

COMPARATIVE STUDY OF MUSICAL ACHIEVEMENT OF SPANISH
AND ENGLISH SPEAKING CHILDREN IN THE SIXTH
GRADES OF ALICE, TEXAS

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entitled COMPARATIVE STUDY OF MUSICAL ACHIEVEMENT
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PREFACE

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CHAPTER I

INTRODUCTION

It is commonly believed by the layman and the educator alike that Spanish-speaking children are born with a greater degree of musical capacity than English-speaking children; however, little attempt has been made to prove this theory. It is the purpose of this thesis to make a comparative study of the musical achievement of sixth grade Spanish-speaking and English-speaking children in an effort to prove or disprove the actuality of this theory. The subjects used will be Spanish-speaking and English-speaking sixth grade children from the Nayer School and the Schallert School, respectively, in Alice, Texas. Hereafter, the Spanish-speaking children will be referred to at all times as the Nayer group, and the English-speaking children will be referred to as the Schallert group.

It is believed by the writer that the child's intelligence, musical aptitude, age, ability, economic status, educational background, and musical background contribute a great deal to the potential musical achievement of both Spanish and English speaking children. The means employed by the writer to determine the above elements in the background of the two groups will be: (1) a questionnaire designed by the writer

to assist her in obtaining information about the subjects' age, ability, economic status, educational background and musical background; (2) the Kwalwasser-Dykema Music Test to discover how much musical talent the groups have with which to achieve music; (3) the Kuhlmann-Anderson Tests to determine the intelligence and mental age of the individuals, and (4) a series of musical achievement tests designed by the writer.

Music testing, both in aptitude and achievement is in a relatively elementary stage, as compared with the testing program in other educational subjects. Extensive scientific research has been undertaken in all fields of testing within the last twenty-five years. The writer believes that a testing program such as she has undertaken will provide a worthwhile contribution to the field of knowledge concerning tests and measurements in music.

This thesis will consist of six chapters. A brief history of the testing movement will be presented in Chapter II to serve as background material for this study. Chapter III will be concerned with a description of the questionnaire, how the subjects used for testing were chosen, and the results shown in ability, economic status, educational background, and musical background of both groups as interpreted by the writer. A copy of the questionnaire employed to obtain this inform-

ation will be included. Tabulation of the results will be presented in Table form. In Chapter IV, a description will be furnished of the Kuhlmann-Anderson Tests and the Kwalwasser-Dykema Music Test which the writer has administered for the purpose of comparing the intelligence and musical aptitude, respectively, of both groups. A description will also be given of the conditions under which the tests were administered, the manner in which the results were tabulated, and the results will be given in table form. The musical achievement testing program will be discussed in Chapter V. This chapter will include a description and a copy of each test made out by the writer, as well as a description of the method used in preparing the students for the tests, conditions under which the testing was done, and of the actual testing procedure. Methods used in tabulating data, and the results of the achievement tests will also be briefly discussed, and shown by tables and graphs. In Chapter VI, the writer will summarize the results of all tests and questionnaires administered, and a conclusion will be drawn as to the validity of the theory stated at the beginning of this study.

Manuals, magazine articles, books, the test scores, information provided by the subjects, and information obtained from the music instructor in Schallert School will serve as sources of material.

CHAPTER II

BRIEF HISTORY OF THE MEASUREMENTS MOVEMENT

Introduction

The prominent role which tests and measurements of one kind or another have played in our world history is not generally recognized. Although some kind of measurement seems essential in education the use of tests and measurements has not been confined to the schools.¹ In a passage from Jevon's The Principles of Science published in 1874, which is intended as a history of physical science, there is also a prediction of the future development of measurements in psychology.

As physical science advances, it becomes more and more accurately quantitative. Questions of simple logical fact after a time resolve themselves into questions of degree, time, distance, or weight. Forces hardly suspected to exist by one generation, are clearly recognized by the next, and precisely measured by the third generation. But one condition of this rapid advance is the invention of suitable instruments of measurement. . . . Accordingly the introduction of a new instrument often forms an epoch in the history of science.²

Before 1800

Among the earliest records of the use of various testing devices are those found in the Bible, although these

¹C. C. Ross, Measurement in Today's Schools (New York: Prentice-Hall, Inc., 1947), pp. 27-28.

²Ibid., p. 30.

devices had no direct reference to education, they were usually objective, oral, and very short.¹

Oral quizzing has been a part of classroom procedure from the beginning of the teaching activity. First evidences of the oral examination are found in ancient literature. Socrates was known to subject his pupils to exhaustive and searching questioning. Written tests are probably of more recent origin than oral quizzes but they date back many centuries.²

Individual differences among people have long been recognized. Evidence of this is seen in the fact that Plato divided his ideal society into three classes: workers, protectors, and rulers. He believed that people suited for each class should receive education suited to the fullest development of their personalities. Shortly after the Christian era began, Quintillian wrote that masters should observe differences in the disposition of persons they instructed because he believed that "forms of mind are not less varied than those of bodies."³

¹Ibid., p. 27.

²H. A. Green, A. N. Jorgensen and J. R. Gerberich, Measurement and Evaluation in the Elementary School (New York: Longmen's, Green and Co., 1942), p. 37.

³Ibid., pp. 37-38.

The first clear case on record of scientific recognition of individual differences in mental abilities occurred in 1795. One of the observers in the Greenwich Astronomical Observatory in England was discharged because he differed from his colleagues in his observations.¹

The first tests used to measure the results or outcomes of education were probably much like certain of the performance tests of today. They measured physical performance, and they were oral. Among various primitive tribes, young men were taught to hunt, fish, and fight. In the initiation ceremonies prior to their admission to the ranks of adult males, they were tested on their knowledge of tribal customs, endurance, bravery, and other knowledge and ability thought necessary for tribal protection. The ancient Spartans, whose educational curricula for their youth stressed physical development, conducted examinations as early as 500 B.C. In ancient Athens the stress lay upon athletics and aesthetic development. They evaluated the athletic phase of education by means of games and contests, and the aesthetic phase by means of reading, writing, and singing ability.

The first tests in schools were oral examinations used in the universities in medieval times. The University of

¹F. N. Freeman, Mental Tests, Their History, Principles, and Application (New York: Houghton Mifflin Co., 1926), p. 32.

Bologna by 1219 A.D., and the University of Paris before the close of the thirteenth century, required degree candidates to defend their theses orally. The written educational test probably was first used at Cambridge, England, in 1702.¹

From 1800 to 1850

In 1816 it was discovered by an astronomer that not only did people differ from each other, but also that the same person differed from time to time.²

According to available records, the first examinations of note in America were those at Boston in 1845. One of the specified duties of the Boston school committee was to make an inventory of the school each year. Annual inspection included an oral examination of all pupils, but when the number of pupils increased, this practice became impossible. It was then decided to test only the highest class in each school, but this practice also became impossible with the increasing number of pupils. Finally, the sub-committee which was appointed to survey the grammar departments of the Boston schools in 1845 decided to use written tests. These examinations covered arithmetic, astronomy, geography, grammar, history, and natural philosophy.

¹Green, Jorgensen, and Gerberich, op. cit., p. 39.

²Ibid.

Horace Mann, at that time Secretary of the Massachusetts Board of Education and editor of Common School Journal, commented on the subject of examinations. He stated that the new written examination was so superior to the old oral quiz that no school committee would go back to the latter practice.¹ In his arguments he urged the use of a larger number of questions and suggested the desirability of standardization.²

From 1850 to 1900

With the publication of his Hereditary Genius, Galton brought the study of individual differences into focus in 1869, and he developed it further by instituting a limited program of measuring the various human physical traits and motor abilities, as well as investigating mental ability. He used methods in this program which in later years proved successful.

Dr. E. S. Chaille, an American physician, is credited as early as 1887 with the development of standards and simple tests for judging the mental levels of children up until the age of three. He is also credited with having implied, although not definitely used the concept of mental age.

¹Ibid., pp. 39-40.

²"Examinations," Encyclopedia of Educational Research, 1st ed., p. 471.

Cattell apparently first used the term "mental age" in 1890. He published an article entitled Mental Tests and Measurements describing tests then in use in his own laboratory at the University of Pennsylvania. These tests were designed to measure keenness of eyesight and hearing, reaction time, after-images, color vision, perception of pitch and weight, sensitivity to pain, color preferences, perception of time, accuracy of movement, rate of perception of movement, memory and imagery.¹ Cattell, Wissler, and Jastrow were prominent among experimenters devoting attention to intelligence during the last decade of the nineteenth century. During the same period, Binet and colleagues were experimenting in France with mental tests. In 1895, Binet and Henri described ten types of tests which they thought were likely to discriminate between levels of mental ability.²

Reverend George Fisher, an Englishman, is said to have devised and used what were probably the first objective measures of achievement. His "scale books" were in use in the Greenwich Hospital School as early as 1864. These provided tests in handwriting, spelling, mathematics, navigation, Scripture knowledge, grammar and composition, French, general

¹J. Peterson, Early Conceptions and Tests of Intelligence (New York: World Book Co., 1925), pp. 78-79.

²Green, Jorgensen and Gerberich, op. cit., p. 39.

history, drawing, and practical science. They scaled performance by establishing number one as representative of the highest degree of efficiency and number five representative of the lowest degree of efficiency, going up by units of one-fourth. Although his "scale books" were crude in organization, he lived too far in advance of his day, so his work produced no lasting results.¹

In 1894, Dr. J. M. Rice, a practicing physician, became interested in the work of the schools in connection with its effects on pupils and teachers. He believed that teacher and pupils suffered from nervous disorders brought on by the fact that perfection could not be reached, and that some sort of reasonable standards should be set up which could be attained. He devised tests in spelling and other subjects and gave them in a number of schools in order to determine what could reasonably be expected of pupils. Dr. Rice met opposition from educators because he had brought to light the above mentioned bad situation, but apparently his ideas had possibilities, for his work was taken up by other men. Over a period of time his procedure was developed and applied more carefully and more scientifically by his successors than in his pioneer work.²

¹Ibid., pp. 40-41.

²M. J. Nelson, Tests and Measurements in Elementary Education (New York: The Cordon Co., 1939), pp. 30-31.

