Recognition of Certain Rhythmic and Melodic Aspects	38	66	52	74	230
Kwalwasser-Ruch Test of Musical Accomplishment, Grades IV-XII	38	66	52	74	230

and seventy-four 8A's.

Grade norms. Since the pupils were tested in April, the following grade norms were assigned the four classes: (1) 7B, 7.3; (2) 7A, 7.8; (3) 8B, 8.3; and (4) 8A, 8.8. These grade norms were for the purpose of determining the standard norms for the Mental Ages, Chronological Ages, and Educational Ages.

II. RESULTS OF THE OTIS QUICK SCORING MENTAL ABILITY TESTS--BETA A

This section of the report of the findings discusses all of the data from the Otis Mental Ability Tests: (1) Intelligence Quotients, (2) Chronological Ages, (3) Mental Ages, and (4) comparison of the Chronological Ages and Mental Ages.

Intelligence Quotients. Table II, p. 27, lists the highest Intelligence Quotient, the lowest Intelligence Quotient, the quartiles, the median, and the quartile deviation for each class and for the entire group. Figure 1, p. 28, shows, graphically, the relationship between the median Intelligence Quotients shown in Table II and the average level of Intelligence Quotients--90-110.

The intelligence of the group, as a whole, compares

TABLE II

HIGHEST AND LOWEST INTELLIGENCE QUOTIENTS, QUARTILES, MEDIAN INTELLIGENCE QUOTIENT, AND QUARTILE DEVIATION FOR EACH CLASS AND FOR THE ENTIRE GROUP

Classes	Highest I. Q.	Lowest I. Q.	Q^3	Median I. Q.	Q^1	Q
7B	133	71	115.3	100.0	92.0	11.7
7A	129	70	106.4	99.3	92.2	7.1
8B	119	63	103.7	94.2	89.0	7.4
8A	124	66	109.8	99.9	89.3	10.3
Entire Group	133	63	107.7	98.5	90.6	8.6

fairly well with that of any unselected group of children. The median Intelligence Quotient for the group is 98.5--1.5 less than 100, which is the mid-point of the average level of Intelligence Quotients.

The median Intelligence Quotient of the 7B class is exactly 100; the 8A class is practically the same with a median Intelligence Quotient of 99.9; the 7A class ranks next with a median Intelligence Quotient of 99.3; and the 8B class ranks lowest with a median Intelligence Quotient of 94.2 which brings the group median down to 98.5. All of these medians fall at or below the mid-point of the average level of Intelligence Quotients as shown by Figure 1, p. 28.

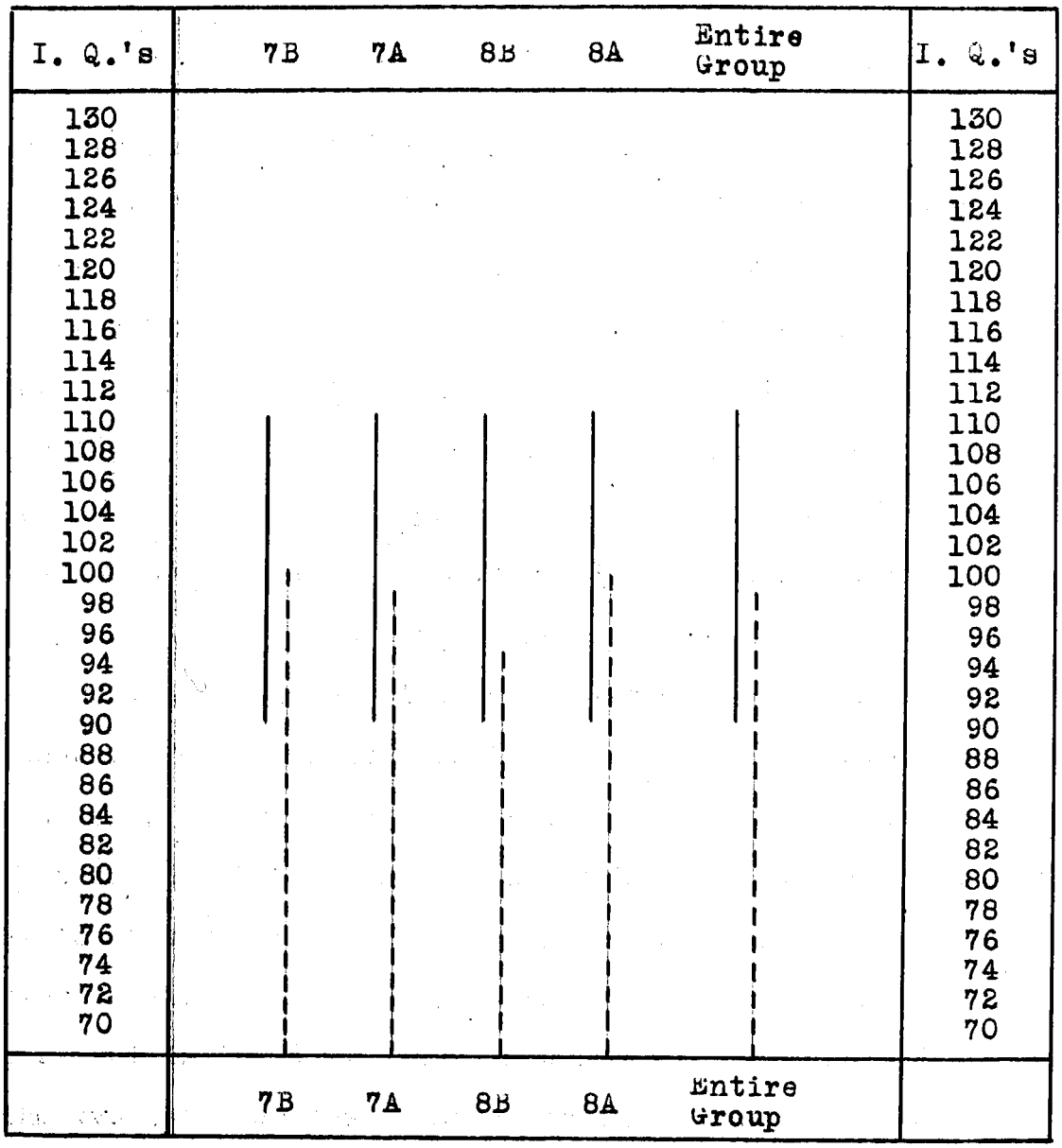

FIGURE 1

COMPARISON OF THE MEDIAN INTELLIGENCE QUOTIENTS OF THE CLASSES AND OF THE ENTIRE GROUP WITH THE AVERAGE LEVEL OF INTELLIGENCE QUOTIENTS

A further analysis of the Intelligence Quotients of each class is made in Table III, p. 30, which gives the percentages of Intelligence Quotients, by classes, to show relative degrees of ability. It seems from the percentages shown in this table that the median Intelligence Quotient for the 7B class would be more than 100. The largest percentage for that class, 55.3, is found at the normal level and there are larger percentages above this point than below it. This may be explained by the fact that fourteen of the twenty-one cases located at the normal level are actually located between ninety and ninety-nine.

The 7A and 8A classes are evenly balanced, which accounts for their practically normal median Intelligence Quotients of 99.3 and 99.9, respectively. We find, however, that the 8B class is not evenly balanced. It has no cases at the two upper levels, a very small percentage with superior intelligence, 57.6 per cent at the normal level, 25 per cent in the dull group, and 3.9 per cent in each of the two lower groups. These percentages account for the fact that the 8B class has the lowest median Intelligence Quotient--94.2.

The quartile deviations show how widely the scores are scattered about the medians. These deviations rank from the highest to the lowest in the following manner: (1)

TABLE III

PERCENTAGES OF INTELLIGENCE QUOTIENTS, BY CLASSES, TO SHOW RELATIVE DEGREES OF ABILITY

Intelligence Quotients	Classes							
	7B		7A		8B		8A	
	Number of Cases	Per Cent	Number of Cases	Per Cent	Number of Cases	Per Cent	Number of Cases	Per Cent
Genius or near Genius, above 139	0	0.0	0	0.0	0	0.0	0	0.0
Very Superior Intelligence, 120-139	5	13.1	1	1.5	0	0.0	5	6.8
Superior Intelligence, 110-119	6	15.8	7	10.6	5	9.6	15	20.3
Normal or Average, 90-109	21	55.3	47	71.2	30	57.6	32	43.2
Dullness, 80-89	4	10.5	8	12.1	13	25.0	16	21.6
Borderline Deficiency, 70-79	2	5.3	3	4.6	2	3.9	4	5.4
Definitely Feebleminded, below 70	0	0.0	0	0.0	2	3.9	2	2.7
Total	38	100.0	66	100.0	52	100.0	74	100.0

7B, 11.7; (2) 8A, 10.3; (3) 8B, 7.4; and (4) 7A, 7.1.

Figure 2, p. 32, shows the distribution of the Intelligence Quotients of the entire group in the form of a histogram. Table IV, p. 33, gives the percentages of Intelligence Quotients at the various levels represented by the histogram. The largest percentage is found at the 88-93 level--20.0. An irregularity in the steps of the histogram occurs at the 100-105 level. The steps at the right and left extremes of the curve are more regular than those at the top.

The group, as a whole, is pictured in still another way in Table V, p. 34. Here we find the percentages of intelligence Quotients at various levels of ability. The largest percentage, 56.5, is found at the normal or average level. No pupil is a genius and only 4.8 per cent have very superior intelligence. We find, however, 14.4 per cent with superior intelligence. Just below the average or normal group, we find 17.8 per cent who are dull. The borderline deficiency cases exactly equal the number with very superior intelligence. There are four pupils, or 1.7 per cent, who are definitely feebleminded.

Comparison of the median Chronological Ages with the standard norms. Table VI, p. 35, gives information about the Chronological Ages of the pupils, by classes.

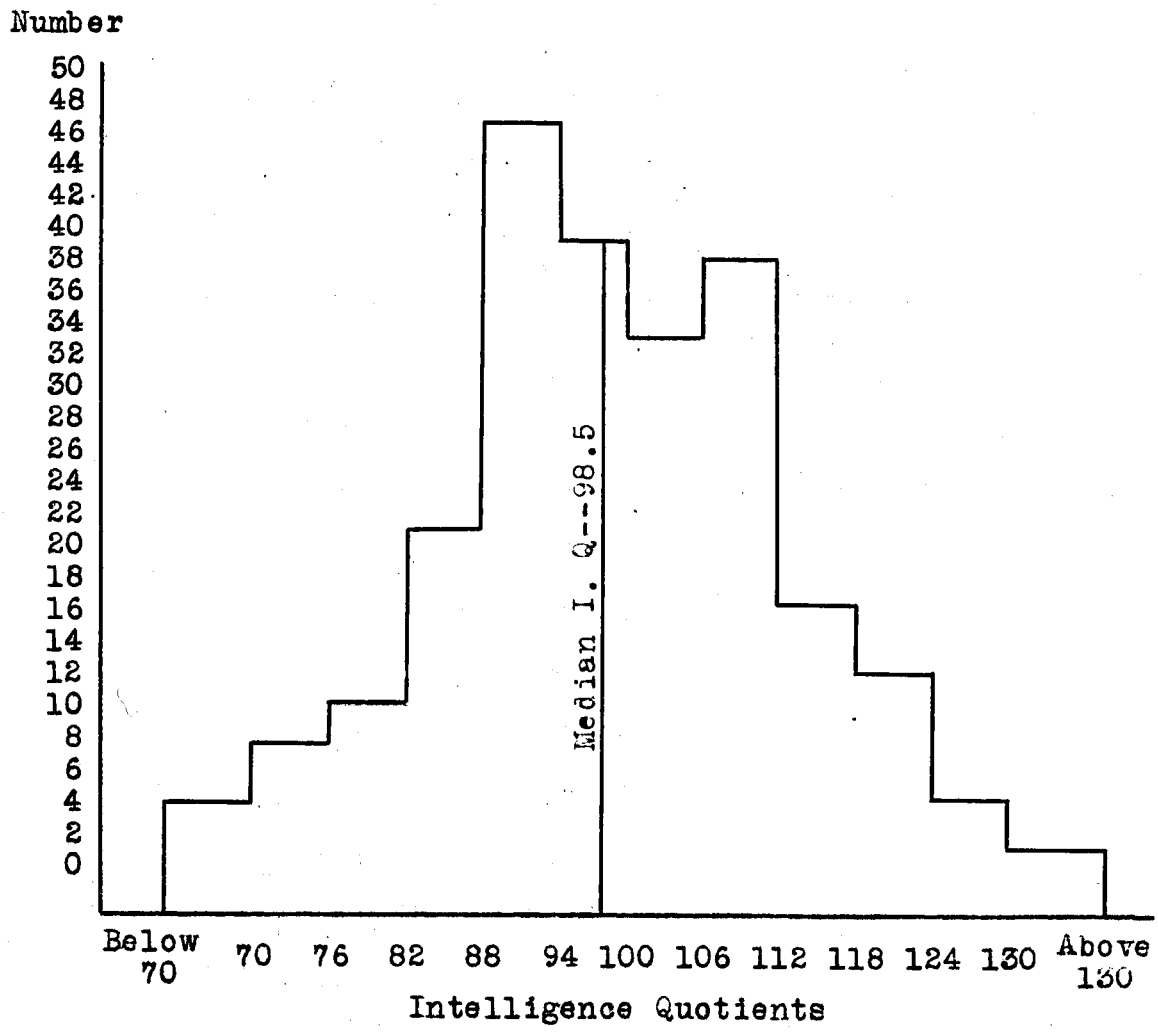

FIGURE 2

HISTOGRAM REPRESENTING VARIOUS LEVELS OF THE INTELLIGENCE QUOTIENTS OF THE SEVENTH AND EIGHTH GRADE CHILDREN OF DEMING SCHOOL IN APRIL, 1939

TABLE IV

PERCENTAGES OF INTELLIGENCE QUOTIENTS AT THE VARIOUS LEVELS REPRESENTED BY THE HISTOGRAM

Intervals	Number of Cases	Per Cents
Below 70	4	1.7
70-75	7	3.0
76-81	10	4.4
82-87	21	9.1
88-93	46	20.0
94-99	39	17.0
100-105	33	14.4
106-111	37	16.1
112-117	16	7.0
118-123	12	5.2
124-129	4	1.7
Above 130	1	0.4
Total	230	100.0

TABLE V

PERCENTAGES OF INTELLIGENCE QUOTIENTS OF ALL PUPILS OF THE SEVENTH AND EIGHTH GRADES TO SHOW RELATIVE DEGREES OF ABILITY

Intelligence Quotients	Number of Pupils	Per Cent
Genius or near Genius, above 139	0	0.0
Very Superior Intelligence, 120-139	11	4.8
Superior Intelligence, 110-119	33	14.4
Normal or Average, 90-109	130	56.5
Dullness, 80-89	41	17.8
Borderline Deficiency, 70-79	11	4.8
Definitely Feebleminded, below 70	4	1.7
Total	230	100.0

The quartile deviations show the greatest range in the scores of the 7A class, with a quartile deviation of 8.0 months. The other classes rank in the following order, from the highest to the lowest quartile deviation: 8A, 7.0; 8B, 6.5; and 7B, 5.5.