An indication of the growth of the testing program towards the end of the nineteenth century is seen in the inauguration of Regents' examinations in New York State from 1865 to 1878 and the establishment of the College Entrance Examining Board in 1900.¹

From 1900 to 1925

Interest in tests up to the early part of the twentieth century was largely theoretical.² The principal development of standardized tests has been accomplished during the twentieth century.³

The first book dealing primarily with mental and educational measurements was written and published by E. L. Thorndike in 1904. It was through this book and his later influence on his students that he became responsible for early development and popularization of standardized educational tests. In 1908 Stone, a student of Thorndike's, published an arithmetic reasoning test; it was the first standardized instrument to make its appearance. Within the following year, E. L. Thorndike published the first standardized achievement scale, the Scale for Handwriting of Children.

¹"Examinations," op. cit., p. 471.

²Freemen, op. cit., p. 55.

³P. W. Dykema and K. W. Gehrke, The Teaching and Administration of High School Music (Boston: C. C. Birchard, Co., 1941), pp. 364-365.

During the period between 1905 and 1915, Courtis published a series of arithmetic tests and Hillegas, Buckingham, Thorndike and Ayres published five scales for measuring abilities in English composition, spelling, drawing, and handwriting.¹

In 1907, the industrial centers grew so rapidly and the school enrollment increased so greatly that the school superintendents, who were relatively untrained, could not cope with the administrative problems. Specialists were furnished by colleges, which were also developing rapidly, to conduct school surveys. About 1911, "bureaus" were established in many states, largely as a result of Courtis' efforts. The peak of the popularity of bureaus was reached in 1921 and 1922. The main purpose of these bureaus at the present time is the promotion of educational measurements in the schools, but in addition they also carry on other research and service activities.²

Binet and Simon, both of French origin brought out the first intelligence scale in 1905 for the purpose of determining which pupils were retarded and needed special instruction. This scale consisted of thirty parts which

¹Green, Jorgensen and Gerberich, op. cit., pp. 45-46.

²"Achievement Tests," Encyclopedia of Educational Research, 1st ed., pp. 1284-1285.

measured a wide range of abilities, scales from the easy to the very difficult. The relative intelligence of different children at any given chronological age could be interpreted by the number of tests they could pass. Goddard, Terman and Kuhlmann used the Binet-Simon tests with American children from 1911 to 1916.¹ Terman and his associates, in 1916, made the Stanford Revision of the Binet Scale at Leland Stanford University in California, and it is easily the most widely recognized revision of the Binet scale in America.² This revision and the more complete revision made in 1937 make use of the Intelligence Quotient based on the relationship between a child's mental age and chronological age.

The Army Alpha test, used for measuring and placing American army recruits and drafted men during World War I, was the first group intelligence test to be published. This test was given to men who could read and understand English. The Army Beta, non-language test, was given to illiterates and to foreign men. The educators responsible for these tests include Yerkes, Yockan, Whipple, and Otis, whose offer of such a service was accepted by the United States Army. In the period from 1918 to the middle twenties, many group intell-

¹Green, Jorgensen and Gerberich, op. cit., p. 43.

²Dykema and Gehrken, op. cit., p. 362.

igence tests were published. Munsterberg's aptitude tests for telephone girls and streetcar motormen in 1913 were followed by tests of mechanical aptitude, musical aptitude, art aptitude, clerical aptitude and aptitude for various subjects of the high school and college curricula prior to 1930.¹

McCall in 1920, published a proposal that teachers be encouraged to construct new-type examinations, meaning objective-type tests.² He said that teachers did not need to depend solely upon standardized tests but could construct their own objective type tests for use in their classroom. The use of objective type tests became very popular after this time.³

The earliest and best known test of musical talent was developed by Seashore in 1915.⁴ In 1919 six original Seashore records were issued, which sought to measure pitch discrimination, intensity discrimination, time discrimination, consonance discrimination, rhythm discrimination, and tonal memory.⁵ In 1924, the Hutchinson Music Test was issued by the Public School Publishing Company, Bloomington, Illinois,

¹Green, Jorgensen and Gerberich, op. cit., p. 45.

²"Examinations," op. cit., p. 471.

³Green, Jorgensen and Gerberich, op. cit., pp. 47-48.

⁴Nelson, op. cit., p. 187.

⁵Dykema and Gehrckens, op. cit., p. 370.

and in that same year the Kwalwasser-Ruch Test of Musical Accomplishment was issued by the State University of Iowa.¹

From 1925 to the Present

The State University of Iowa established a state-wide every-pupil testing program at the high school level in 1929 and extended it to the upper elementary level in 1934. Other educational institutions and state departments of education established a similar testing program during the late twenties and late thirties. By 1939, some type of organized testing program was in operation in twenty-six states.²

Relatively little has been done in tests and measurements applied to music. The work which ranks highest in significance and recognition is that of Professor Carl E. Seashore,³ and the Kwalwasser-Dykema Music Test ranks second in importance. Among others are the Beach Music Test, issued by the Kansas State Teachers College in Emporia, Kansas, in 1930; the Otterstein-Mosher Sight Singing Test, published by the Stanford University Press in 1932; the

¹Ibid., p. 372.

²"Achievement Tests," op. cit., p. 1285.

³"Tests and Measurements in Music Education," Music Supervisor's Journal, Vol. 2 (May, 1925), p. 72.

Gildersleeve Test, issued by the Bureau of Publications, Teachers College, Columbia University in 1933; the Drake Musical Memory Tests for Grades III Through XII, issued in 1934 by the Public School Publishing Company, Bloomington, Illinois; and the Knuth Achievement Test in Music, issued by the Educational Test Bureau in Minneapolis, Minnesota in 1936.¹

From 1917 on, the development of tests and scales was so rapid that by 1928, twenty years after the publication of the first standardized test, nearly 1300 standardized and semi-standardized tests had been catalogued. In 1940 there existed an unpublished count of 2600 standardized and semi-standardized tests.²

Probably the greatest contribution of recent years to the customary knowledge-speed type of examination is that of the Kuhlmann-Anderson Tests. These tests include all school grades from grade one through nine and maturity.³ This series was begun in 1916 by Dr. F. Kuhlmann and was published in 1927; Dr. Rose G. Anderson joined in the preparation of this series in 1920. The twenty-fifth printing appeared in 1942.⁴

¹Ibid., p. 372.

²"Achievement Tests," op. cit., p. 1283.

³P. L. Boynton, Intelligence, Its Manifestations and Measurements (New York: D. Appleton and Co., 1933), p. 240.

⁴The Third Mental Measurements Yearbook, Ed. Oscar K. Buros (New Brunswick: Rutgers University Press, 1949), p. 371.

CHAPTER III

QUESTIONNAIRE

Introduction

The writer administered a group of musical achievement tests as a means to measure the accuracy of the conviction that Spanish-speaking children possess a greater degree of innate musical capacity than English-speaking children. It is believed by the writer that the child's age, ability, economic status, educational background, musical background, intelligence, and musical aptitude contribute a great deal to the musical achievement of both the Spanish-speaking and the English-speaking children.

A questionnaire, a musical aptitude test and an intelligence test were employed to assist the writer in gaining an insight into the subjects' background in terms of what fundamental capacities they have which are necessary for musical achievement. The writer feels that with the results of the questionnaire, intelligence test and musical aptitude test as compared with those of the musical achievement test some conclusion may be drawn as to the relative importance of the nationality of the subjects being tested as compared with the importance of the age, ability, economic status, educational background, and musical background.

Method by which Subjects were Chosen

The subjects tested were sixth grade students from two of the elementary schools in the Alice Public School system. These two schools were the only two elementary schools which had special music instructors conducting the music classes. The music program in the Nayer School has been more consistent than that of Schallert School over the period of the preceding four years. The subjects from the Nayer School had had the same music instructor during this period, whereas the Schallert School subjects had had five music instructors in the same period.

The method used by the writer to determine which class in both schools was to be tested was that of meeting with the principal and sixth grade teachers in their own school first, to explain the testing program and second, to let them decide which sixth grade class they wanted to represent their school.

Description and Administration of Questionnaire

A questionnaire, a copy of which is shown on the next page, was designed to assist the writer in eliciting information concerning the intellectual, economic, and musical background of the subjects to be tested. A key to the questionnaire, located below the questions, was used to summarize the information into age, ability, economic status,

QUESTIONNAIRE

(Asked Orally of Each Individual)

Name: _____ How many years have you
 Date of birth: _____ been to school? _____
 Place of birth: _____
 General health: _____
 Name of Parent or Guardian: _____
 Number of brothers and sisters: _____
 Does your father work? _____ What does he do? _____
 Does your mother work? _____ What does she do? _____
 Do your brothers and sisters work? _____ What do they do? _____
 Do you work? _____ What do you do? _____
 Did your parents finish grade school? _____ High school? _____
 College? _____
 Do you like music? _____ What kind? _____
 Does your mother like music? _____ What kind? _____
 Does your father like music? _____ What kind? _____
 Do your brothers and sisters like music? _____ What kind? _____
 Does your mother sing? _____ Play an instr.? _____
 What instr.? _____
 Does your father sing? _____ Play an instr.? _____
 What instr.? _____
 Do your brothers and sisters sing? _____ Play an instr.? _____
 What instruments? _____
 Do you sing or play together at home? _____
 Has anyone in the family taken music lessons? _____
 What kind? _____
 Do you have a radio at home? _____
 Do you listen to hillbilly music? _____ Opera? _____
 Symphony? _____ Popular? _____ Stories? _____

(Answer to "Do you like music?" was arrived at by asking the following questions: Do you have a piano? _____ What member of the family plays it? _____ Do you have a record player? _____ What member of the family uses it most? _____ Bring me a list of the records you own.
 Do you have a radio? _____ Give me the names of the programs you listen to. _____)

KEY TO QUESTIONNAIRE:

Age: _____
 (Ability) Average: _____ Retarded: _____
 Economic Status: (wages and no. in family) Below average _____, Average _____ Above average _____
 Educational background: Below average _____ Average _____ Above aver. _____
 (Elementary school--below average; High School--average; College--above average)
 Musical Background: Below average _____ Average _____ Above average _____

educational background, and musical background. The significance of the chronological age of the subjects will be discussed in Chapter IV.

The writer divided the ability, economic status, educational background and musical background into classifications which will be interpreted below.

The ability of the subjects was classified as average or retarded. The economic status, educational background and musical background were divided into three classifications: below average, average, and above average.

The number of years that the subjects had attended school determined whether they were considered of average ability or retarded. Subjects who had a five year record of school attendance were considered of average ability and those with more than a five year attendance were considered as being retarded. The questionnaire did not provide space to show those with ability above average; however, the writer encountered two students in the Nayer group who had a four year attendance. These were classified as being above average.

The number of people who worked in the family, and the type of work which they did helped the writer to estimate the wages in the family. The factor used in determining the economic status of the subjects was that of considering the estimated wages as compared to the number of members in the family.

Those subjects whose parents went only through grade school were classified as having an educational background below average. Those whose parents graduated from high school were classified as having an average educational background, and those whose parents graduated from college were classified as having an educational background above average.

The three classifications into which the musical background was divided will be defined as follows: (1) Subjects in whose homes there is little or no sign of inclination toward music will be grouped as being below average. This group will include those subjects who came from homes in which there was no radio, no piano, and no phonograph, and those in which none of the members of the family played an instrument or revealed an interest in singing; (2) In the category of average musical background will fall those subjects who possessed either a radio, a phonograph, or a piano, and also those who came from a family in which some of the members played an instrument and enjoyed singing; (3) The third division will be composed of subjects who possessed a radio, a phonograph, and a piano. It will include those in whose family the majority of members played an instrument and indicated a great interest in singing.

Results

Inasmuch as the two groups under discussion were of different sizes in terms of membership, the results will be presented in percentages.

The group from the Nayer School had 6% of the class above average, 68% average, and 26% retarded in ability, whereas the group from Schallert School proved to be 100% average. The estimated economic status of the Nayer School was 12% below average and 88% average, whereas the Schallert School was 84% average and 16% above average. The summary of the educational background of the Nayer School subjects shows 82% of the group as being below average, 15% as being average, and 3% as being above average. The Schallert School results show 9% of the group as having an educational background below average, 47% average, and 44% above average. The results of the musical background indicate that the Nayer School group was 100% average and the Schallert School group was 94% average and 6% above average.

The results stated above are shown in table form on Table I on the following page.

TABLE I
RESULTS OF QUESTIONNAIRE

Name of Group Represented	Ability			Economic Status			Educational Background			Musical Background	
	Above Average	Average	Retarded	Below Average	Average	Above Average	Below Average	Average	Above Average	Average	Above Average
Nayer Group	6%	68%	26%	12%	88%	...	82%	15%	3%	100%	...
Schallert Group	...	100%	84%	16%	9%	47%	44%	94%	6%

Conclusion

From the results shown above, the writer concludes that the group representing Nayer School rates second to the group representing Schallert School in ability, economic status, educational background, and musical background as defined by the writer.

CHAPTER IV

APTITUDE AND INTELLIGENCE TESTS

The device used to measure the musical talent of the Mayer and the Schallert groups was the Kwalwasser-Dykema Music Test. The Kwalwasser-Dykema Music Test consists of ten tests recorded on five double-faced ten-inch records. The tests cover (1) Tonal Memory, (2) Quality Discrimination, (3) Intensity Discrimination, (4) Feeling for Tonal Movement, (5) Time Discrimination, (6) Rhythm Discrimination, (7) Pitch Discrimination, (8) Melodic Taste, (9) Pitch Imagery, and (10) Rhythm Imagery.¹ The writer will give a brief description of each test along with the response desired from the subject.

Tonal Memory tests the power to listen to tonal patterns of varying length as well as retain them in order to compare them in terms of being the same or different. This test begins with four tones in each pattern, and ends with nine tones in each, summing up to twenty-five pairs of patterns.²

The Quality Discrimination test consists of thirty patterns. In half of these patterns the motive is played by

¹The Third Mental Measurements Yearbook, op. cit., p. 261.

²J. Kwalwasser and P. Dykema, Manual of Directions (New York: Carl Fischer, Inc., 1930), p. 4.

the same instrument twice, therefore producing the same tone quality, and in half of them the motive is played by two different instruments, producing different tone quality. The purpose of this test is to measure the ability to distinguish sameness or difference in quality of tone.¹

In the Intensity Discrimination test there are thirty trials, fifteen pairs of tones followed by fifteen pairs of chords. This test measures the capacity to hear variations in the volume of the tones or chords. The pitch and length remain the same but there are variations in loudness which the subject is asked to record in terms of "weaker" or "stronger," to indicate the strength of the second tone or chord as compared to the first.²

The Tonal Movement test consists of thirty four-tone figures. Each figure is an incomplete melodic idea requiring a fifth tone to complete it. The listener was to complete the idea by indicating in which direction the most satisfactory completion was to be found, above or below the fourth tone, using the terms up or down.³

In the Time Discrimination test, twenty-five items of three consecutive tones are employed. The first and

¹Ibid., p. 6.

²Ibid., p. 8.

³Ibid., p. 10.

third tone are equal in duration, but the second tone varies in length. The acuteness of time sense is measured by this test. The subjects were to judge whether the three time durations of every item were of the same or different length.¹

Inasmuch as pitch is not an indispensable part of rhythm, melody was eliminated from the Rhythm Discrimination test. This test employs twenty-five paired rhythmic patterns. Two different pitches are used in these trial patterns (these are the third line B and the third line C). The final tone of each pattern is C, and all other tones are a half step below, (B). The trial begins with four tones and as the test progresses the number of tones increases. The subjects were asked to indicate whether the patterns were repeated identically or whether changes occurred in time or intensity, by using the terms same or different.²

Forty items are used in the Pitch Discrimination test. In each of these items, a tone with or without a change in pitch is sustained for approximately three seconds. The first twenty trials are pitched approximately one octave above Middle C, and the last twenty items are pitched approximately two octaves above Middle C. The subjects were to

¹Ibid., p. 12.

²Ibid., p. 14.

indicate their capacity to detect variation in the pitch of tones by answering in terms of same or different.¹

The Melodic Taste test consists of ten four-measure melodies, each consisting of Part A and Part B. These are repeated after all ten are played once, making a total of twenty items, each having an A and a B part. The first phrase of each corresponding A and B melody is the same, while the second phrase is different. The subject was instructed to listen and judge which of the two terminating phrases provides the better concluding phrase.²

The Pitch Imagery test is designed to measure the subjects' ability to form images of various tonal effects from music notation. This test has twenty-five tonal patterns which the subjects are to match by ear and sight. The subjects are to indicate whether what they hear on the record is the same or different from the music notation which they see on the printed page on which they are to record their responses.³

The test covering Rhythm Imagery is used in the same manner as the Pitch Imagery test is used with the exception

¹Ibid., p. 16.

²Ibid., p. 18.

³Ibid., p. 20.

of the fact that the Rhythm Imagery test measures the subjects' ability to form images of various rhythmic effects from the music notation.¹

The tests in the Kwalwasser-Dykema Music Test are relatively easy to administer and score, and the responses of all ten tests can be recorded on a single answer blank. These advantages may, to some degree, account for the fact that they are used quite extensively by music educators,² and also for the fact that the writer chose this test for use in her testing program. Experience has shown that these tests are not quite as confusing to the students being tested as is the Seashore Music Talent Test. This latter fact as well as the fact that the writer was more familiar with the Manual of Directions and had more experience administering it than any other aptitude test also influenced the writer in her choice.

Conditions Under Which Given

The Kwalwasser-Dykema Music Test was administered by the writer in both schools during regular school hours, in the month of March. The subjects remained in their home

¹Ibid., p. 22.

²The Third Mental Measurements Yearbook, op. cit., p. 261.

room during the administration of this test. The light, ventilation, outside interruptions, and noise from the playgrounds were controlled as much as was possible in both schools. Discipline and order in the room were more easily maintained with the Nayer group than with the Schallert group. The acoustics were better in the Schallert School than in the Nayer School.

For the administration of this test, the writer used an electric phonograph and placed it on the teacher's desk in front of the room. Standard printed test blanks were passed out to each subject on which they were to record their answers. In giving the instructions to the subjects, the writer followed the Manual of Directions closely. The instructions were made as explicit as thought necessary by the writer to be sure that the groups understood the nature of the test and the nature of the response each subject was asked to make. Ample opportunity was afforded the subjects to hear the first few items of each test and to ask questions which would enable them to comprehend thoroughly what they were to do. The test was divided into two divisions by the writer, and each division was administered on different days. The time allotted for the administration of this test, including the practice period, was approximately thirty minutes for each division of the test. For students who failed to take

the test with the class due to absence, a make-up test was administered by the writer in the library of that school in one period of approximately forty-five minutes.

Method Used to Tabulate Results

Four heavy cardboard matrices, which are a part of the standard equipment, were employed to assist the writer in scoring the music tests for both groups. Two scoring cards are required for each side of the test blank, each card containing slots for only part of the answers. These matrices contribute to speed and accuracy in scoring the tests. After all the wrong answers were marked through, the number of wrong answers were subtracted from the number of items in the test. The number remaining, which constituted the number of correct answers, was recorded in the space provided for this purpose. The scores were arranged by the writer in order from the lowest to the highest score, for the purpose of arriving at a conclusion and comparing the results of the tests for both groups in terms of range, mean, and median. The mode score will not be shown because the writer does not believe that it is a trustworthy type of score.

The range is the distance between the lowest and the highest score made by the group. The mean is computed by

obtaining the sum of the scores made and dividing it by the number of scores in the group. It is the average score for that particular group. The median is the score in the middle of the distribution, or that point which divides the distribution into halves. The mode score is that score which is made by more subjects than any other score. This type of score is a rather flimsy or fickle score, especially in a small group, because the changing of one single score will, in many cases, shift the mode score decidedly.

Results of the Kwalwasser-Dykema Music Test

The results of the tests for both groups will be given in table form. The range of the two groups will be shown on Table II for all the tests. The mean score will be presented on Table III for all the tests, and the median score will be shown on Table IV for all the tests.