Figure 3, p. 36, compares, graphically, the median Chronological Ages and the standard norms. These standard norms were found by using the grade norms discussed under "General Findings," p. 26, and the table of Age and Grade

TABLE VI

HIGHEST AND LOWEST CHRONOLOGICAL AGES, QUARTILES, MEDIAN CHRONOLOGICAL AGE, STANDARD NORM, AND QUARTILE DEVIATION FOR EACH CLASS

Classes	Highest C. A.	Lowest C. A.	Q^3	Median C. A.	Standard Norm	Q^1	Q
7B	15-1	11-0	13-1	12-6	12-10	12-2	5.5*
7A	15-11	12-0	14-0	13-1	13-4	12-8	8.0
8B	17-2	12-5	14-6	13-11	13-9	13-5	6.5
8A	16-3	13-1	14-10	14-1	14-3	13-8	7.0

* The quartile deviation is given in months. The other columns are given in years and months.

Equivalents, p. 11 of the Manual of Instructions for the Metropolitan Achievement Tests.

Three classes--7B, 7A, and 8A--have median Chronological Ages below the standard norms; that is, these classes, as groups, are young for their grades. The 7B median Chronological Age is four months below the norm; the 7A, three months below; and the 8A, two months below. These three classes are the ones whose median Intelligence Quotients stand at or very near 100.

The 8B class, however, has a median Chronological Age that is two months above the norm. This class, as a group, is slightly older, chronologically, than the average.

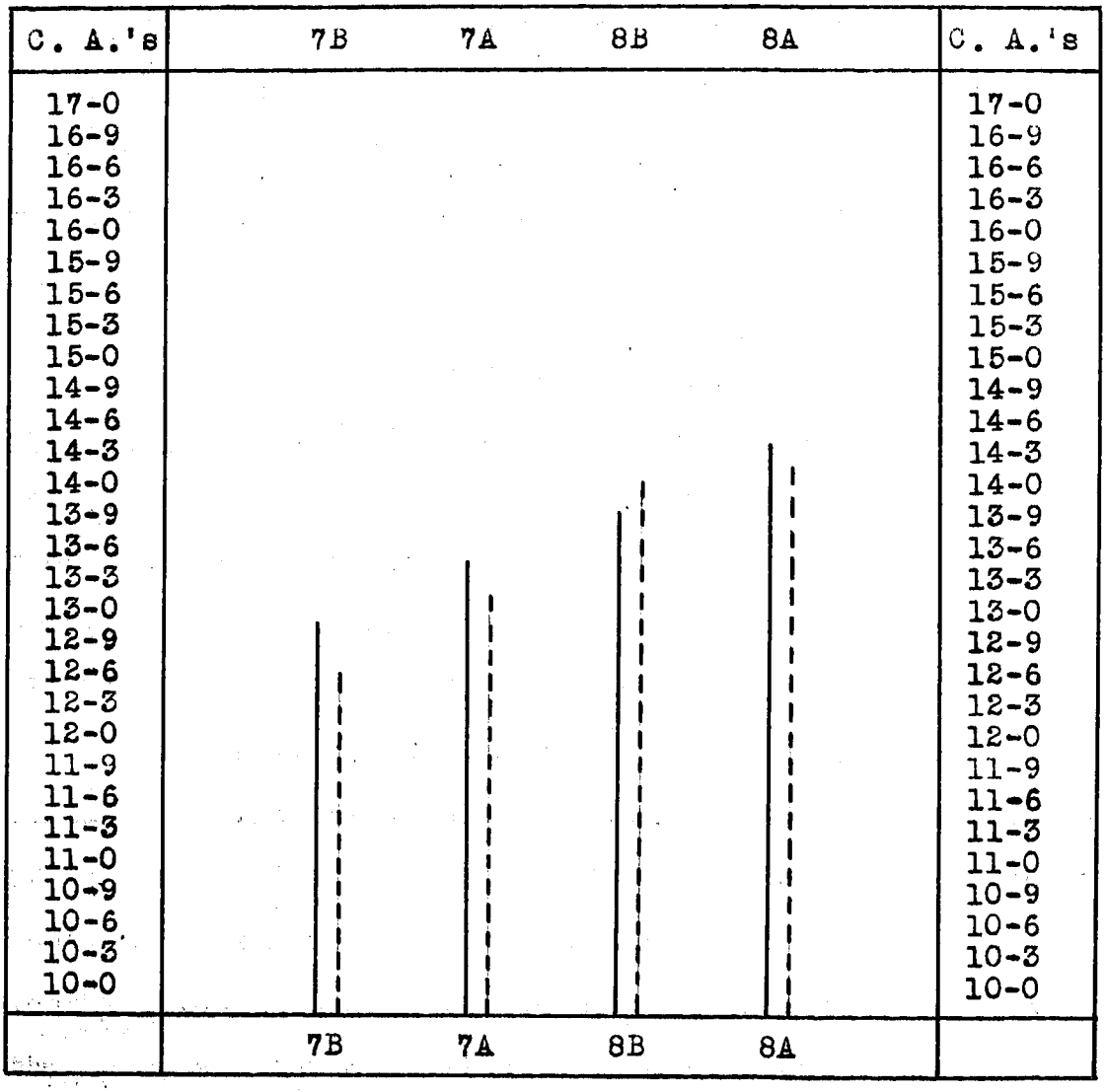

FIGURE 3

COMPARISON OF THE MEDIAN CHRONOLOGICAL AGES, BY CLASSES, WITH THE STANDARD NORMS

Its median Intelligence Quotient is the lowest of the four classes. This class includes a number of children who are retarded. With this, we find, also, the fact that the ones who are retarded have a degree of intelligence below the average.

Comparison of the median Mental Ages and the standard norms. Table VII, p. 38, gives information about the Mental Ages of the pupils, by classes. The quartile deviations show that the ranges of ages rank in the following order, from the highest to the lowest quartile deviation: (1) 7B, 19.5; (2) 8A, 17.5; (3) 8B, 14.5; and (4) 7A, 10.0.

Figure 4, p. 39, compares, graphically, the median Mental Ages and the standard norms. Only one class, the 7B's, has a median Mental Age above the norm. It is one month above the norm. The 7A median Mental Age is three months below the norm; the 8A median, four months below the norm; and the 8B median, nine months below the norm. The facts revealed by these comparisons are, necessarily, consistent with the median Intelligence Quotients.

Comparison of the median Mental Ages and the median Chronological Ages. Figure 5, p. 40, shows, graphically, the relationship between the median Chronological Ages and the median Mental Ages. The outstanding "plus"

TABLE VII

HIGHEST AND LOWEST MENTAL AGES, QUARTILES, MEDIAN MENTAL AGE, STANDARD NORM, AND QUARTILE DEVIATION FOR EACH CLASS

Classes	Highest M. A.	Lowest M. A.	Q^3	Median M. A.	Standard Norm	Q^1	Q
7B	16-4	8-11	14-10	12-11	12-10	11-7	19.5*
7A	17-4	9-8	13-11	13-1	13-4	12-3	10.0
8B	16-4	8-11	14-2	13-0	13-9	11-9	14.5
8A	17-6	10-0	15-3	13-11	14-3	12-4	17.5

* The quartile deviation is given in months. The other columns are given in years and months.

difference in favor of the Mental Ages is found in the comparison of the 7B medians. The median Mental Age is five months higher than the median Chronological Age. This class shows evidence of being very capable, mentally.

The 8B medians show an outstanding "plus" difference in favor of the Chronological Ages, the median Chronological being eleven months higher than the median Mental Age. This class shows evidence of being dull.

The 7A median Chronological Age and median Mental Age are exactly the same, but three months below the norm. The 8A class has a median Mental Age two months below the median Chronological Age.

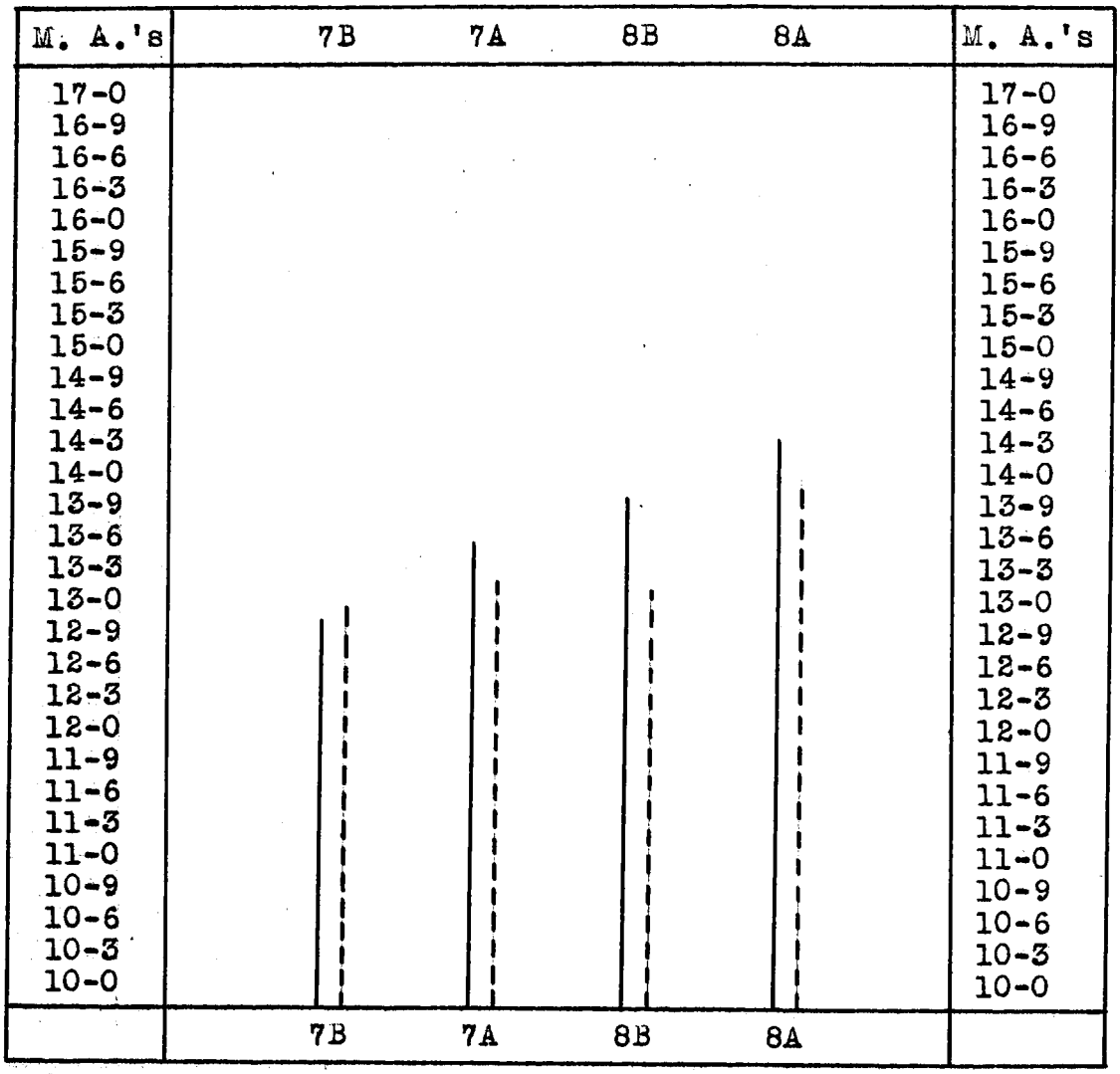

FIGURE 4

COMPARISON OF THE MEDIAN MENTAL AGES, BY CLASSES, WITH THE STANDARD NORMS

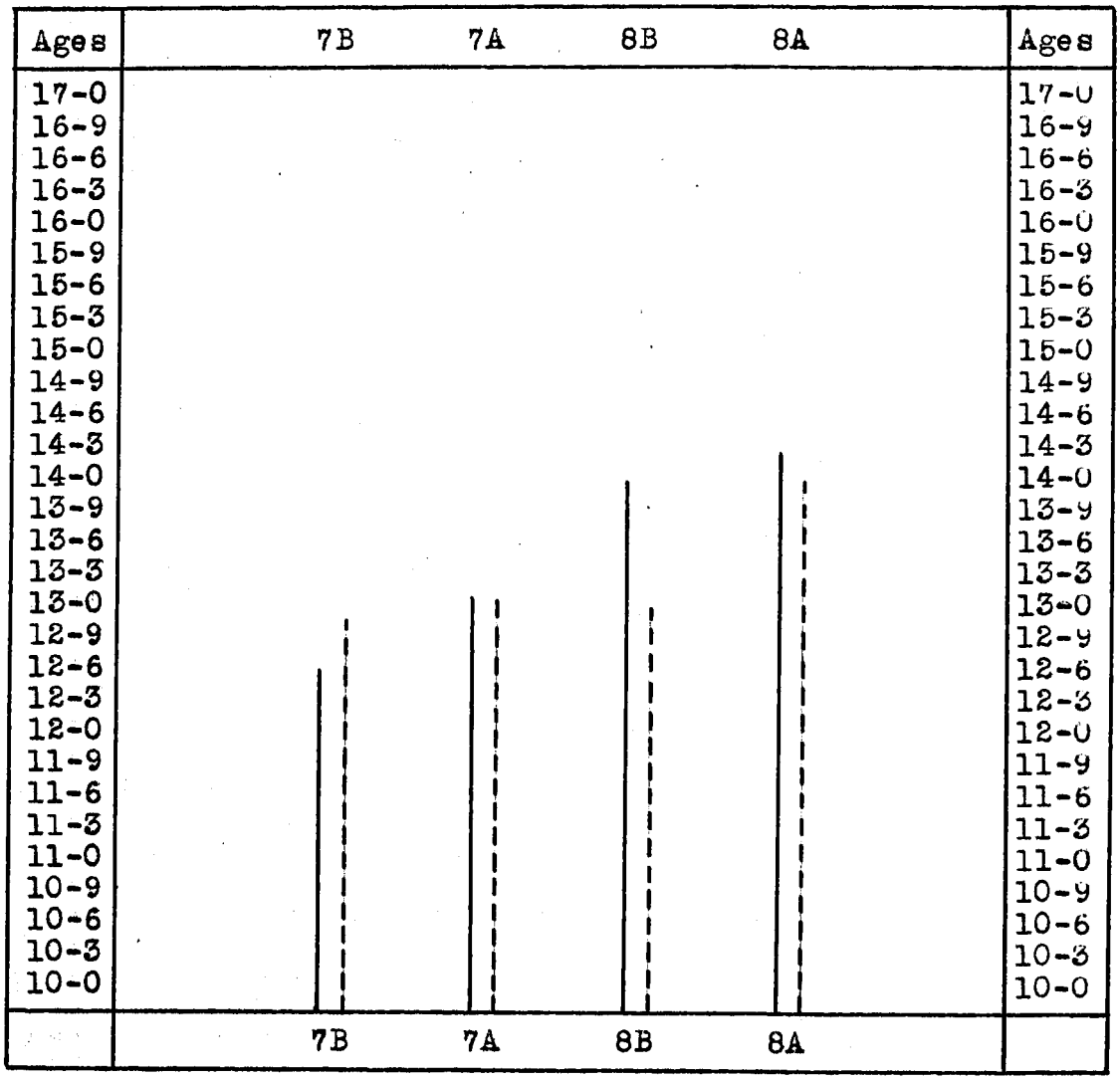

FIGURE 5

COMPARISON OF THE MEDIAN CHRONOLOGICAL AGES AND MEDIAN MENTAL AGES, BY CLASSES

Summarizing these comparisons, these classes seem to arrange themselves in the following order of ability, from the highest to the lowest: (1) 7B, (2) 7A, (3) 8A, and (4) 8B.