TABLE II
RESULTS OF KWALWASSER-DYKEMA MUSIC TEST

Range

Name of Group Represented	Tonal Memory	Quality Discrimination	Intensity Discrimination	Tonal Movement	Time Discrimination	Rhythm Discrimination	Pitch Discrimination	Melodic Taste	Pitch Imagery	Rhythm Imagery
Nayer Group	7-18	18-24	13-25	8-21	12-23	14-22	16-33	9-18	11-20	11-21
Schallert Group	11-23	17-26	18-27	11-30	11-24	13-21	16-34	7-18	10-20	10-22

TABLE III
RESULTS OF KWALWASSER-DYKEMA MUSIC TEST

Mean Scores

Name of Group Represented	Tonal Memory	Quality Discrim- ination	Intensity Discrim- ination	Tonal Move- ment	Time Discrim- ination	Rhythm Discrim- ination	Pitch Discrim- ination	Melodic Taste	Pitch Imagery	Rhythm Imagery
Nayer Group	15	21	22	15	17	18	25	13	15	17
Schallert Group	17	21	23	18	17	18	26	13	14	18

TABLE IV
RESULTS OF KWALWASSER-DYKEMA MUSIC TEST

Median Score

Name of Group Represented	Tonal Memory	Quality Discrimination	Intensity Discrimination	Tonal Movement	Time Discrimination	Rhythm Discrimination	Pitch Discrimination	Melodic Taste	Pitch Imagery	Rhythm Imagery
Nayer Group	16	21	22	15	17	18	26	14	15	17
Schallert Group	18	20	22	17	17	19	28	13	14	18

Description of the Kuhlmann-Anderson Tests

The Kuhlmann-Anderson Tests were administered by the writer in order to determine the comparative chronological age, mental age, and intelligence quotient of the groups under discussion in this study. This series of tests is made up of nine overlapping group tests,¹ including thirty-nine sub-tests on which individual scores are given. The median mental age method of scoring used in this test reduces the significance or possibility of any zero or maximum scores.² The writer used the group test booklet for Grade VI, which included sub-tests twenty-two through thirty-one. One of the leading features of the Kuhlmann-Anderson Tests is that the difficulty of reading as well as the arithmetic content in the booklets from the third grade up is well below the grade level where they are used. The first three booklets of this series of tests is exclusively non-verbal in content, which the writer feels is of significance in considering the language differences of the two groups under discussion in this study. The directions for administering the tests are clear and specific, and scoring is entirely objective.³

¹Educational Test Bureau, Catalog No. 41 (Nashville, Tennessee: Educational Publishers, Inc., 1950).

²Ibid.

³The Third Mental Measurements Yearbook, op. cit., p. 317.

The above mentioned features of the Kuhlmann-Anderson Tests, as well as the writer's familiarity with the Manual of Directions and her experience in administering this test above all other intelligence tests, caused her to choose this test for use in her study.

Conditions Under Which Given

The writer divided the group of tests into two parts, each part given on different days. These tests, like the Kwalwasser-Dykema Music Test, were administered during regular school hours in the month of March. The subjects remained in their home rooms while taking the tests. Standard printed test booklets were issued to the subjects by the writer, and the instructions were given from the manual. The samples given in each sub-test were used to help the subjects understand better the kind of response which was desired for each particular test. The writer used an alarm time-clock in timing the subjects for each sub-test. The writing time allotted for the sixth grade series of tests is twenty-two and one-half minutes; however, the writer used two periods of approximately thirty-minutes each, including the time used to sharpen pencils, issue the test blanks, and give the instructions and samples. The papers were picked up at the end of each period. One forty-minute period was used to administer

the test for one subject who had not taken it, due to absence.

Method of Tabulating Results

The scoring key for Grade VI was used by the writer to correct the booklets after all of the tests had been given. To score the booklets, the key booklet was lined up opposite the pupils responses. All trials answered correctly were marked by drawing a circle around the number of the trial. The number of correct responses were counted and the page in the scoring key opposite the answers for each sub-test contained the Mental Age corresponding to the number of correct answers given by the subject. On the inside of the front cover of each test booklet the Mental Age is tabulated beginning at eight years, going up by consecutive months to nineteen years and eleven months. The Mental Age for each sub-test was recorded on this tabulation to assist the writer in determining the median Mental Age for each subject. To find the median Mental Age for the group of tests for each subject, the writer counted down from the beginning until the fifth lowest Mental Age marked for that subject was reached. Then the sixth lowest Mental Age marked was established and the Mental Age appearing halfway between these two Mental Ages was the median Mental Age for that particular subject. Mental Ages resulting in half months were credited to the

subject in terms of the next full month. For example, a subject with a ten-year and eight and a half month Mental Age was credited with a 10-9 Mental Age.

The writer arranged the chronological age, mental age, and intelligence quotients of all the subjects in each group in order, from the lowest to the highest score made by the subjects in that particular group. The groups will be compared in terms of range, mean, and median Chronological Age, Mental Age, and Intelligence Quotient.

Results of Kuhlmann-Anderson Tests

The results obtained by the writer in the comparative range of the Chronological Age, Mental Age, and Intelligence Quotient of the groups is shown on Table V. Table VI shows the results in the form of a mean score, and Table VII present the difference or comparison of the two groups' Chronological Age, Mental Age, and Intelligence Quotient in terms of median score. The years and months shown on the tables under Chronological Age and Mental Age will be written in hyphenated form at all times.

TABLE V
RESULTS OF KUHLMANN-ANDERSON TESTS
Range

Name of Group Represented	Chronological Age	Mental Age	Intelligence Quotient
Nayer Group	11-9 13-11	11-6 15-9	93-124
Schallert Group	11-2 13-1	10-4 14-9	79-124

TABLE VI
RESULTS OF KUHLMANN ANDERSON TESTS
Mean Score

Name of Group Represented	Chronological Age	Mental Age	Intelligence Quotient
Nayer Group	12-6	15-9	106
Schallert Group	11-11	14-7	106

TABLE VII
RESULTS OF KUHLMANN-ANDERSON TESTS

Median

Name of Group Represented	Chronological Age	Mental Age	Intelligence Quotient
Nayer Group	12-4	13-3	105
Schallert Group	11-9	12-8	106

Conclusion

From the results shown on Tables II, III, and IV, the writer has drawn the following conclusions:

1. That in the Kwalwasser-Dykema Music Test the Nayer group has a narrower range than the Schallert group in all of the tests, except in the Intensity Discrimination test and in the Rhythm Discrimination test. In the Intensity Discrimination test, the Nayer group has a wider range than the Schallert group, although the lowest and highest scores are lower than those of the Schallert group. The range of both groups in the Rhythm Discrimination test is the same although the lowest and highest scores of the Nayer group are higher than those of the Schallert group;

2. That the Nayer group has a lower mean score than the Schallert group in all of the Kwalwasser-Dykema Music Tests except in Quality Discrimination, Time Discrimination, Rhythm Discrimination, Melodic Taste, and Pitch Imagery tests. All of these tests average the same for the Nayer group as for the Schallert group, except the Pitch Imagery test, which is higher for the Nayer group than for the Schallert group. This proves that, according to the mean scores, the Schallert group has a keener sense of Tonal Memory, Intensity Discrimination, Tonal Movement, Pitch Discrimination, and Rhythm Imagery than the Nayer group. Furthermore, according to the mean scores, it stands proven that the two groups of subjects have the same capacity for Quality Discrimination, Time Discrimination, Rhythm Discrimination, and Melodic Taste, and that the Nayer group has a greater capacity for Pitch Imagery than the Schallert group;

3. That the Nayer group has a lower median score in all of the Kwalwasser-Dykema Music Tests except in the Quality Discrimination, Melodic Taste, and Pitch Imagery tests, which show a higher median score for the Nayer group than for the Schallert group, and the Intensity Discrimination and Time Discrimination tests which indicate the two groups as having the same median score. These results show

that the Nayer group rates second to the Schallert group in Tonal Memory, Tonal Movement, Rhythm Discrimination, Pitch Discrimination, and Rhythm Imagery. The results obtained in terms of median scores also indicate that the two groups possess the same degree of capacity to discriminate intensity and time. The Schallert group rates second to the Nayer group in Quality Discrimination, Melodic Taste, and Pitch Imagery, according to the results shown on Table IV.

In summing up the mean scores, the writer found that the Nayer group has a lower score than the Schallert group in five tests, the same score as the Schallert group in four tests, and a higher score in one test.

By summing up the results of the median scores, the writer found that the Nayer group has a lower score than the Schallert group in five tests, the same score in two tests and a higher score in one test.

In considering the mean and median of all the tests of both groups, the writer concludes that the Schallert group has a greater musical aptitude than the Nayer group.

By consulting the results of the Kuhlmann-Anderson Tests presented on Tables V, VI, And VII, the writer concludes that the range of the Chronological Age is wider for the Nayer group than that of the Schallert group, whereas in the case of the Mental Age and Intelligence Quotient the

range is wider for the Schallert group than for the Nayer group. The mean Chronological Age and Mental Age is higher for the Nayer group than for the Schallert group whereas the mean Intelligence Quotient is the same for both groups. In terms of median score, the Nayer group proved to be higher than the Schallert group in Chronological Age and Mental Age; that is, the Nayer group proved to be older than the Schallert group, whereas the median Intelligence Quotient was higher for the Schallert group than for the Nayer group.

CHAPTER V

MUSICAL ACHIEVEMENT TESTS

Introduction

Achievement tests in music are educational tests.¹ The significant relation between intelligence and educational achievement of school children has been noted by research workers.² Even in cases wherein an individual possesses a high grade of musical capacity, such an individual is unlikely to distinguish himself musically if he, or she, possesses a low grade of intelligence. Work habits, general intelligence, interest, the will to succeed, and devotion to music may be measured indirectly by musical achievement tests. A complete picture of a person's musicianship cannot be established by either an achievement or an aptitude test alone. Musical aptitude tests give a measure of musical promise, whereas musical achievement tests record what has been done with native capacity. All achievement tests are learning tests, so that the more training one receives the better score one should earn on an achievement test. This is theoretically

¹J. Kwalwasser, Tests and Measurements in Music (Boston: C. C. Birchard and Co., 1927), p. 33.

²I. N. Madsen, "To What Extent Can Intelligence Be Made to Function in Educational Achievement?" American School Board Journal, Vol. 68 (May, 1924), pp. 63-64.

true, but tests reveal that teaching does not always result in learning. Scores made on achievement tests correlate with both age and intelligence.¹

Tests of musical capacity are valuable. Unless pupils have some capacity for profiting by musical training, they should not be expected to achieve beyond a certain point.² Even though musical aptitude tests furnish valuable information about a person's natural equipment, a low score does not necessarily exclude any one individual from the possibility of high musical achievement, nor does a high score guarantee that he will excel in musical performance.³ Achievement, as measured by the score on any achievement test or by any other criterion, is the product of both aptitude and training, or of heredity and environment. It is found that subjects with poor aptitude who have had considerable training will frequently obtain scores as high as those with considerable talent and little or no training.⁴

¹Kwalwasser, op. cit., pp. 33-34.

²L. W. Webb and A. M. Shotwell, Testing in the Elementary School (New York: Farrar and Rinehart, Inc., 1939), p. 328.

³H. T. Moore, "Some Psychological Aspects of Public School Music," Music Supervisors' Journal, Vol. 10 (February, 1924), p. 58.

⁴G. M. Gilbert, "Aptitude and Training: A Suggested Restandardization of the Kwalwasser-Dykema Music Test Norms," Journal of Applied Psychology, Vol. 25 (June, 1941), pp. 326-327.

Description of Achievement Tests

The musical achievement tests used to determine the comparative musical achievement of the Nayer and Schallert groups were constructed by the writer. These tests involve a series of ten tests, each one treated and scored independently of the other nine. These tests were divided into two groups, learning or technical knowledge, and appreciation tests. All ten tests are of the objective type. The first seven tests were classified by the writer as learning or knowledge tests, and the last three tests were classified as appreciation tests. The appreciation tests include selections which had been presented in class by the music instructors of that group along with a few selections with which the subjects were not familiar.

Test I covered knowledge of musical terms and symbols, Test II covered the recognition of syllable names, Test III was based on recognition of letter names, and Test IV dealt with a knowledge of time signatures. Test V consisted of Part A and Part B, and both parts measured the extent of a knowledge of note values. Test VI also included Part A and B and was used by the writer in an effort to measure the subjects' knowledge of rest values. The content of Test VII was miscellaneous in nature. Tests VIII, IX, and X covered

certain phases of music appreciation in terms of knowledge of form, instrumentation, and program or absolute music, respectively. The Kwalwasser-Ruch Tests of Musical Accomplishments were used by the writer as samples of the type of tests which would be desirable to use. However, the material on which the tests were based was material which the subjects being tested had covered, or hoped to cover by the date established for the administration of these tests.

In each test the subject was supplied with adequate and brief instructions of what was to be done in that test. Long instructions were not used in order to avoid consumption of time and space as well as to avoid confusion in the minds of the subjects.¹

In the construction of this test, the writer attempted to keep the pupils reactions as simple and abbreviated as possible and to have a definite spatial limit for these reactions. The writer made an effort to construct these tests in such a way that only one response or answer was correct and in order that scoring could be facilitated by the use of mechanical scoring devices.

Test I, Knowledge of Musical Terms and Symbols, consists of twenty-five trials in multiple choice form. "The

¹W. A. McCall, Measurement (New York: The Macmillan Co., 1939), p. 80.

multiple choice type of item is usually regarded as the most valuable and most generally applicable of all test forms."¹ Each trial in Test I has five answers given from which the correct one is to be chosen. A sample was used in this test to demonstrate the nature of the response desired for each test. The sample was located immediately below the directions given. The writer arranged the responses so that the correct one occurred in random order. The terms and symbols were presented first, followed by the five answers from which the correct one was to be chosen.

Test II, Recognition of Syllable Names, is made up of twenty-five trials. This test consists of five staves with six notes arranged in consecutive order on each, each staff designating a different key. The keys used by the writer in this test are the keys of C, F, D, Bb, and G major. On each staff the writer uses Do as the first syllable, so the name Do is printed below it on the space provided for that answer. This device is designed for two purposes, first to serve as a sample of what is expected of the students, and second, to establish the key for them. Five different notes are written in each key and the subjects are instructed to write the syllable names on the space provided for that purpose under each note.

¹Ross, op. cit., p. 145.

Test III, Recognition of Letter Names, includes four staves, two of which are in the treble clef, and two of which are in the bass clef. Each staff contains six notes. The writer is expected to identify the first note of each staff and to record the answer on the space furnished under each note for that purpose. The subjects are to imitate this response by locating the letter name for each of the other twenty-five notes on the allocated space under each.

In Test IV, Knowledge of Time Signatures, ten items are used. Each item consists of one complete measure in an unknown time signature. A choice of five time signatures is given from which only one time signature is correct, and the subjects are to draw a circle around the correct one for each item. A sample, located immediately below the directions, is given in order to demonstrate the manner in which responses were to be recorded.

The multiple-choice type of item is used by the writer in Part A and B of Test V, Knowledge of Note Values. Separate directions and samples are given for each part. Part A is made up of ten items. These items consist of incomplete measures in different time signatures. Five kinds of notes are given from which the subjects are to select the only one which will complete the measure correctly and draw a circle around it. Part B also contains ten items. Each item consists

of a time signature and a note. Five numbers are written to the right of these, and the subjects are to draw a circle around the one number representing the correct number of counts which the given note should receive in that particular time signature.

Test VI also has two parts, A and B, and was used in much the same manner which Test V was used, with the exception that this test measured the subjects' knowledge of rest values. Part A needs one rest to complete the measure in each item and in Part B the encircled number represents the correct number of counts which the rest should receive in the given time signature for that item.

Test VII, Miscellaneous, includes thirteen items. For each item different directions are given. Under each direction there is a staff on which the subjects are to locate and encircle the sign or symbol asked for in the directions. In items number eight, nine, ten, and eleven, there is a staff of four measures each in unknown time signatures. The subjects are to write the correct time signature for each.

In Test VIII, Form, the writer attempted to measure the subjects' ability to write the structural pattern of the selection being played, using the letters of the alphabet starting with A to represent the sections heard and the order

in which they were heard. Five items are used and a space is located to the right of each item on which responses are to be recorded. A sample is given below the directions to aid the subjects in understanding on what phase of music appreciation they were being examined.

Five selections were used in Test IX, Instrumentation, to compare the musical achievement of the Nayer and Schallert groups, as determined by their capacity to listen and distinguish between the different instruments of the orchestra and band. The subjects are to listen to each of these five selections and write, on the space provided to the right of each title, which instruments have solo passages, or which family of instrument takes the lead, or predominates.

Test X consists of ten items. These items consist of titles of selections to which the subjects will listen for the purpose of deciding whether that selection represents program or absolute music. To the right of each title a space is provided on which the answer is to be recorded by the subjects. In the directions, the writer also requests that the subjects give a reason why they decided whether that piece was program or absolute music.

Method of Preparing for the Tests

The writer, who is also the music instructor at the Nayer School, met with the music instructor from Schallert

School after the subjects to be used in this study were chosen by the principal, sixth grade teachers, and music instructors in both schools. The purpose of this meeting was to discuss the material which was to be used in the musical achievement tests. The writer made a list of the ten tests and included samples of each to indicate the phases of music which would be covered in the tests and the type of items which would be used in each. This list was handed to the Schallert group instructor so she could use it as a reference during the preparation for this test. For the appreciation tests, the writer included in the list all those compositions which should have been presented to the class and from which only a few would be played during the test.

Miniature oral and written preliminary tests were given to the groups by the music instructors during the preparation period, utilizing some of the musical material to be used and the type of test item to be used in the actual testing program.

Conditions Under Which Given

The musical achievement tests were administered by the writer in both schools at regular school hours during the months of April and May. The subjects were told the purpose of the test in order to insure pupil interest. Interest was

also secured by instilling a feeling of rivalry between the two groups who were to participate in the "contest." Not more than two tests were administered by the writer on one day, and the same test was administered for both groups on the same day as far as it was possible for the writer to do so. The subjects remained in their home rooms at all times while taking the tests. All distractions were anticipated and avoided by the writer as far as possible. Light and ventilation were adjusted when necessary. Noises from the playgrounds and halls were eliminated by the writer to the greatest extent possible.

In order to avoid the inconvenience of the writer writing the questions on the board and having the subjects copy and answer them, the tests were duplicated by the writer by means of mimeographing. A copy of each test was placed in the hands of each subject as each test was administered.

As the writer entered the room, she tried to put the pupils in the proper attitude of mind. In an effort to prevent nervousness or tension and in order to put the subjects at ease, the writer remained calm and made general remarks having nothing to do with the test. Attention was secured and the subjects were instructed by the writer to sharpen their pencils. In distributing the papers, the writer gave

a sufficient supply to pupils in the front row who were asked to distribute the test sheets to their row. The pupils were instructed to place the papers on their desk face down. When all the papers were distributed, the pupils were instructed to turn their paper over and were allowed time to write their names on their paper. The directions were read verbally, slowly, and distinctly by the writer. Subjects were permitted to ask questions aloud before the instructions were given to begin to work, but not after that time. The subjects were instructed to raise their hands instead of speaking aloud whenever they had a question after beginning to write, and the examiner went to the individual child to see what the trouble was. The type of assistance given to the subjects once they had begun work was that of helping them to understand better the mechanics of taking the test and not in attempting to determine the correct answer. After the test began and occasionally thereafter, the examiner moved quietly about the room to see that the subjects were proceeding in accordance with the directions given for the test. The writer stood during all of the tests at one of the front corners of the room when she was not moving about the room. A generous length of time was permitted the subjects to finish the tests. They were not timed, but were instructed to review their answers and to turn their papers face down

after they had finished the test. When the last person finished taking the test, all of the papers were collected at one time.