III. RESULTS OF THE METROPOLITAN ACHIEVEMENT TEST--BATTERY E

The Metropolitan Achievement Test--Battery E consists of a series of tests in the academic fields--reading, vocabulary, arithmetic fundamentals, arithmetic problems, English, literature, history, geography, and spelling. This series of tests seeks to measure the achievement made in these various subjects. The score for each subject and the total score are translated into grade and age equivalents by the use of the table on p. 11 of the Manual of Directions. The age equivalent for the total score is used in this study as the Educational Age. It represents the general achievement of the pupils.

This section of the report (1) compares the median Educational Ages and the standard norms, (2) compares the median Educational Ages and the median Mental Ages, and (3) correlates the Educational Ages and the Mental Ages.

Comparison of the median Educational Ages and the standard norms. Table VIII, p. 42, records the essential

TABLE VIII

HIGHEST AND LOWEST EDUCATIONAL AGES, QUARTILES, MEDIAN EDUCATIONAL AGE, STANDARD NORM, AND QUARTILE DEVIATION FOR EACH CLASS

Classes	Highest E. A.	Lowest E. A.	Q_3	Median E. A.	Standard Norm	Q_1	Q
7B	15-11	11-5	13-11	13-0	12-11	12-5	9.0*
7A	15-3	11-4	13-8	13-1	13-4	12-8	6.0
8B	14-10	10-11	13-8	13-1	13-9	12-8	6.0
8A	15-8	11-5	14-4	13-9	14-3	13-2	7.0

* The quartile deviation is given in months. The other columns are given in years and months.

facts about the Educational Ages. The quartile deviations show that the ranges of scores for the classes rank in the following order, from the highest to the lowest quartile deviation: (1) 7B, 9.0; (2) 8A, 7.0; (3) 7A and 8B, 6.0.

Figure 6, p. 43, shows, graphically, the relationship between the Educational Ages and the standard norms. Again, we find the 7B median higher than the standard norm--two months higher, in this case. This class has given a good account of itself on Intelligence Quotients, Chronological Ages, Mental Ages, and Educational Ages.

The 7A median Educational Age is three months below the norm. This class has ranked slightly below standard

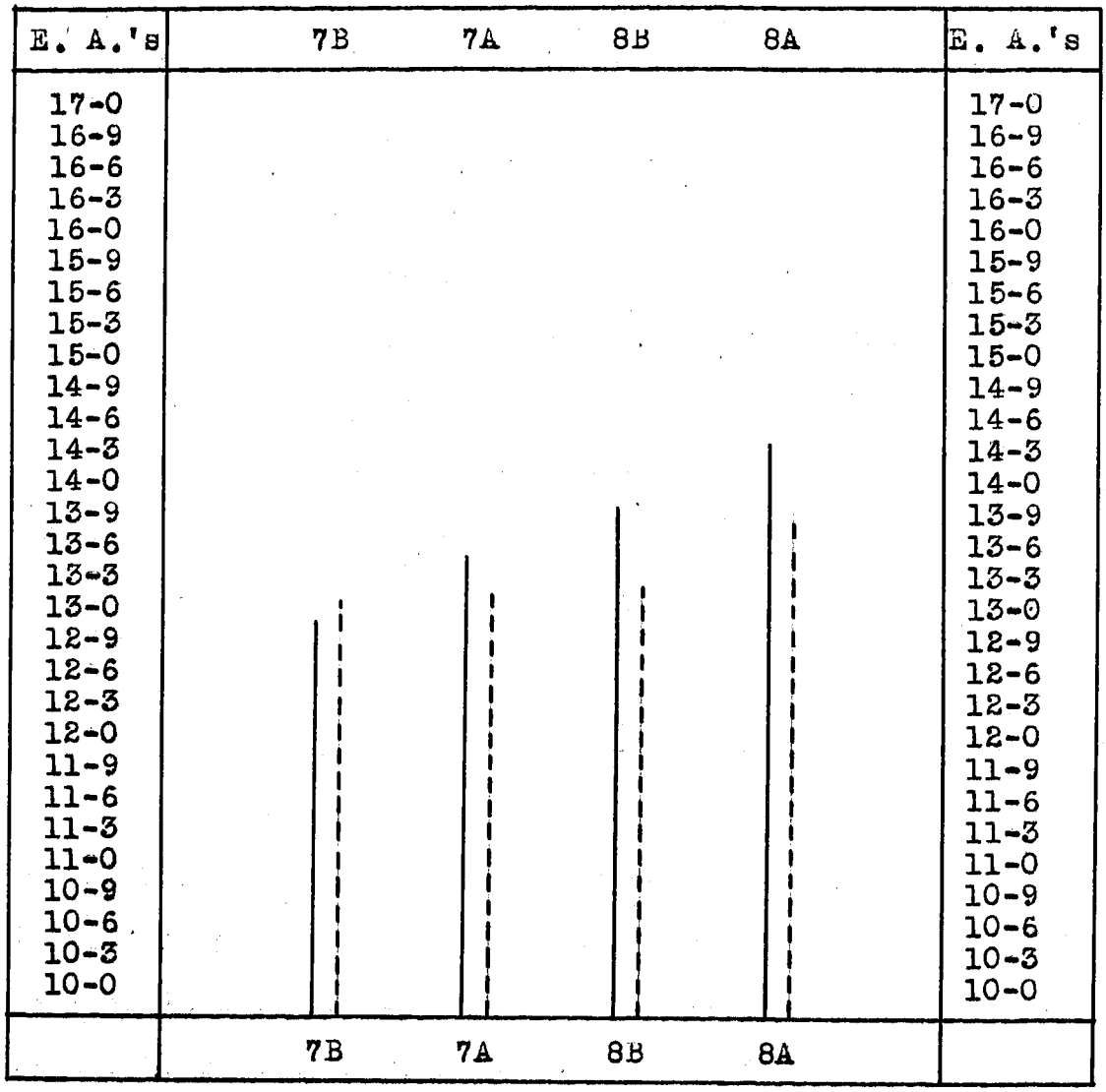

FIGURE 6

COMPARISON OF THE MEDIAN EDUCATIONAL AGES, BY CLASSES, WITH THE STANDARD NORMS

on all measures discussed previously, except the exactly equal standing of its median Chronological Age and Mental Age, which is, really, a favorable standing.

The 8A median Educational Age is six months below the norm. It seems that this class should more nearly approach the norm, since its median Intelligence Quotient--99.9--is practically 100.

The 8B median Educational Age is eight months below the norm. We expect this "minus" difference in this case, since this class has the lowest median Intelligence Quotient--94.2.

Comparison of the median Educational Ages and the median Mental Ages. It seems desirable to know the relationship between the median Educational Age and the median Mental Age in order to learn how well the children achieve in comparison with their ability to achieve. Figure 7, p. 45, shows this relationship in graphic form.

The most out-standing bit of information revealed by Figure 7 is the fact that the 8B median Educational Age is one month higher than the median Mental Age. This is an example of the psychological principle that, as a rule, individuals and groups with lower ability achieve more, comparatively speaking, than those on the higher

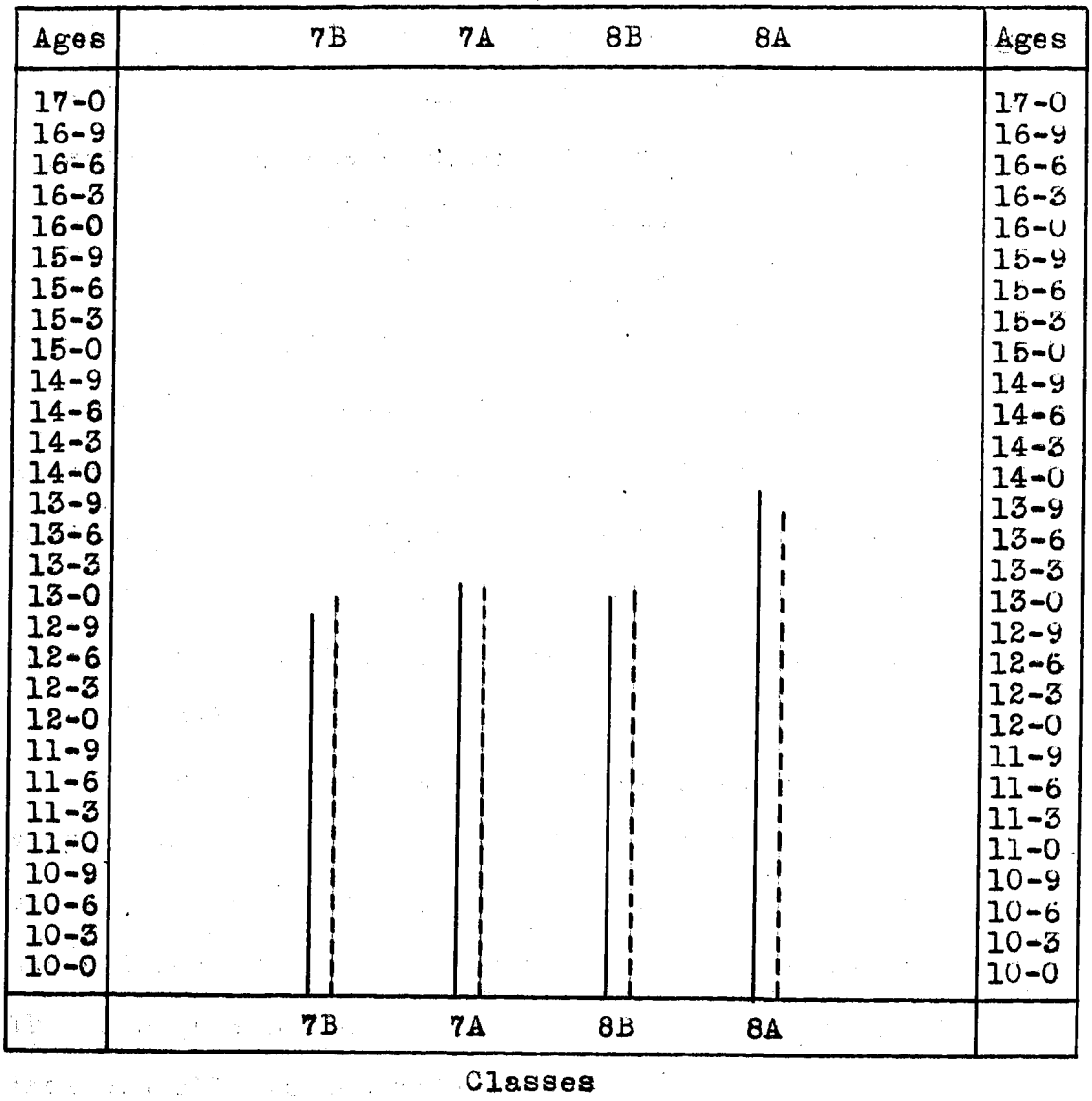

FIGURE 7

COMPARISON OF THE MEDIAN MENTAL AGE AND THE MEDIAN EDUCATIONAL AGE, BY CLASSES

ability levels. All former discussions gave this class the lowest rank. Now we find that although these children have a median Mental Age nine months below the norm, they have achieved one month better than their median ability.

The 7A class presents an interesting situation, too. Here we find that their median Mental Age and median Educational Age are exactly the same. That was true of their median Mental Age and median Chronological Age. This means that although each of these three medians is three months below the standard norm, these children have reached their physical age, mentally, and have reached their Mental Age, educationally.

The 7B and 8A classes perform, in this situation, very much as we expect. The 7B median Educational Age is one month above the median Mental Age. The 8A median Educational Age is two months below the median Mental Age. The 8A's have not accomplished as much educationally as they are able to accomplish.

Correlation of the Mental Ages and Educational Ages. The coefficients of correlation were found for the Mental Ages and the Educational Ages by the Pearson Product-Moment method. The following formula was used:

$$r = \frac{\Sigma xy - \frac{(\Sigma fd_x)(\Sigma fd_y)}{N}}{\sqrt{\Sigma fd^2_x - \frac{(\Sigma fd_x)^2}{N}}\sqrt{\Sigma fd^2_y - \frac{(\Sigma fd_y)^2}{N}}}$$

All coefficients of correlation are interpreted in terms of Ruch's point of view. Ruch says:

> When is a correlation "high" or "low?" There are as many answers as there are textbooks on statistics and measurement. The question is far too intricate for full discussion. Instead, we shall beg the issue by laying down dogmatic statements which will define the author's point of view for purposes of present interpretations.
>
> Correlations of 0.00-0.25 are insignificant.
> Correlations of 0.25-0.50 are low.
> Correlations of 0.50-0.80 are fairly significant.
> Correlations of 0.80-0.95 are fairly high.
> Correlations of 0.95-1.00 are high.[1]

Table IX, p. 48, gives the coefficients of correlation of the Mental and Educational Ages, by classes. The classes rank in the following order, from the highest to the lowest correlation: (1) 7B, .89; (2) 8A, .84; (3) 7A, .78; and (4) 8B, .74. These correlations show that the 7B class continues to be outstanding. There is much "going-togetherness" between its Mental Ages and its Educational Ages.

The former section of this report shows that the

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[1] G. M. Ruch, The Objective or New-Type Examination (Scott, Foresman and Company, 1929), p. 90.

TABLE IX

COEFFICIENTS OF CORRELATION OF THE MENTAL AGES AND EDUCATIONAL AGES, BY CLASSES

Classes	Coefficients of Correlation	Interpretations
7B	.89	Fairly high
7A	.78	Fairly significant
8B	.74	Fairly significant
8A	.84	Fairly high

8A median Educational Age is two months below their median Mental Age, but now we find quite a satisfactory degree of correlation between the two sets of scores.

The former section showed, too, that the 7A class, as a group, has reached its physical age, mentally, and its Mental Age, educationally. Now we find that their Mental Ages and Educational Ages do not "go together" as well as we might expect.

The 8B class has a median Educational Age one month better than the median Mental Age but has the least "going-togetherness" of Mental Ages and Educational Ages of any of the classes.

IV. RESULTS OF THE SEASHORE MUSICAL TALENT TESTS

The Seashore Musical Talent Tests were administered

for the purpose of finding the pupils' capacity in music as the Otis Mental Ability Test was used to find the pupils' general ability. Four talent tests were used--pitch, intensity, time, and tonal memory. All scores used in reporting the results of the Seashore Tests are centile scores as determined by the use of the tables in the Manual of Instructions and Interpretations.

This section of the report (1) shows the pupils' ranks on the Seashore scores, (2) gives the musical talent of the pupils as a group, (3) compares the Seashore medians with the standard average, by classes, and (4) correlates the musical talent average scores with the Intelligence Quotients.

Pupils' ranks on the Seashore Tests. Table X, p. 50, ranks the 78 musical talent scores. The first column of the table lists the average centile scores from the highest to the lowest. This arrangement determines the pupils' numbers which are used instead of names. The other columns of the table rank the scores for the individual tests. The number of the pupil who made a certain score is placed before the individual score. We find the pupils ranking differently, as a rule, on the different tests.

Tables XI, XII, and XIII, pp. 52-56, give similar information for the 7A's, 8B's, and 8A's, respectively.

TABLE X

RANKINGS OF THE 7B'S ON THE SEASHORE TESTS

Pupil	Average Score	Pitch		Intensity		Time		Tonal Memory	
		Pupil	Score	Pupil	Score	Pupil	Score	Pupil	Score
1	99	17	100	1	100	3	99	4	99
2	97	1	99	2	99	7	99	1	97
3	95	5	99	3	99	9	99	2	93
4	94	2	96	5	99	1	98	3	88
5	85	3	95	8	99	2	98	8	88
6	83	4	95	9	99	23	98	25	88
7	82	12	92	10	99	11	95	7	87
8	82	13	90	13	99	14	95	6	80
9	80	8	85	21	99	15	90	5	77
10	79	6	80	28	99	4	82	19	75
11	78	10	80	4	98	6	82	10	73
12	74	11	80	15	96	18	82	24	73
13	72	9	75	12	95	21	82	22	70
14	71	14	65	26	95	16	80	26	62
15	67	7	50	31	95	29	75	16	58
16	63	36	45	7	92	20	72	12	53
17	57	24	42	6	90	28	70	9	48
18	56	30	42	11	90	5	65	11	48
19	53	15	39	14	90	10	65	13	48
20	52	18	35	16	90	22	60	15	43
21	51	32	33	27	90	25	60	17	43
22	51	19	30	20	85	8	55	18	37
23	50	23	30	19	75	12	55	30	37
24	49	37	30	18	70	24	55	34	37
25	48	27	25	22	60	27	55	14	35
26	48	33	23	23	57	13	50	20	35
27	47	16	22	29	55	17	45	31	35
28	45	35	20	17	40	30	40	27	17
29	39	21	19	35	35	18	30	32	17
30	38	20	15	30	32	32	30	37	17
31	34	22	15	25	30	33	30	23	15
32	23	25	12	24	25	26	25	29	15
33	19	26	10	34	17	34	12	33	15
34	18	29	10	32	10	35	12	35	6
35	18	28	7	36	10	37	12	36	6

TABLE X (continued)

Pupil	Average Score	Pitch		Intensity		Time		Tonal Memory	
		Pupil	Score	Pupil	Score	Pupil	Score	Pupil	Score
36	17	34	6	37	8	36	7	38	4
37	17	31	4	38	8	31	2	21	3
38	4	38	3	33	7	38	2	28	3

TABLE XI

RANKINGS OF THE 7A'S ON THE SEASHORE TESTS

Pupil	Average Score	Pitch		Intensity		Time		Tonal Memory	
		Pupil	Score	Pupil	Score	Pupil	Score	Pupil	Score
1	91	12	19	1	99	40	99	2	97
2	89	13	99	8	99	52	99	5	97
3	88	6	96	12	99	27	95	3	90
4	86	10	96	34	99	30	95	35	90
5	85	11	95	53	99	28	95	1	85
6	85	48	95	4	96	6	92	19	83
7	84	1	90	5	96	7	92	17	80
8	82	29	90	9	96	15	92	4	77
9	81	7	86	16	96	11	92	32	77
10	81	2	85	18	86	18	92	37	77
11	81	4	85	22	96	22	92	7	73
12	81	31	85	25	96	46	92	8	73
13	80	3	77	20	95	1	91	11	73
14	79	9	77	21	95	2	91	13	73
15	79	16	77	24	95	21	91	14	73
16	77	8	77	27	95	29	91	16	73
17	76	22	77	41	95	3	90	43	70
18	75	26	77	42	95	9	90	50	70
19	73	15	75	3	93	14	90	60	70
20	73	24	75	14	93	4	85	12	65
21	72	36	75	43	90	10	85	9	62
22	72	23	70	38	90	17	85	15	62
23	71	5	65	35	90	25	85	20	62
24	71	33	65	6	90	26	85	6	62
25	70	14	60	10	90	36	85	18	58
26	70	20	60	23	90	41	85	25	58
27	69	21	57	32	90	5	82	45	58
28	68	17	55	39	90	23	82	28	54
29	67	18	55	30	85	34	82	10	53
30	66	19	50	65	85	57	82	30	53
31	66	27	50	19	85	8	80	51	53
32	64	39	50	40	85	19	75	61	53
33	63	44	49	44	85	20	75	31	48
34	61	45	45	2	83	13	72	49	48
35	61	38	45	7	83	59	72	53	48

TABLE XI (continued)

Pupil	Average Score	Pitch		Intensity		Time		Tonal Memory	
		Pupil	Score	Pupil	Score	Pupil	Score	Pupil	Score
36	60	51	45	17	83	39	70	58	48
37	60	37	42	28	83	24	70	21	43
38	59	25	42	33	83	33	70	23	43
39	59	28	40	47	83	58	70	24	43
40	57	50	40	54	83	42	70	42	43
41	57	32	35	26	80	47	70	54	37
42	57	34	35	49	80	31	65	64	37
43	56	41	35	56	80	38	65	38	37
44	52	43	35	13	75	51	65	26	37
45	52	46	32	46	75	12	60	27	37
46	51	30	32	29	70	16	60	33	35
47	51	63	30	37	70	50	60	44	30
48	51	35	28	11	65	55	60	34	26
49	51	49	26	31	65	32	55	39	26
50	51	47	24	45	65	37	50	40	26
51	49	62	24	48	57	49	50	47	26
52	45	54	23	62	57	44	45	48	26
53	43	53	23	36	55	45	40	59	26
54	40	55	20	55	50	56	40	22	23
55	38	66	20	52	40	35	35	36	23
56	34	65	20	50	35	43	30	52	23
57	34	64	19	57	35	48	27	55	23
58	31	52	18	51	32	61	27	63	17
59	30	42	18	63	30	64	20	29	15
60	26	40	18	65	30	54	17	65	15
61	26	61	15	60	27	62	15	41	12
62	25	56	7	59	17	66	12	57	12
63	22	60	7	64	12	63	10	56	8
64	22	57	6	66	10	65	7	46	4
65	18	59	3	61	7	53	2	66	3
66	11	58	2	58	3	60	1	62	2

TABLE XII

RANKINGS OF THE 8B'S ON THE SEASHORE TESTS

Pupil	Average Score	Pitch		Intensity		Time		Tonal Memory	
		Pupil	Score	Pupil	Score	Pupil	Score	Pupil	Score
1	98	1	100	3	100	3	100	2	99
2	95	3	100	4	99	6	99	1	96
3	95	2	99	7	99	1	99	31	93
4	94	8	99	35	99	4	99	4	93
5	90	6	99	8	99	7	99	7	93
6	90	13	99	6	99	21	99	11	87
7	88	18	99	21	96	39	99	3	78
8	88	5	96	20	96	28	96	12	75
9	87	27	96	1	96	19	96	16	73
10	84	9	92	13	96	8	96	10	73
11	81	48	88	5	95	5	96	5	73
12	80	4	85	3	92	10	96	9	73
13	75	11	85	23	92	13	96	44	68
14	74	17	85	10	92	7	95	22	63
15	70	12	80	22	92	2	90	6	63
16	69	15	80	36	92	14	90	15	63
17	63	10	75	15	92	39	89	26	57
18	63	20	70	2	90	36	85	25	57
19	61	7	65	29	90	17	85	8	57
20	60	14	65	27	90	12	83	28	53
21	59	24	60	30	90	23	83	14	53
22	59	35	55	24	85	32	80	19	47
23	58	37	50	14	85	30	80	17	47
24	57	16	47	9	85	26	80	33	44
25	56	29	47	19	85	41	80	24	44
26	55	32	43	40	85	34	75	18	44
27	54	47	43	43	85	22	75	48	44
28	53	34	32	23	80	16	75	32	38
29	53	21	31	16	80	25	75	49	37
30	52	45	30	11	80	46	75	23	35
31	52	31	30	12	80	45	70	40	35
32	51	42	25	18	80	42	70	45	30
33	51	30	22	25	75	11	70	37	30
34	50	23	20	26	75	37	60	27	27
35	50	32	22	49	65	40	55	20	27

TABLE XII (continued)

Pupil	Average Score	Pitch		Intensity		Time		Tonal Memory	
		Pupil	Score	Pupil	Score	Pupil	Score	Pupil	Score
36	49	39	22	32	65	43	55	34	27
37	48	41	20	34	65	47	45	28	22
38	45	46	20	39	55	15	45	42	19
39	45	19	17	31	55	20	45	47	17
40	44	25	17	38	55	44	40	41	17
41	43	44	17	41	55	24	40	30	17
42	42	50	17	42	55	35	40	51	17
43	42	43	14	37	50	52	35	43	13
44	41	28	14	50	50	18	30	38	13
45	37	52	11	46	45	31	30	52	11
46	37	38	11	51	45	33	26	36	10
47	34	36	10	44	40	29	20	21	18
48	33	26	8	17	35	50	18	21	8
49	29	49	7	47	30	51	8	46	8
50	22	51	7	45	17	49	5	50	4
51	19	22	6	52	2	27	4	35	4
52	15	40	2	48	0	48	0	39	4

TABLE XIII

RANKINGS OF THE 8A'S ON THE SEASHORE TESTS

Pupil	Average Score	Pitch		Intensity		Time		Tonal Memory	
		Pupil	Score	Pupil	Score	Pupil	Score	Pupil	Score
1	99	1	99	2	100	1	99	1	99
2	99	2	99	1	99	2	99	4	99
3	98	7	99	3	99	3	99	35	99
4	97	3	96	4	99	4	99	2	98
5	95	4	92	6	99	5	99	3	98
6	95	38	92	11	99	6	99	5	98
7	94	36	92	8	99	8	99	8	96
8	92	32	92	27	99	14	99	16	96
9	90	9	92	37	99	18	99	20	96
10	89	5	90	25	96	27	99	21	96
11	88	16	90	26	96	57	99	28	96
12	86	25	88	24	96	11	97	7	93
13	86	30	88	14	96	50	97	19	93
14	85	6	88	25	96	23	97	6	92
15	83	11	88	10	96	58	97	9	92
16	82	12	85	24	96	7	96	12	92
17	80	13	85	28	96	49	96	32	92
18	78	10	80	31	96	19	95	7	90
19	75	22	80	35	96	10	91	36	90
20	74	8	75	48	96	12	91	38	90
21	73	18	75	54	96	45	91	10	87
22	73	23	75	62	96	15	90	13	87
23	73	31	75	25	96	29	90	11	86
24	71	37	75	46	95	41	90	34	85
25	70	40	75	63	95	54	90	15	85
26	69	14	70	16	95	9	85	39	85
27	69	19	70	17	95	59	85	43	85
28	69	15	65	9	92	24	85	51	85
29	69	29	65	18	92	47	85	22	78
30	68	68	65	33	92	52	83	26	78
31	66	57	60	13	92	60	83	14	75
32	65	41	60	5	92	61	83	27	72
33	65	21	55	40	90	13	80	47	68
34	65	33	55	40	90	17	80	37	63
35	64	44	55	52	90	46	80	42	63

TABLE XIII (continued)

Pupil	Average Score	Pitch		Intensity		Time		Tonal Memory	
		Pupil	Score	Pupil	Score	Pupil	Score	Pupil	Score
36	64	67	50	53	90	55	80	24	63
37	64	17	50	7	90	20	75	66	57
38	64	26	47	15	90	30	75	59	53
39	63	43	45	42	85	48	75	33	53
40	63	55	43	34	85	65	75	40	53
41	62	20	40	23	85	22	70	45	47
42	61	24	40	21	85	31	70	55	47
43	60	28	35	20	85	43	70	18	45
44	57	35	35	69	85	64	70	25	44
45	56	41	32	39	80	70	70	29	44
46	56	45	32	12	75	34	65	44	44
47	55	47	32	30	75	42	65	56	44
48	54	35	31	56	65	44	65	53	38
49	54	58	26	44	65	33	60	60	37
50	53	56	25	22	65	39	60	30	35
51	53	39	25	32	65	53	60	46	35
52	51	34	25	45	55	21	55	23	35
53	50	50	22	61	50	26	55	65	35
54	48	49	18	73	50	56	55	48	30
55	47	52	18	58	45	25	50	49	26
56	47	72	16	19	40	28	50	72	22
57	47	46	15	43	40	36	50	50	22
58	45	66	15	51	40	38	50	67	22
59	44	70	15	47	35	51	50	31	22
60	40	48	14	59	35	16	45	64	22
61	39	64	14	64	35	71	45	73	19
62	37	53	10	60	32	63	40	62	17
63	36	65	10	66	32	40	35	71	17
64	35	61	8	71	32	35	30	68	13
65	33	62	8	72	32	62	26	61	13
66	29	60	8	57	23	67	20	58	13
67	28	69	8	36	25	68	20	52	13
68	27	73	6	38	25	37	18	70	10
69	25	27	6	67	20	32	12	41	8
70	25	74	5	55	18	72	12	63	6

TABLE XIII (continued)

Pupil	Average Score	Pitch		Intensity		Time		Tonal Memory	
		Pupil	Score	Pupil	Score	Pupil	Score	Pupil	Score
71	25	71	5	68	11	66	10	57	4
72	21	63	3	65	10	69	5	74	3
73	20	59	3	70	6	74	5	54	3
74	5	54	3	74	5	73	3	69	2

In a later section of the report, profiles will be made of certain individual cases. These profiles will show the pupils' standings on all of the tests administered.