Method Used in Tabulating Results

The writer scored all the tests herself. She made her own key by writing the correct answers on an unused test paper. The key paper was placed beside the paper in order to be scored close to the subjects' answers and were compared. A line was drawn through the number of items answered correctly by the subject. The number of items answered correctly were counted and this number was placed at the lower right hand corner of that test paper as representative of the subject's score for that test. The same sub-test, or section of the musical achievement test series was scored consecutively in all papers rather than to score the whole series of tests separately for each subject. In case of doubt, the writer tried to ascertain the intent of the pupil; however, if there was no evidence of the correct answer, that item was scored as wrong. The writer arranged the scores made by the members of both groups for each test in the series separately, in order from the lowest score to the highest score made. This was done for the purpose of assisting the writer in comparing the groups as to range, mean, and median.

Results

Tables VIII, IX, and X represent the comparative range, mean, and median score, respectively, of the Nayer and Schallert groups. Graphs I through XIII represent the number of items in each test and the comparative percentage of subjects who answered each item correctly in each group. A copy of each corresponding test or part of a test is included before each graph to enable the reader to gain knowledge of the exact content of each test. Two graphs were made for Test X, although this test consists of only one part. Graph XII will be representative of the comparative percentage of subjects who answered correctly whether the selection was program or absolute music, and Graph XIII will be representative of the comparative percentage of subjects who answered correctly why the piece being played was program or absolute music.

TABLE VIII
RESULTS OF MUSICAL ACHIEVEMENT TESTS

Range

Group Represented	Terms and Symbols	Syllable Names	Letter Names	Time Signature	Note Values	Rest Values	Miscellaneous	Form	Instrumentation	Program or Absolute Music
Nayer Group	11-24	3-25	4-20	2-10	3-20	3-20	2-13	0-5	1-5	8-20
Schallert Group	7-23	1-25	4-20	1-10	0-20	3-19	2-12	0-5	1-4	0-17

TABLE IX
RESULTS OF MUSICAL ACHIEVEMENT TESTS

Mean Scores

Group Represented	Terms and Symbols	Syllable Names	Letter Names	Time Signature	Note Values	Rest Values	Miscellaneous	Form	Instrumentation	Program or Absolute Music
Nayer Group	18	15	15	7	12	13	11	3	3	15
Schallert Group	15	14	14	7	9	7	8	2	3	10

TABLE X
RESULTS OF MUSICAL ACHIEVEMENT TESTS

Median Scores

Group Represented	Terms and Symbols	Syllable Names	Letter Names	Time Signature	Note Values	Rest Values	Miscellaneous	Form	Instrumentation	Program or Absolute Music
Nayer Group	18	15	18	8	12	13	13	4	4	15
Schallert Group	15	15	15	7	9	6	8	2	3	10

Conclusion

The conclusion drawn by the writer after consulting the results of the musical achievement tests as shown in Tables VIII, IX, and X will be discussed below. The writer found that the range of the scores received by the Nayer group in all of the musical achievement tests were wider than that of the Schallert group, except in the tests on Recognition of Letter Names, and Form. The range of these two tests was the same for both groups. The average, or mean scores proved to be higher for the Nayer group than for the Schallert group for each test except the tests on Time Signatures, and Instrumentation. The mean scores for these two tests were the same for both groups. From the results of the musical achievement tests as shown in terms of median scores, the writer discovered that the Nayer group achieved a higher median score in all of the tests except in the test on Syllable Names. The two groups achieved the same median score on this test.

In terms of range, the Nayer group showed a wider range of scores than the Schallert group in eight tests and the same range as the Schallert group in two tests. In terms of mean and median scores, the Nayer group achieved a higher mean score than the Schallert group in eight tests and the same mean score as the Schallert group in two tests

a wider median score than the Schallert group in nine tests, and the same median score as the Schallert group in one test.

In a final summation of the results of the musical achievement tests as represented on Tables VIII, IX, and X in terms of range, mean, and median scores, the writer concludes that the Mayer group has a greater musical achievement than the Schallert group.






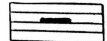
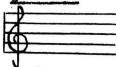



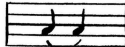
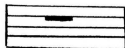

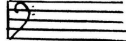

KNOWLEDGE OF MUSICAL TERMS AND SYMBOLS

TEST I

Directions: Below are twenty-five questions about music.

Five answers are given to each question. Read each question carefully and draw a circle around the right answer. The sample is already marked as it should be.

Sample: The third tone of the scale is: so, fa, re, ti, mi

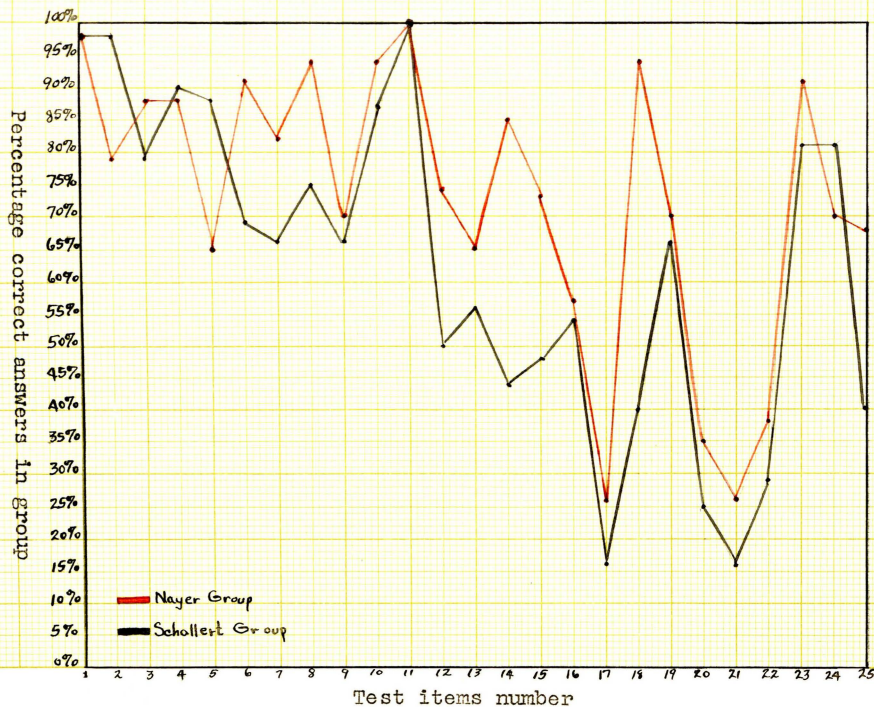
1. The first tone of the scale is: mi, re, so, do, fa
2.  is called a: rest, natural, sharp, note, flat
3. The fifth tone of the scale is: do, fa, mi, so, re
4.  is a: flat, note, natural, rest, sharp
5.  is a: sharp, flat, natural, note, rest
6.  is a: slur, hold, rest, double sharp, repeat sign
7.  is a: sharp, flat, natural, note, rest
8.  is called a: sharp, flat, natural, note, rest
9. piano means: soft, loud, fast, slow, smooth
10.  is called a: bar, note, measure, accent, clef
11. $3/4$ is a: clef, measure, time-signature, accent, phrase
12.  means: higher, lower, louder, repeat, pause.
13. Allegro means: lively, slow, repeat, accent, sweetly
14.  the curved line is a: tie, rest, hold, slur, accent
15. forte means: fast, loud, slow, soft, smooth
16.  means: faster, louder, softer, slower, smooth
17. logato means: soft, quick, loud, connected, separated
18.  the curved line is a: slur, hold, tie, rest, accent
19.  is a: tie, sharp, natural, rest, hold
20. crescendo means: softer, louder, slower, faster, smooth
21. diminuendo means: smoother, louder, softer, faster, slower
22. staccato means: quick, soft, separated, connected, loud
23.  is a: sharp, natural, note, flat, rest
24.  is called a clef, sharp, measure, accent, bar
25.  is a: clef, staff, measure, phrase, accent

Score: No. right _____

GRAPH I

Test I

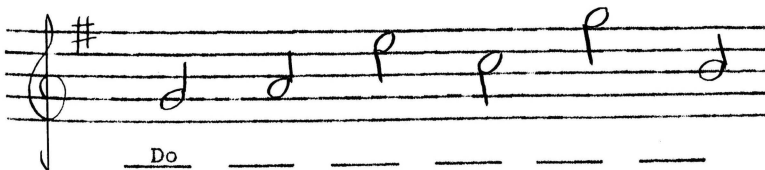
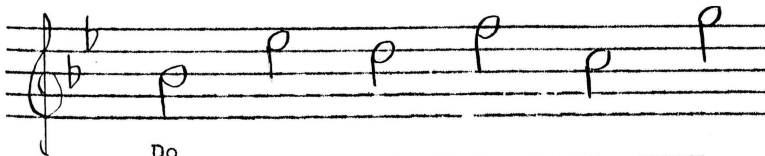
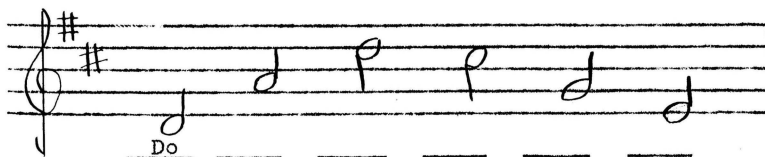
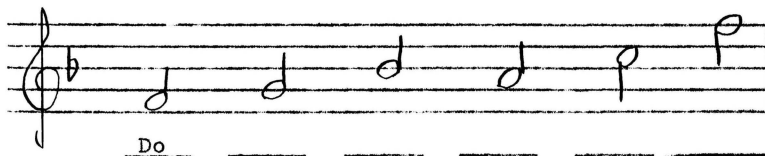
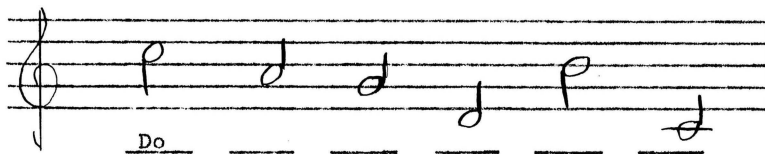
Knowledge of Musical Terms and Symbols