Musical talent of the pupils, as a group. Table XIV groups the average Seashore centile scores at twelve different ability levels. Figure 8, p. 60, is a histogram which represents these twelve different ability levels,

TABLE XIV

AVERAGE SEASHORE CENTILE SCORES AT TWELVE DIFFERENT ABILITY LEVELS

Ability Levels	Number of Cases
92-99	17
84-91	18
76-83	22
68-75	31
60-67	28
52-59	31
44-51	32
36-43	16
28-35	12
20-27	12
12-19	8
4-11	3
Total	230

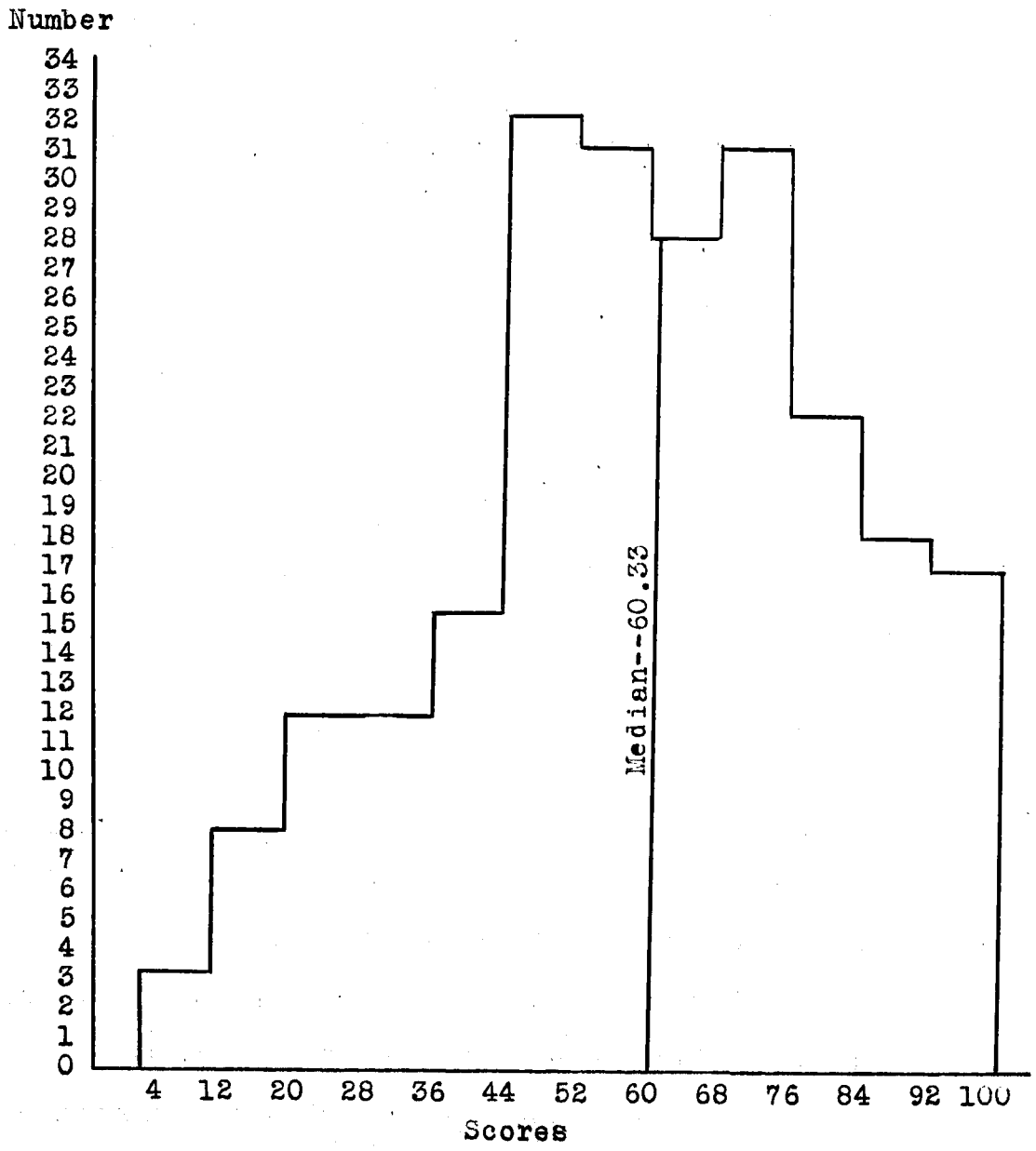

FIGURE 8

HISTOGRAM OF THE MUSICAL TALENT OF THE ENTIRE GROUP, BASED ON AVERAGE SEASHORE CENTILES

graphically. This histogram does not show a normal curve. There are about three and one-half times as many cases at and above forty-four as below forty-four. The steps at the lower end of the distribution rise gradually until a score of forty-four is reached. Then the peak of the distribution is reached immediately with thirty-two cases between forty-four and fifty-one, inclusive. There is an irregularity at the sixty to sexty-seven level. The downward slope at the upper end of the distribution stops with seventeen cases at the ninety-two to ninety-nine level and drops immediately to the base line. The median is 60.33 which is 10.33 above the standard average score of fifty.

Comparison of the Seashore medians with the standard average, by classes. Table XV, p. 62, gives the highest and lowest scores, the quartiles, the median scores, the standard average, and the quartile deviations, by classes, for each test and for the average of the four tests.

We find that the quartile deviations for pitch may be ranked in the following order, from the largest to the smallest quartile deviation, by classes: (1) 8B, 32.8; (2) 7B, 30.9; (3) 8A, 30.5; and (4) 7A, 25.0; for intensity, (1) 7B, 29.6; (2) 8A, 27.1; (3) 8B, 18.2; and (4) 7A, 15.4; for time, (1) 7B, 29.1; (2) 8B, 25.4; (3) 8A, 21.7; (4) 7A, 20.7; for tonal memory, (1) 8A, 31.1; (2) 7B, 28.8; (3) 8B,

TABLE XV

HIGHEST AND LOWEST SCORES, QUARTILES, MEDIANS, STANDARD AVERAGE, AND QUARTILE DEVIATIONS FOR THE SEASHORE MUSICAL TALENT TESTS FOR EACH CLASS AND FOR THE ENTIRE GROUP

Classes	Highest Score	Lowest Score	Q^3	Median Score	Standard Average	Q^1	Q
			Pitch				
7B	100	3	78.8	37.7	50	18.0	30.9
7A	99	2	76.0	46.6	50	26.0	25.0
8B	100	2	83.5	43.0	50	18.0	32.8
8A	99	3	79.1	47.0	50	18.2	30.5
Entire Group	100	2	78.7	44.5	50	19.9	29.4
			Intensity				
7B	100	7	95.1	86.0	50	36.0	29.6
7A	99	3	92.8	84.5	50	62.0	15.4
8B	100	1	93.4	82.0	50	57.0	18.2
8A	100	5	94.6	84.3	50	40.5	27.1
Entire Group	100	1	94.0	84.1	50	52.3	20.9
			Time				
7B	99	2	88.0	61.0	50	29.8	29.1
7A	99	1	90.6	75.0	50	49.3	20.7
8B	100	1	91.7	75.4	50	41.0	25.4
8A	99	3	92.2	74.8	50	48.9	21.7
Entire Group	100	1	91.3	73.4	50	45.3	23.0
			Tonal Memory				
7B	99	3	76.0	45.0	50	18.5	28.8
7A	97	2	70.4	49.8	50	27.8	21.3
8B	99	4	68.5	42.7	50	18.5	25.0
8A	99	2	89.6	58.5	50	27.4	31.1
Entire Group	99	2	76.8	48.7	50	24.5	26.2
			Average				
7B	99	4	78.5	56.0	50	39.3	19.6
7A	91	11	77.3	62.8	50	54.3	11.5
8B	98	15	74.3	56.0	50	45.6	14.4
8A	99	5	77.9	63.8	50	46.0	16.0
Entire Group	99	4	77.4	60.3	50	45.3	16.1

25.0; and (4) 7A, 21.3; for average scores, (1) 7B, 19.6; (2) 8A, 16.0; (3) 8B, 14.4; and (4) 7A, 11.5.

Figure 9, p. 64, shows graphically, the relationship between the medians and the standard average, by tests and by classes. In all cases, the standard average is fifty. This is represented by a solid horizontal line across the middle of the figure. The medians for the classes are represented by the broken lines.

Figure 10, p. 65, shows the relationship between the medians of the entire group and the standard average, by tests. Figures 9 and 10 should be studied together.

We find that pitch was the most difficult for the entire group and for the individual classes. No median reached the standard average. The classes rank in the following manner, from the highest to the lowest median: (1) 8A, 47.0; (2) 7A, 46.6; (3) 8B, 43.0; and (4) 7B, 37.7. The median of the entire group, for pitch, is 44.5.

The next most difficult test was tonal memory. In this case, one median--the 8A--was 8.5 above the standard average. The classes rank in the following order, from the highest to the lowest median: (1) 8A, 58.5; (2) 7A, 49.8; (3) 7B, 45.0; and (4) 8B, 42.7. The median of the entire group, for tonal memory, is 48.7.

The easiest test was intensity. Here, all medians

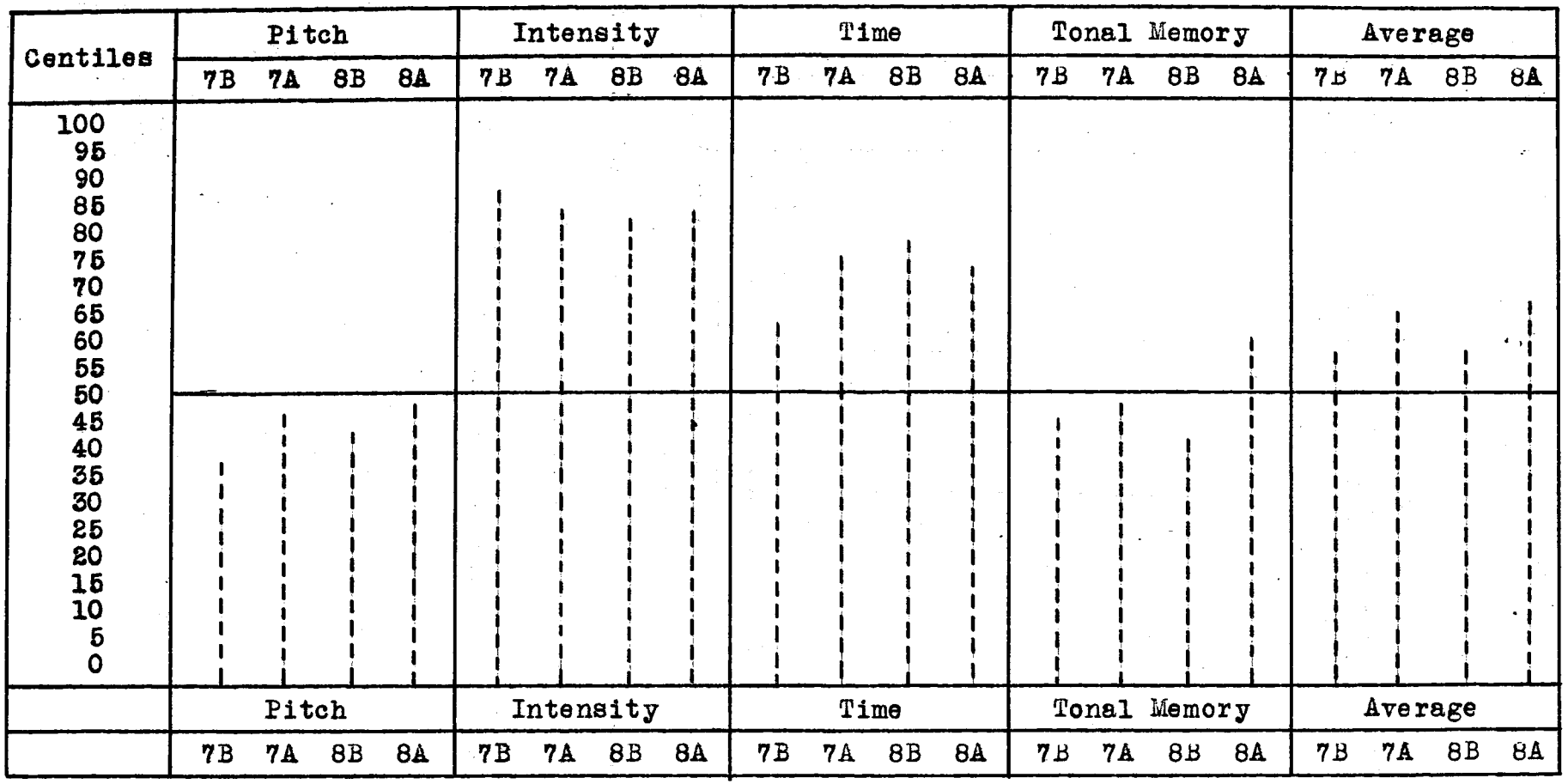

FIGURE 9

COMPARISON OF THE SEASHORE MEDIANS AND THE STANDARD AVERAGE, BY TESTS AND BY CLASSES

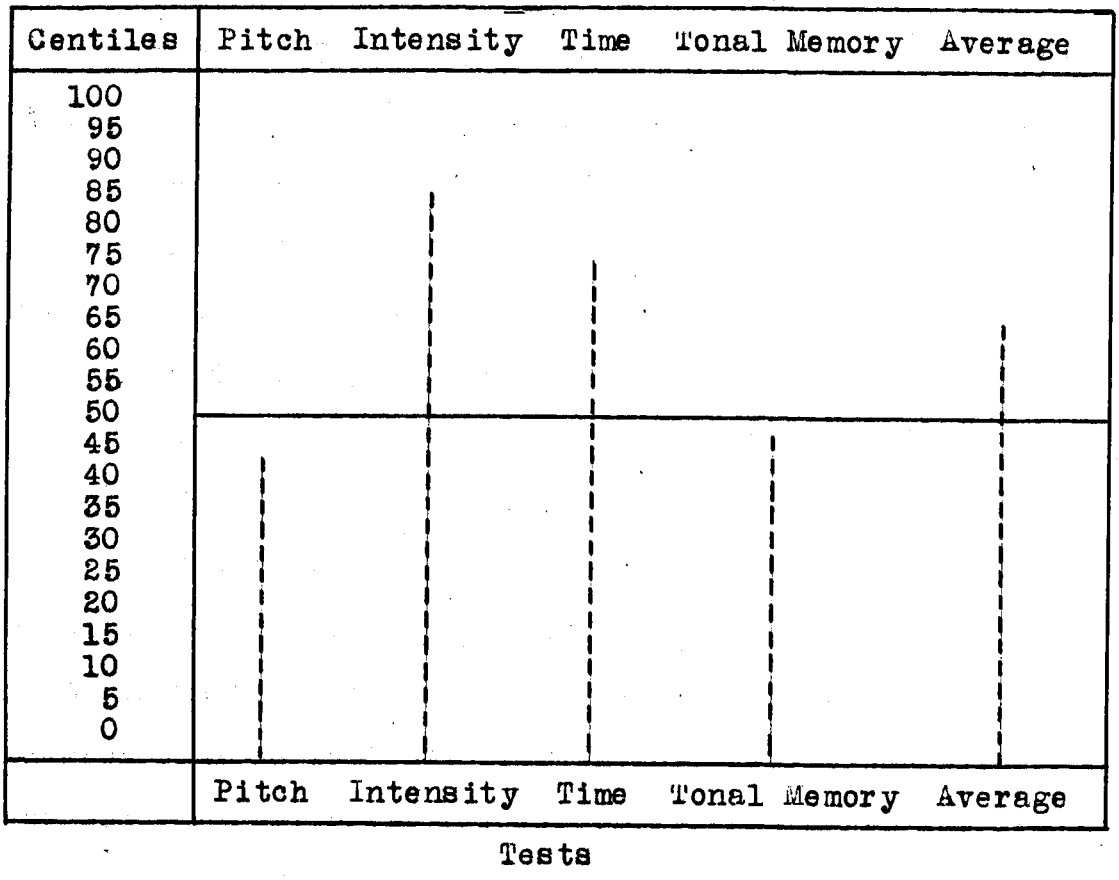

FIGURE 10

COMPARISON OF THE SEASHORE MEDIANS OF THE ENTIRE GROUP AND THE STANDARD AVERAGE, BY TESTS

are far above the standard average and the median for the entire group is 84.1. The classes rank in the following order, from the highest to the lowest median: (1) 7B, 86.0; (2) 7A, 84.5; (3) 8A, 84.3; and (4) 8B, 82.0.

The second easiest test was time. All medians are above the standard average. The median for the entire group is 73.4. The classes rank in the following manner, from the highest to the lowest median: (1) 8B, 75.4; (2) 7A, 75.0; (3) 8A, 74.8; and (4) 7B, 61.0.

The medians of the average Seashore scores are shown, by classes, in the last column of Figure 9. Here we find that all medians are above the standard average. The classes rank as follows, from the highest to the lowest median: (1) 8A, 63.8; (2) 7A, 62.8; and (3) 7B and 8B, 56.0.

The last column of Figure 10 shows that the average musical talent of the entire group is 10.3 above the standard average.

Several interesting situations are revealed in a study of the facts presented in this section of the report.

The group, as a whole, is slightly above average on musical talent, considering the average scores for the four tests.

The 7B class, which has the highest median Intelligence

Quotient of the entire group--100--has an average musical talent median 6.0 higher than the standard average, but ranked at the top on only one individual test--intensity.

The 8B class, which has the lowest median Intelligence Quotient of the entire group--94.2--now has exactly the same average musical talent median as the 7B's. And, too, the 8B's have the highest median on one individual test--time.

The 7A and 8A classes have median Intelligence Quotients of 99.3 and 99.9, respectively. Now we find that they have medians of musical talent averages 12.8 and 13.8, respectively, above the standard average.

Correlation of the musical talent average scores and the Intelligence Quotients. Table XVI, p. 68, gives the coefficients of correlation for the musical talent average scores and the Intelligence Quotients, with Ruch's[2] interpretations.

The classes rank in the following order from the highest to the lowest correlation: (1) 7B, .82; (2) 8A, .58; (3) 8B, .52; and (4) 7A, .14. Only one of these coefficients of correlation--the 7B's--is at all comparable with those for the Mental Ages and the Educational Ages

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[2] Loc. cit.

TABLE XVI

COEFFICIENTS OF CORRELATION OF THE MUSICAL TALENT AVERAGE SCORES AND THE INTELLIGENCE QUOTIENTS, BY CLASSES

Classes	Coefficients of Correlation	Interpretations
7B	.82	Fairly high
7A	.14	Insignificant
8B	.52	Fairly significant
8A	.58	Fairly significant

shown on p. 48 of this report. The 8B's and 8A's show a fairly significant degree of "going-togetherness" of these two types of ability, and the 7A's show an insignificant degree. Perhaps these relationships may be explained, in part, by the fact that musical talent is a very specialized type of ability. Many children who have much general ability have no musical talent. Likewise, many who have little general ability do have musical talent.

Jacob Kwalwasser[3] says that we are not justified in expecting a positive relationship between intelligence and

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[3] Jacob Kwalwasser, "The Appreciation Arts--Music," The Implications of Research for the Classroom Teacher (Washington, D. C.: National Education Association of the United States, 1939), pp. 256-257.

musical ability, that such correlations are likely to fall below +.20, and that general intelligence is the power to solve problems of a general nature in everyday life, while musical ability covers only the power to solve problems in the field of music.

V. RESULTS OF THE KNUTH ACHIEVEMENT TESTS IN MUSIC

The Knuth Achievement Tests in Music were administered to test recognition of certain rhythmic and melodic aspects of music. This section of the report of the findings (1) compares the medians of the Knuth achievement scores and the standard norms, by classes, and for the entire group, (2) correlates the Knuth achievement scores and the Seashore musical talent scores, and (3) correlates the Knuth achievement scores and the Educational Ages.

Comparison of the Knuth medians and the standard norms, by classes, and for the entire group. Table XVII, p. 70, gives the highest and lowest scores, the quartiles, the medians, the standard norms, and the quartile deviations for the four classes and for the entire group. Figure 11, p. 71, compares, graphically, the Knuth medians and the standard norms.

The Manual of Directions for the Knuth Tests lists the seventh grade median or standard norm as 8.7, and the

TABLE XVII

HIGHEST AND LOWEST SCORES, QUARTILES, MEDIAN, STANDARD NORM, AND QUARTILE DEVIATION FOR THE KNUTH ACHIEVEMENT TEST FOR EACH CLASS AND FOR THE ENTIRE GROUP

Classes	Highest Score	Lowest Score	Q^3	Median Score	Standard Norm	Q^1	Q
7B	15	0	7.5	4.8	8.7	1.7	2.9
7A	23	0	9.3	5.2	8.7	2.4	3.5
8B	24	0	8.7	4.0	12.7	1.4	3.7
8A	24	0	15.7	5.4	12.7	1.7	7.0
Entire Group	24	0	9.8	4.9	10.7	1.7	4.1

eighth grade median or standard norm as 12.7.

The classes used in this study are organized with "B" and "A" sections. Since only one standard norm is listed for the seventh grade, that norm is used for both 7B and 7A. Likewise, the 8B and 8A classes have the same standard norm. The writer used the average of these two standard norms as the standard norm for the entire group of both grades.

We find from Table XVII that the classes rank in the following order, from the highest to the lowest median: (1) 8A, 5.4; (2) 7A, 5.2; (3) 7B, 4.8; and (4) 8B, 4.0.

Figure 11, p. 71, shows that no class median reached

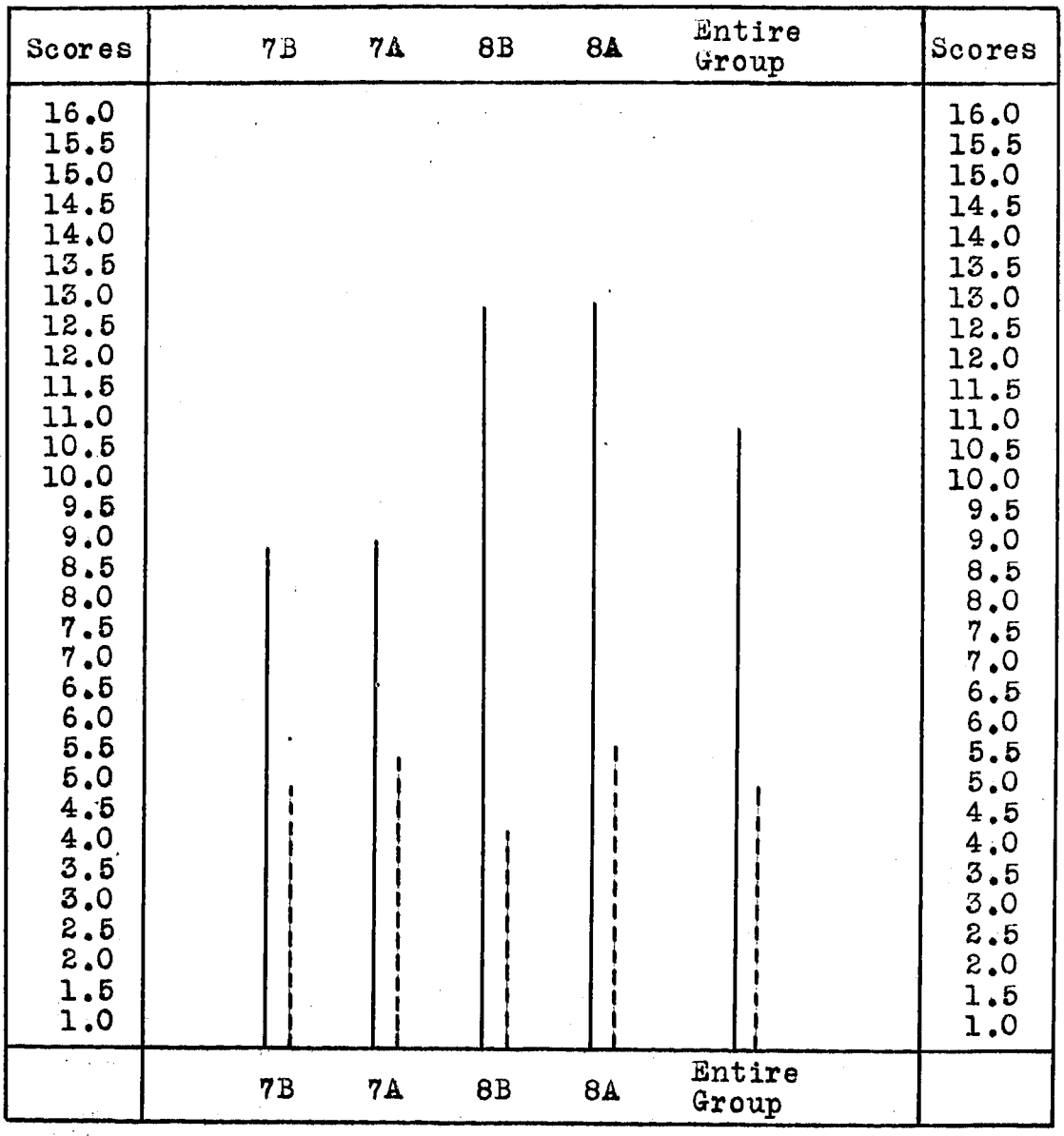

FIGURE 11

COMPARISON OF THE KNUTH MEDIANS AND THE STANDARD NORMS, BY CLASSES AND FOR THE ENTIRE GROUP

the standard norm. They are far below, showing that these tests were very difficult for the children. The writer feels that these tests do not measure the type of music that is taught in the public schools and that they are more suitable for measuring the achievement of children who have had special instrumental training. A later section of this report is devoted to comparisons of the medians of the children who have had special music training and those who have not had such special training.

Correlation of the Knuth achievement scores and the Seashore average musical talent scores. Table XVIII, p. 73, gives the coefficients of correlation for the Knuth achievement and Seashore musical talent, by classes, with Ruch's[4] interpretations.

The classes rank in the following order, from the highest to the lowest correlation: (1) 8B, .63; (2) 8A, .55; (3) 7B, .48; and (4) 7A, .31.

It is interesting to find that although the 8B class has the lowest Knuth median and tied with the 7B's for the lowest median Seashore average, it has the highest correlation of any class on musical talent and Knuth achievement.

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[4] G. M. Ruch, op. cit.

TABLE XVIII

COEFFICIENTS OF CORRELATION OF THE KNUTH ACHIEVEMENT SCORES AND THE SEASHORE AVERAGE SCORES

Classes	Coefficients of Correlation	Interpretations
7B	.48	Low
7A	.31	Low
8B	.63	Fairly significant
8A	.55	Fairly significant

The 8A class ranks second on all correlations discussed so far in this report. The 7B's ranked first on Mental Age and Educational Age and Seashore and Intelligence Quotient correlations, but now rank third on Knuth and Seashore with a low correlation of .48. The 7A class has a low correlation of .31 here and ranked third and fourth on the two former correlations.

Correlation of the Knuth achievement scores and the Educational Ages. Table XIX, p. 74, gives the coefficients of correlation for the Knuth achievement scores and the Educational Ages, by classes. These classes rank in the following order, from the highest to the lowest correlation: (1) 8B, .44; (2) 7B, .42; (3) 8A, .33; and (4) 7A, -.02.

TABLE XIX

COEFFICIENTS OF CORRELATION OF THE KNUTH ACHIEVEMENT SCORES AND THE EDUCATIONAL AGES, BY CLASSES

Classes	Coefficients of Correlation	Interpretations
7B	.42	Low
7A	-.02	Negative
8B	.44	Low
8A	.33	Low

We find here the first and only negative correlation in this study--the 7A's -.02. The other three classes show low correlations.