RECOGNITION OF SYLLABLE NAMES

TEST II

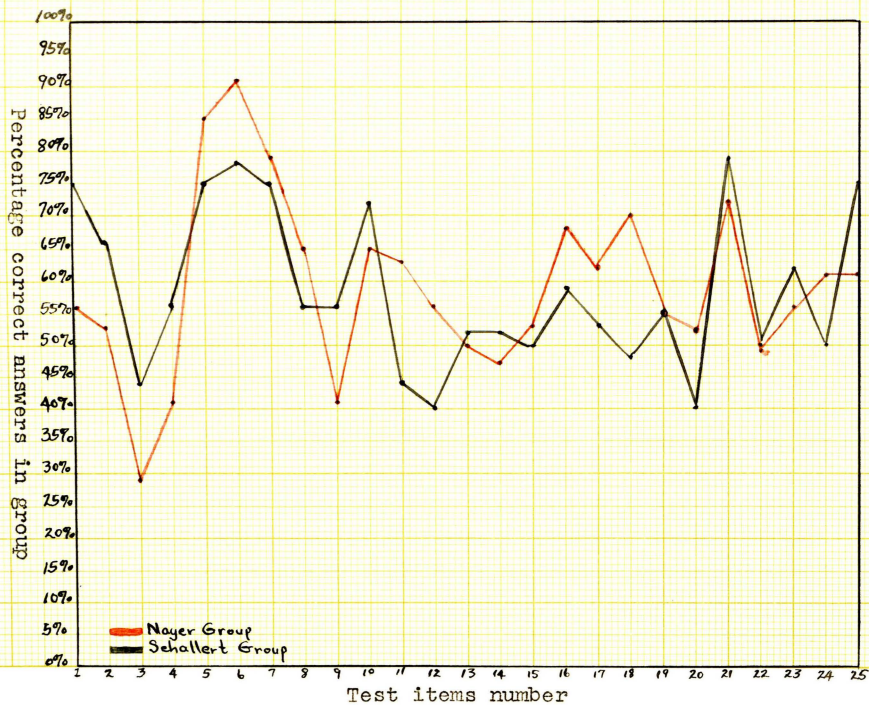
Directions: Below are five lines of notes. The first syllable in each line is Do, so the name Do has been written below it. You are to write the syllable names on the lines under the other notes.



GRAPH II

Test II

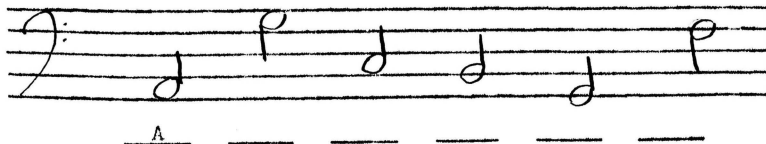
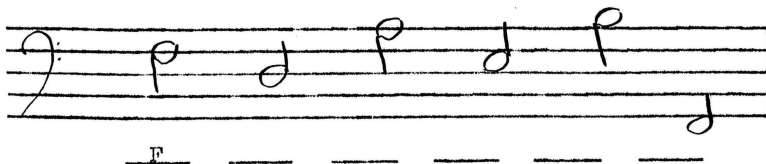
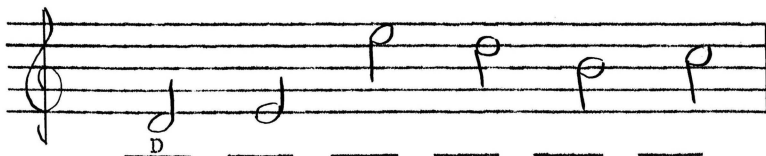
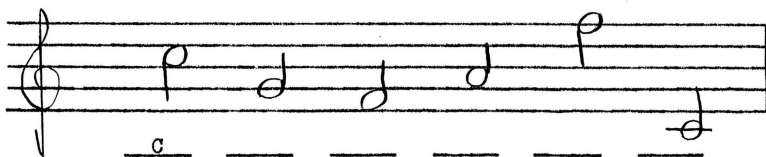
Recognition of Syllable Names



RECOGNITION OF LETTER NAMES

Test III

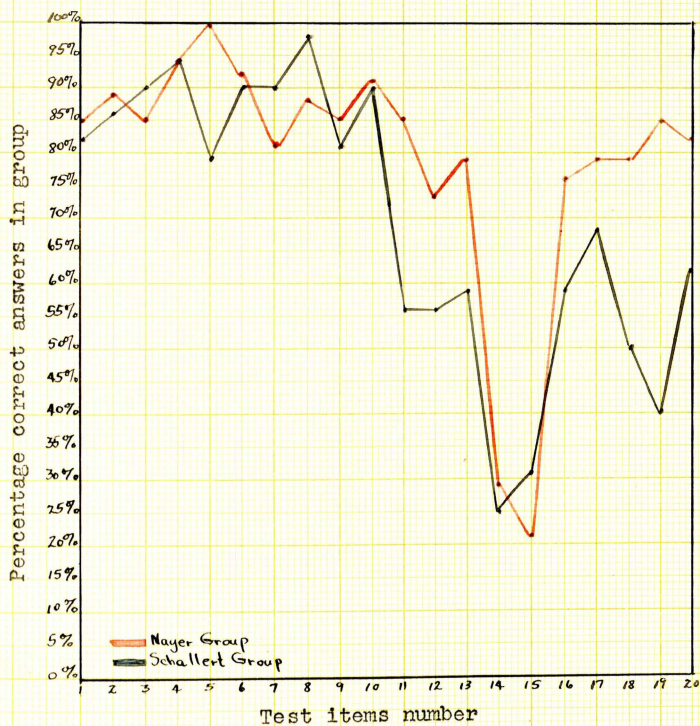
Directions: Below are four lines of notes. The letter name of the first note in each line is already correctly given. You are to write the letter names on the lines under the other notes.



GRAPH III

Test III


Recognition of Letter Names



KNOWLEDGE OF TIME SIGNATURE

Test IV

Directions: Below are ten full measures. At the right of each measure there are five time signatures. You are to draw a circle around the correct time signature for each measure. The sample is already marked as it should be.

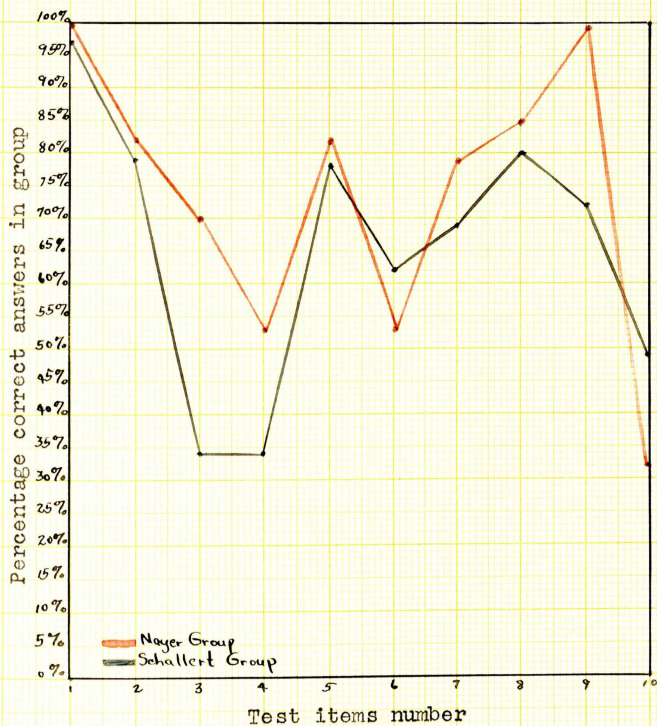
Sample:  The time signature is 2/4 4/4
3/8 6/8 3/4

1.  The time signature is 9/8 4/4 3/4
2/4 3/8
2.  The time signature is 3/4 4/4 6/8
9/8 3/8
3.  The time signature is 5/4 3/8 3/2
6/8 2/4
4.  The time signature is 4/4 3/8 9/8
6/8 2/4
5.  The time signature is 2/4 3/8 3/4
4/4 3/2
6.  The time signature is 6/8 3/8 2/4
3/4 3/2
7.  The time signature is 9/8 4/4 6/8
5/4 3/4
8.  The time signature is 2/4 3/4 4/4
3/8 9/8
9.  The time signature is 5/4 3/8 2/4
3/4 9/8
10.  The time signature is 3/8 9/8 2/4
6/8 4/4

GRAPH IV

Test IV

Knowledge of Time Signatures


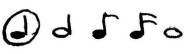


KNOWLEDGE OF NOTE VALUES

Test V

PART A

Directions: In the measures below, one note has been left out of each. You are to draw a circle around the one note needed to complete the measure. The sample is already marked as it should be.

Sample:  The note needed is: 

-
1.  The note needed is: 
 2.  The note needed is: 
 3.  The note needed is: 
 4.  The note needed is: 
 5.  The note needed is: 
 6.  The note needed is: 
 7.  The note needed is: 
 8.  The note needed is: 
 9.  The note needed is: 
 10.  The note needed is: 

GRAPH V

Test V - Part A

Knowledge of Note Values














KNOWLEDGE OF NOTE VALUES

Test V

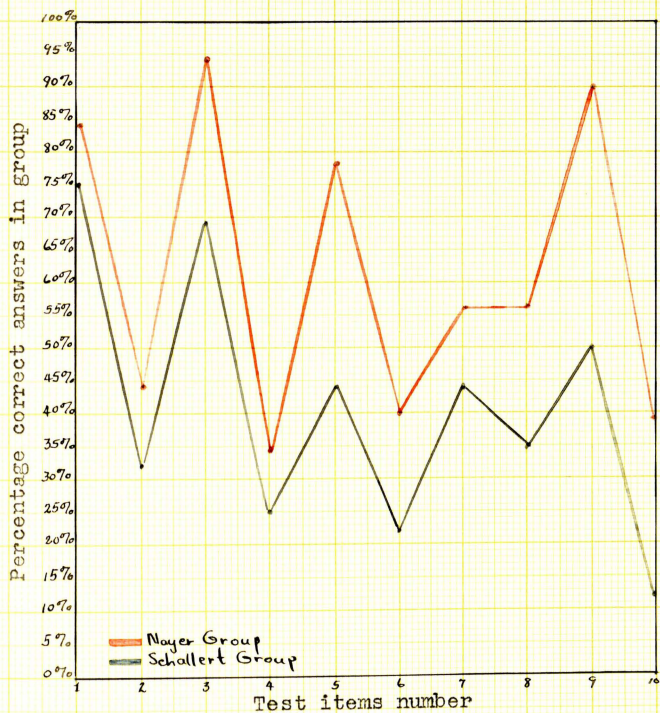
PART B

Directions: Below are ten notes. You are to draw a circle around the correct number of counts which each gets in the given time signature. The sample is already marked as it should be.