We find the 8B class again having the highest coefficient of correlation for the entire group. This class, at times, gives a very good account of itself, considering its low median Intelligence Quotient--94.2.

VI. RESULTS OF THE KWALWASSER-RUCH TEST OF MUSICAL ACCOMPLISHMENT

The Kwalwasser-Ruch Test of Musical Accomplishment was administered to measure accomplishment along the lines of instruction in music in the public schools. This section of the report (1) compares the Kwalwasser-Ruch medians with

the standard norms, (2) correlates the Kwalwasser-Ruch scores and the Seashore scores, and (3) correlates the Kwalwasser-Ruch scores and the Educational Ages.

Comparison of the Kwalwasser-Ruch medians and the standard norms. Table XX, p. 76, gives the highest and lowest scores, the quartiles, the medians, the standard norms, and the quartile deviations for the Kwalwasser-Ruch Test of Musical Accomplishment, by classes, and for the entire group.

The standard norms are taken from p. 6 of the Manual of Directions for this test. We have here a situation similar to that of the Knuth standard norms. The seventh grade norm is 106 and the eighth grade norm is 127. The former is used in this study for both the 7B and 7A classes; the latter, for both the 8B and 8A classes. The average of the two is used as the norm for the entire group of both grades.

Figure 12, p. 77, is a graphic representation of the relationship between the medians and the standard norms, by classes, and for the entire group.

The 7B median is 2.5 above the norm and the 7A median is 18.8 above the norm. Here, the 7A's show outstanding achievement.

TABLE XX

HIGHEST AND LOWEST SCORES, QUARTILES, MEDIAN, STANDARD NORM, AND QUARTILE DEVIATION FOR THE KWALWASSER-RUCH ACHIEVEMENT TEST FOR EACH CLASS AND FOR THE ENTIRE GROUP

Classes	Highest Score	Lowest Score	Q^3	Median Score	Standard Norm	Q^1	Q
7B	183	15	156.0	108.5	106.0	76.0	40.0
7A	223	37	152.7	124.8	106.0	93.1	29.8
8B	216	45	129.8	112.4	127.0	71.0	29.4
8A	229	27	141.8	122.4	127.0	79.1	31.4
Entire Group	229	15	146.3	118.1	116.5	81.3	32.5

The 8B median is 14.6 below the norm and the 8A median is 4.6 below the norm, which is not a serious "minus" difference. The median for the entire group is 1.6 above the norm.

The achievement shown on this test is much greater than that shown on the Knuth test. The writer feels that this test is a better measure of the type of music taught in the public schools.

Correlation of the Kwalwasser-Ruch scores and the Seashore scores. Table XXI, p. 78, gives the coefficients of correlation for the Kwalwasser-Ruch scores and the

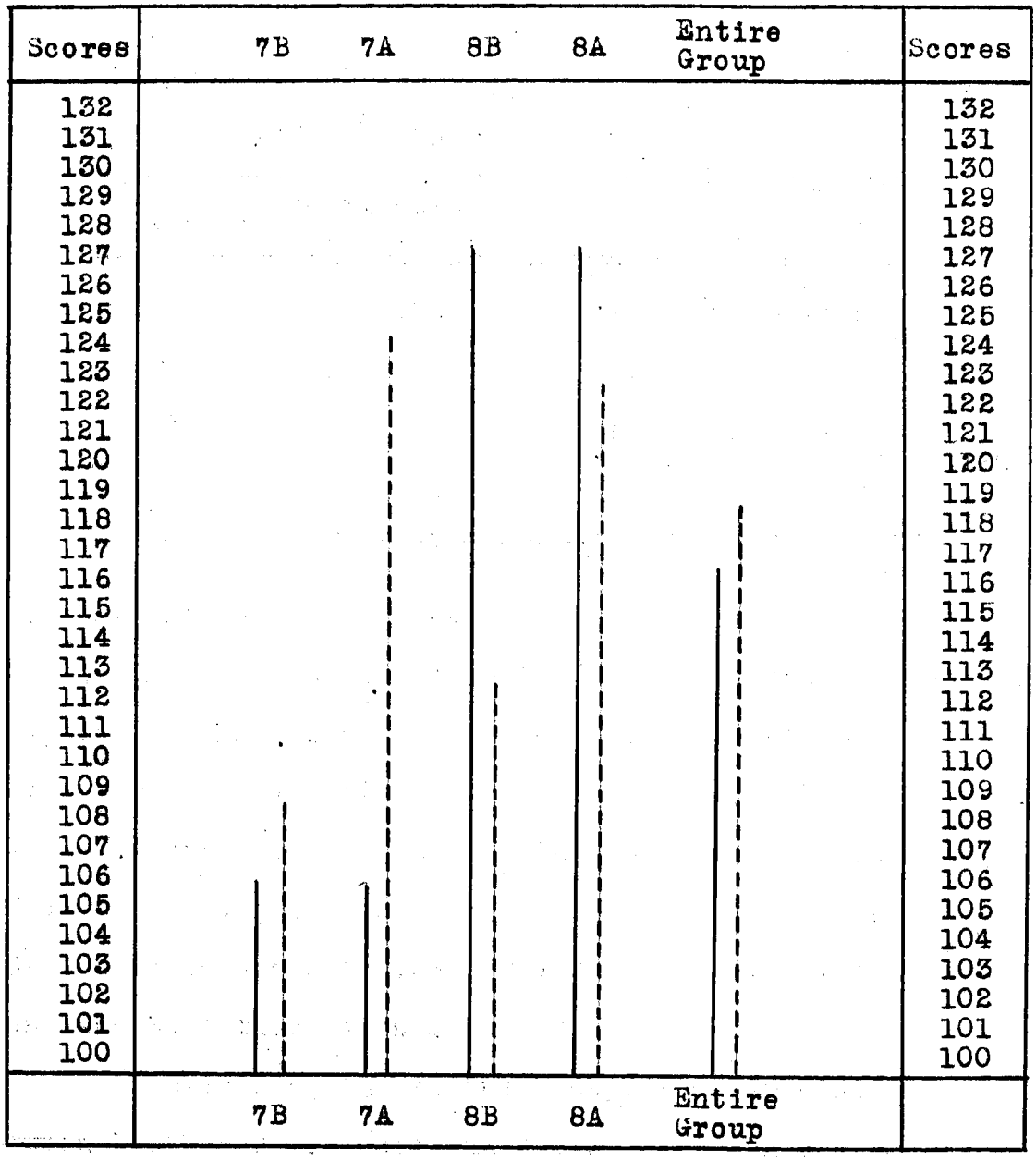


FIGURE 12

COMPARISON OF THE KWALWASSER-RUCH MEDIANS AND THE STANDARD NORMS, BY CLASSES AND FOR THE ENTIRE GROUP

TABLE XXI

COEFFICIENTS OF CORRELATION FOR THE KWALWASSER-RUCH ACHIEVEMENT SCORES AND THE SEASHORE MUSICAL TALENT SCORES, BY CLASSES

Classes	Coefficients of Correlation	Interpretations
7B	.72	Fairly significant
7A	.21	Insignificant
8B	.54	Fairly significant
8A	.52	Fairly significant

Seashore scores, by classes.

These classes rank in the following order, from the highest to the lowest coefficient of correlation: (1) 7B, .72; (2) 8B, .54; (3) 8A, .52; and (4) 7A, .21.

Again, we find the 7A class with the lowest coefficient of correlation--.21--which is insignificant. The 8B's rank second with .54. The 7B's rank first with .72 and the 8A's third with .52.

Considering the entire group, the correlations between Knuth and Seashore and Kwalwasser-Ruch and Seashore average have practically the same degree of "going-togetherness."

A study of these two correlations and of the correlation of Mental Ages and Educational Ages shows that the

former are much lower than the latter. This means that these children's musical talent and music achievement do not go together as well as their general ability and general achievement. The former correlation is "fairly significant" and the latter is "fairly high."

Correlation of the Kwalwasser-Ruch scores and the Educational Ages. Table XXII, p. 80, gives the coefficients of correlation for the Kwalwasser-Ruch scores and the Educational Ages. Here, the classes rank in the following order, from the highest to the lowest coefficient of correlation: (1) 7B, .68; (2) 8A, .61; (3) 8B, .44; and 7A, .32.

Two of these coefficients of correlation are low and two only fairly significant. The 7B's rank first, and the 7A's last. The 7A's have ranked last in all correlations except one--Mental Age and Educational Age on which they ranked third. "Figures talk" in a statistical study, but teachers who know this class, already recognize the fact that the class presents many problems. We consider it a "capable" class, but we feel certain that very few of the children measure up to their ability--there are few well-balanced individuals in the class. A figure showing the correlation of any two sets of scores would show most of the connecting lines between the pairs of scores for the

TABLE XXII

COEFFICIENTS OF CORRELATION FOR THE KWALWASSER-RUCH ACHIEVEMENT SCORES AND THE EDUCATIONAL AGES, BY CLASSES

Classes	Coefficients of Correlation	Interpretations
7B	.68	Fairly significant
7A	.32	Low
8B	.44	Low
8A	.61	Fairly significant

individual pupils rising or falling at acute angles of varying degrees. Only a few would extend straight across the figure or would form an obtuse angle.

Considering the entire group, the degree of correlation between Kwalwasser-Ruch and Educational Ages is much greater than that between Knuth and Educational Ages.

Summarizing the six correlations presented in this study and considering the entire group, we find that they rank in the following order, from the highest to the lowest average coefficient of correlation:

(1) Mental Age and Educational Age 81

(2) Seashore and Intelligence Quotient 52

(3) Kwalwasser-Ruch and Educational Age 51

(4) Kwalwasser-Ruch and Seashore 50

(5) Knuth and Seashore 49

(6) Knuth and Educational Age 29

VII. THE EFFECT OF SPECIAL MUSIC TRAINING ON THE PUPILS' SCORES ON THE MUSIC TESTS

It seemed desirable to find the effect of special music training on the pupils' scores on the music tests. Table XXIII, p. 82, lists the pupils with special music training, by classes, and by pupils' numbers instead of names. The table includes, also, the pupils' scores on the musical talent test and on the two achievement tests. The forty-one children listed here have had at least one year's training on a recognized instrument that requires reading of musical score.

The scores of these forty-one children were tabulated and the medians were found. Similar procedure was used for the remaining 189.

Table XXIV, p. 83, gives the medians for the group with special training and for the group without special training.

The results in this part of the study show that the pupils with special music training have higher medians on the musical talent test and on both music achievement tests than the pupils without special music training have.

TABLE XXIII

FORTY-ONE PUPILS WITH SPECIAL MUSIC TRAINING AND THEIR SCORES ON THE MUSIC TESTS

Class	Pupil's Number	Average Seashore	Knuth	Kwalwasser-Ruch
7B	1	99	15	157
7B	8	82	13	175
7B	36	17	0	154
7A	1	91	15	198
7A	4	86	0	160
7A	5	85	20	175
7A	9	81	5	139
7A	10	81	16	167
7A	11	81	12	207
7A	12	81	23	215
7A	14	79	11	78
7A	16	77	7	144
7A	18	75	7	189
7A	19	73	3	87
7A	20	73	7	98
7A	31	66	12	223
7A	35	61	11	223
7A	37	60	3	127
7A	44	52	7	138
7A	50	51	5	107
8B	1	98	1	122
8B	3	95	12	216
8B	5	90	19	166
8B	7	88	23	198
8B	11	81	19	139
8B	22	59	3	205
8B	32	51	5	169
8B	35	50	3	116
8A	1	99	9	184
8A	3	98	24	158
8A	4	97	24	229
8A	6	95	19	179
8A	7	94	17	123
8A	9	90	21	175
8A	12	86	23	139

TABLE XXIII (continued)

Class	Pupil's Number	Average Seashore	Knuth	Kwalwasser-Ruch
8A	17	80	17	165
8A	26	69	15	195
8A	34	65	4	124
8A	43	60	3	146
8A	44	57	17	113
8A	67	28	4	94

TABLE XXIV

MEDIANS FOR PUPILS WITH SPECIAL MUSIC TRAINING AND FOR PUPILS WITHOUT SPECIAL MUSIC TRAINING

Tests	Medians	
	With Special Training	Without Special Training
Seashore	81.4	57.5
Knuth	12.3	4.4
Kwalwasser-Ruch	159.8	108.1

VIII. PROFILES OF SIX CASES FROM THE ENTIRE GROUP

The purpose of this section of the report is to present, graphically, the standings of six children on all of the tests administered. The writer chose two children near the top of the distribution for the Seashore average scores, two at the bottom, and two at the median. It seemed that this sampling would present a general idea of pupils' ranks on the different types of tests with the Seashore musical talent test used as the basis of selection.

The profile method of graphic representation is used. In order to make the profiles, it was necessary to translate all test scores into a common unit of measure--standard scores. The means and standard deviations were found for all sets of scores. The following formula was used in finding the standard scores:

$$\frac{\text{Score} - M}{\sigma}$$

Table XXV, p. 85, gives the means and standard deviations used. Table XXVI, p. 86, gives the numbers of the children, their classes, and their actual scores on the various tests, and Table XXVII, p. 87, gives their standard scores which are used in the profiles.

Figures 13 and 14, pp. 88 and 89, show the standings of the six children on the various tests.

Table XXV

MEANS AND STANDARD DEVIATIONS FOR NINE MEASURES OF ABILITY AND ACHIEVEMENT FOR THE ENTIRE GROUP

Measures of Ability and Achievement	Means	Standard Deviations
Mental Ages	13-2	21.28
Educational Ages	13-4	10.62
Seashore Average	59.5	22.3
Pitch	48.3	31.4
Intensity	71.0	32.0
Time	65.0	30.9
Tonal Memory	50.1	29.6
Knuth	2.7	6.46
Kwalwasser-Ruch	116.2	46.3

TABLE XXVI

SIX CHILDREN USED IN THE PROFILES, THEIR CLASSES, AND THEIR ACTUAL SCORES ON THE NINE TESTS

Measures of Ability and Achievement	Pupils--Classes and Numbers					
	High		Average		Low	
	7B-1*	8A-4	8B-34	7B-23	7B-38	8A-74
Mental Ages	15-0	17-4	13-10	12-2	12-2	10-0
Educational Ages	13-7	14-10	12-8	13-1	12-3	12-4
Seashore Average	99	97	50	50	4	5
Pitch	99	92	32	30	3	5
Intensity	100	99	65	57	8	5
Time	98	99	75	98	2	5
Tonal Memory	97	99	27	15	4	3
Knuth	15	24	5	4	4	0
Kwalwasser-Ruch	157	229	160	118	67	72

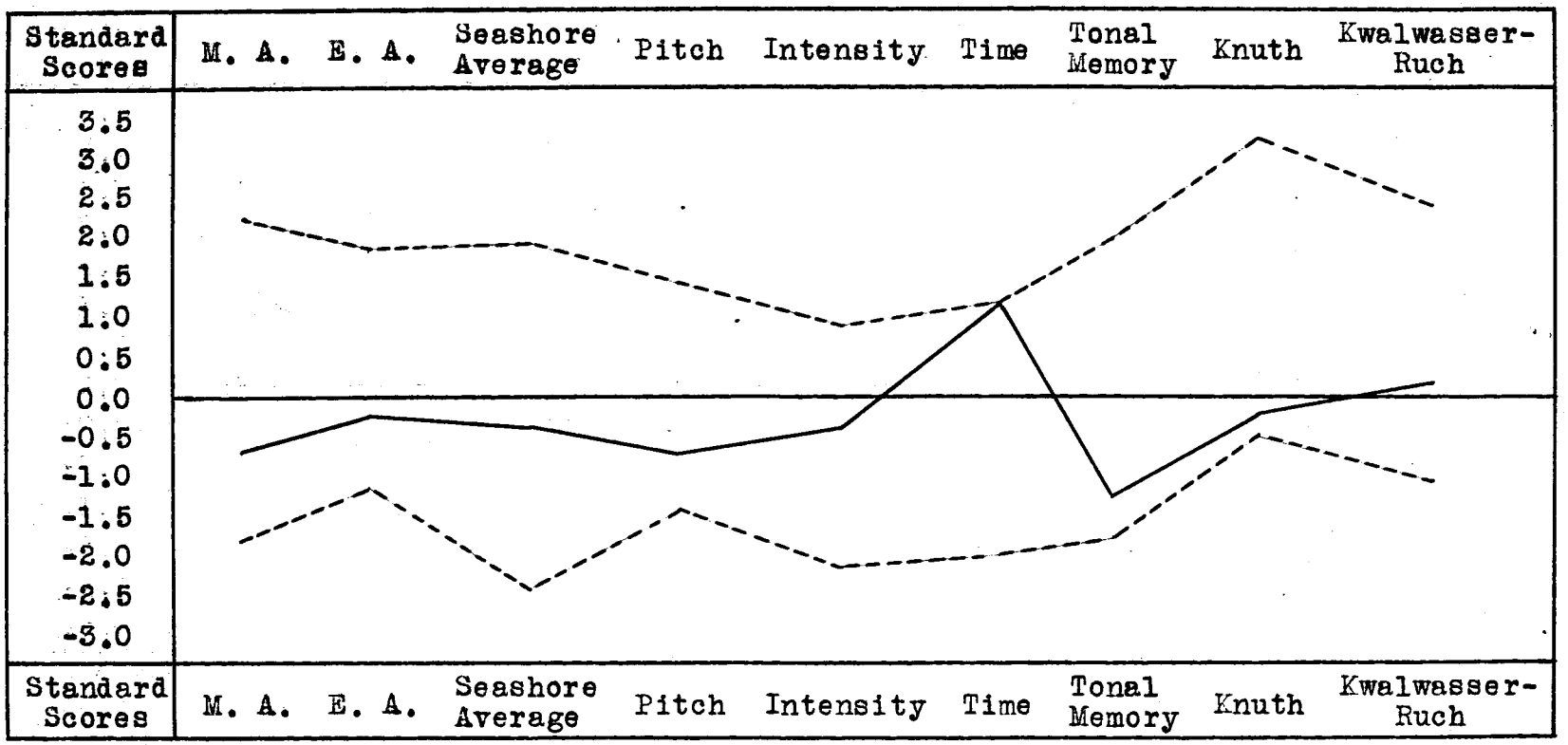
* The number indicates the pupil's class rank on Seashore average scores.

TABLE XXVII

SIX CHILDREN USED IN THE PROFILES, THEIR CLASSES, AND THEIR STANDARD SCORES

Measures of Ability and Achievement	Pupils--Classes and Numbers					
	High		Average		Low	
	7B-1*	8A-4	8B-34	7B-23	7B-38	8A-74
Mental Ages	1.3	2.3	0.4	-0.6	-0.6	-1.8
Educational Ages	0.3	1.7	-0.8	-0.3	-1.2	-1.1
Seashore Average	1.7	1.7	-0.4	-0.4	-2.5	-2.4
Pitch	1.6	1.4	-0.5	-0.6	-1.4	-1.4
Intensity	0.9	0.9	-0.2	-0.4	-2.0	-2.1
Time	1.1	1.1	0.3	1.1	-2.0	-1.9
Tonal Memory	1.5	1.7	-0.8	-1.2	-1.6	-1.6
Knuth	1.9	3.3	0.4	0.2	0.2	-0.4
Kwalwasser-Ruch	0.9	2.4	0.9	0.03	-1.1	-1.0

* The number indicates the pupil's class rank on Seashore average scores.



Measures of Ability and Achievement

FIGURE 13

PROFILES REPRESENTING THE STANDINGS OF THREE PUPILS ON THE NINE MEASURES OF ABILITY AND ACHIEVEMENT

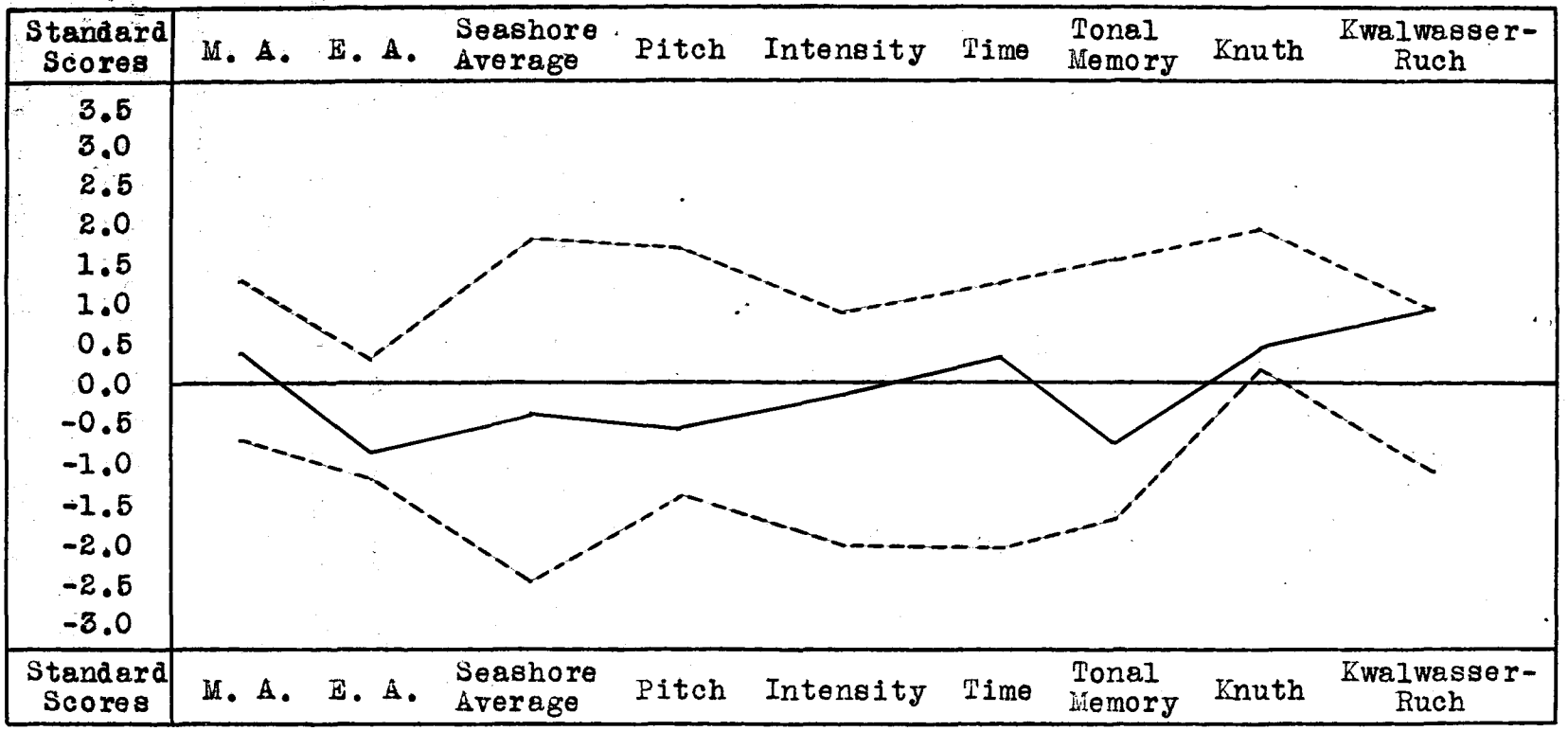


FIGURE 14

PROFILES REPRESENTING THE STANDINGS OF THREE PUPILS ON THE NINE MEASURES OF ABILITY AND ACHIEVEMENT

CHAPTER IV

SUMMARY AND CONCLUSIONS

I. SUMMARY

This summary of the study follows the specific aims listed on pp. 3 and 4 of Chapter I.

1. The intelligence of the group, as a whole, compares fairly well with that of any unselected group of children. The median Intelligence Quotient is 98.5. The individual class medians range from 94.2 to 100. The curve of the Intelligence Quotients is normal at the extremes but irregular at the peak.

2. The 7B's with a median Intelligence Quotient of 100, the 8A's with a median Intelligence Quotient of 99.9, and the 7A's with a median Intelligence Quotient of 99.3 have median Chronological Ages below the standard norms. The 8B class with a median Intelligence Quotient of 94.2 has a median Chronological Age above the norm. The group, as a whole, is slightly young chronologically.

3. The Mental Ages of the group are slightly less than normal. This is consistent with their Intelligence Quotients, ranging from 94.2 to 100. Only one class, the 7B's, has a median above the norm; the 7A's and 8A's are slightly below; and the 8B, the lowest.

The Mental Ages compared with the Chronological Ages show that the 7B Mental Age exceeds the Chronological Age; the 7A Mental Age exactly equals the Chronological Age; the 8A Mental Age is slightly lower than the Chronological Age; and the 8B shows the lowest Mental Age in comparison with the Chronological Age.

4. The median Educational Ages of the group, as a whole, fall slightly below normal. The 7B median Educational Age is slightly above the norm; the 7A and 8A, slightly below the norm; and the 8B, the lowest.

5. The Educational Ages and the Mental Ages compare favorably. The 7B and 8B median Educational Ages are slightly higher than their median Mental Ages; the 7A is exactly the same; and the 8A median Educational Age, slightly below the median Mental Age.

The correlations, by classes, for the Educational Ages and Mental Ages are fairly significant and fairly high: 7B, .89; 7A, .78; 8B, .74; and 8A, .84.

6. The average musical talent of the children, as a whole, is slightly above normal. The test of pitch was most difficult with all class medians below the norm; tonal memory was next in difficulty with only one class median above the norm; intensity was the easiest test with all class medians far above the norm; and time was the second

easiest test with all class medians above the norm, but not as far above as are those for intensity.

7. The Knuth achievement test was very difficult for the children. All medians fall far below the standard norms.

The Kwalwasser-Ruch achievement test showed much more favorable results. The group, as a whole, ranks slightly above normal on this test. The class results vary. The 7B median is slightly above normal; the 7A median, far above normal; the 8A median, slightly below; and the 8B median, far below.

8. The correlations between the Knuth achievement and the Seashore musical talent are low in two cases and fairly significant in two: 7B, .48; 7A, .31; 8B, .63; and 8A, .55.

The correlations between the Kwalwasser-Ruch and the Seashore musical talent are fairly significant in three cases and insignificant in one case: 7B, .72; 7A, .21; 8B, .54; and 8A, .52.

The averages of the former correlations and of the latter are practically the same--.49 and .50, respectively.

9. The forty-one pupils who had had special music training of at least one year on a recognized musical instrument requiring the reading of musical score have higher

medians on the Seashore musical talent test and on the two achievement tests than do the remaining 189 who had had no special musical training. The Seashore median for the former group is 1.4 times that of the latter group; the Knuth median for the former, 2.8 times the latter; and the Kwalwasser-Ruch median for the former, 1.5 times the latter.

10. The correlations between musical talent average scores and Intelligence Quotients average fairly significant, with one insignificant, two fairly significant, and one fairly high: 7B, .82; 7A, .14; 8B, .52; and 8A, .58.

11. Correlations between Knuth achievement and general achievement, as represented by Educational Ages, is low in three cases and negative in one case: 7B, .42; 7A, -.02; 8B, .44; and 8A, .33.

Correlations between Kwalwasser-Ruch achievement and Educational Ages are low in two cases and fairly significant in two cases: 7B, .68; 7A, .32; 8B, .44; and 8A, .61.

There is almost twice as much correlation between Kwalwasser-Ruch and Educational Age as between Knuth and Educational Age.

12. The relationship between general ability and general achievement is closer than the relationship between musical ability and music achievement. The average of the correlations of the former is .81 and of the latter, .49

for Knuth and Seashore and .50 for Kwalwasser-Ruch and Seashore.

II. CONCLUSIONS

The facts presented in the summary indicate the following conclusions:

1. More individual music instruction should be given in terms of the individual differences of the pupils. This would require more equipment and supplies in order to have an enriched curriculum, and a lighter teaching load per teacher. It would necessitate adequate building provisions for instructional purposes.

2. There should be more instrumental instruction in terms of musical ability. Those whose ability indicates possible musicianship, should be given a chance to reach their maximum capacity for vocational purposes. Others with less musical ability should be given less technical training, and should be given training in appreciation for purposes of worthy use of leisure time. The children with less musical talent might, too, be given library work, etc., in related purposeful activities.

3. More music teachers, specialized in various divisions of music, should be employed to conduct the work in place of having just one music teacher do the entire

task. Special vocal, instrumental, band, and orchestra teachers should be employed to carry on work in an ideal way.

4. More vocal instruction should be given, since many good voices are not being developed at present.

5. More time should be allowed for music work. At present music receives only one-half the time of the regular academic subjects. This may account for the fact that the relationship between Mental Ages and Educational Ages, as expressed by correlations, was greater than the relationship between Seashore musical talent and the two musical achievement tests.

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