Sample: In $4/4$ a  gets: 2, 4, $\frac{1}{2}$, 4, 3 counts.

1. In $2/4$ a  gets: 3, 2, $1\frac{1}{2}$, 1, 4 counts.
2. In $3/8$ a  gets: 6, 4, 1, $\frac{1}{2}$, 3 counts.
3. In $4/4$ a  gets: 2, 1, 3, 6, 4 counts.
4. In $6/8$ a  gets: $\frac{1}{2}$, 3, $1\frac{1}{2}$, 4, 2 counts.
5. In $3/4$ a  gets: 4, 2, $\frac{1}{2}$, 1, 3 counts.
6. In $3/2$ a  gets: $1\frac{1}{2}$, $\frac{1}{2}$, 2, 1, 3 counts.
7. In $9/8$ a  gets: 1, 2, 3, 4, 9 counts.
8. In $3/4$ a  gets: 2, $1\frac{1}{2}$, 3, 1, $\frac{1}{2}$ counts.
9. In $5/4$ a  gets: 5, 4, 3, 2, 1 counts.
10. In $4/4$ a  gets: 3, 6, $1\frac{1}{2}$, 2, 1 counts.

GRAPH VI
Test V - Part B
Knowledge of Note Values

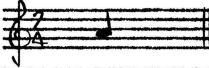


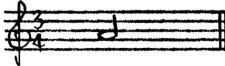
KNOWLEDGE OF REST VALUES


Test VI

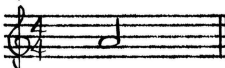
Part A

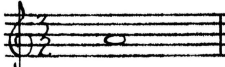
Directions: The ten measures below are incomplete. You are to draw a circle around the one rest needed to complete the measure. The sample is already marked as it should be.

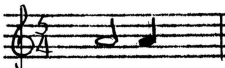
Sample:  The rest needed is: 7 — 7 — ⓧ


1.  The rest needed is: ⓧ 7 — — 7

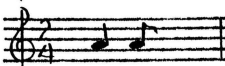
2.  The rest needed is: 7 ⓧ — 7 —

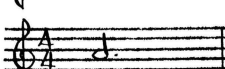
3.  The rest needed is: 7 — ⓧ 7 —

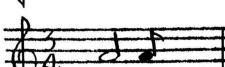
4.  The rest needed is: — 7 ⓧ 7 —

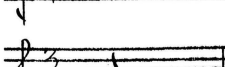
5.  The rest needed is: 7 — 7 — ⓧ

6.  The rest needed is: — ⓧ 7 — 7

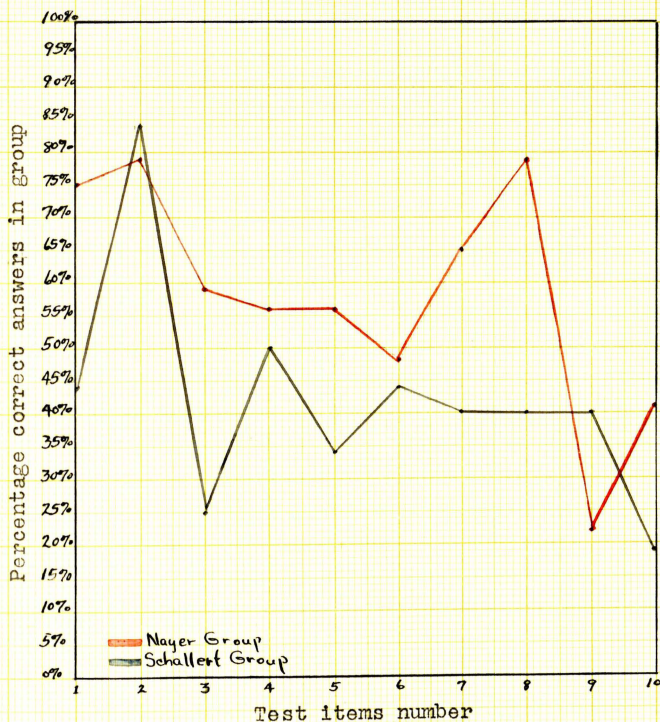
7.  The rest needed is: ⓧ 7 — 7 —

8.  The rest needed is: 7 ⓧ — — 7

9.  The rest needed is: — ⓧ 7 — 7

10.  The rest needed is: — — 7 ⓧ 7

GRAPH VII
Test VI - Part A
Knowledge of Rest Values



KNOWLEDGE OF REST VALUES

Test VI

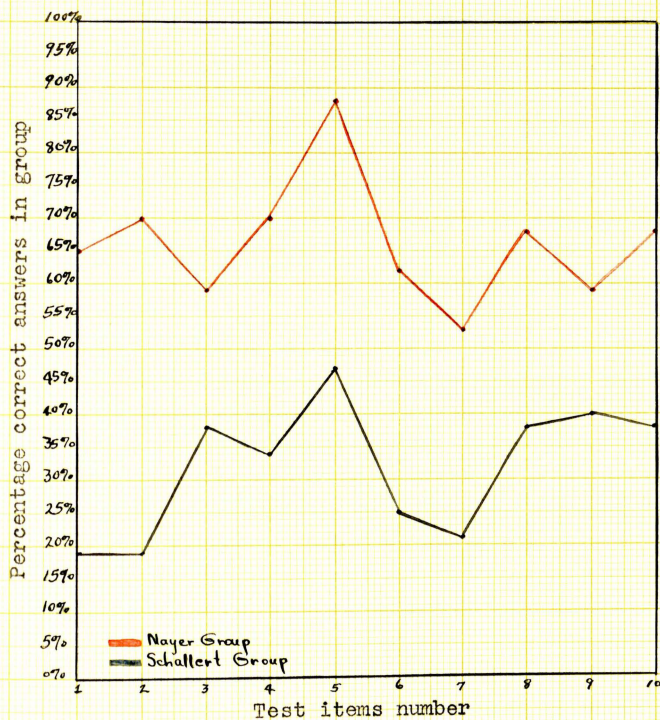
PART B

Directions: Below are ten rests. You are to draw a circle around the correct number of counts which each gets in the given time signature. The sample is already marked as it should be.

Sample: In $2/4$ a Z gets: 3, 4, 2, ①, $\frac{1}{2}$ counts.

1. In $3/4$ a — gets: 3, 2, 4, $\frac{1}{2}$, 1 counts.
2. In $3/8$ a Z gets: $\frac{1}{2}$, 1, 3, $1\frac{1}{2}$, 2 counts.
3. In $4/4$ a — gets: 1, $\frac{1}{2}$, 4, 2, $\frac{1}{4}$ counts.
4. In $5/4$ a Z gets: 4, 1, 3, $\frac{1}{2}$, 2 counts.
5. In $3/2$ a — gets: 9, 6, 5, 1, 4 counts.
6. In $2/4$ a γ gets: $\frac{1}{2}$, 1, $1\frac{1}{2}$, $\frac{1}{4}$, 2 counts.
7. In $9/8$ a γ gets: 8, 2, $\frac{1}{2}$, 3, 1 counts.
8. In $3/4$ a Z gets: 3, 2, 1, 4, $\frac{1}{2}$ counts.
9. In $2/4$ a — gets: 2, 4, 1, 3, 5 counts.
10. In $4/4$ a γ gets: $\frac{1}{2}$, $1\frac{1}{2}$, 1, $\frac{1}{4}$, 4 counts.

GRAPH VIII
Test VI - Part B
Knowledge of Rest Values



Test VII

Directions: Read each direction carefully and do what it tells you to do. Be sure to complete every exercise.

1. Draw a circle around the whole note.

(1)



2. Draw a circle around the eighth rest.

(2)



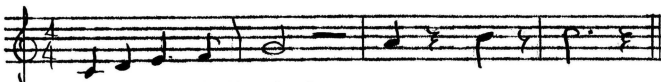
3. Draw a circle around the eighth note.

(3)



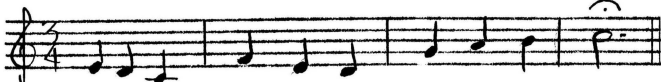
4. Draw a circle around the half rest.

(4)



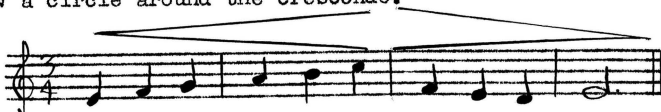
5. Draw a circle around the hold.

(5)



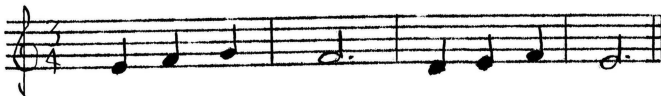
6. Draw a circle around the crescendo.

(6)



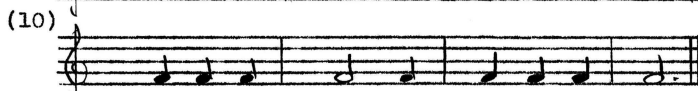
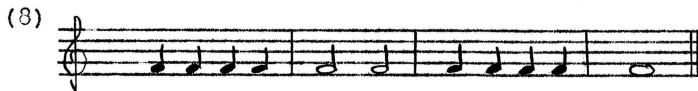
7. Draw a circle around the G clef (treble clef).

(7)



Test VII (cont'd)

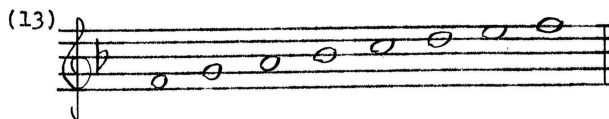
- 8-11. Write the time signature for each of the four exercises below:



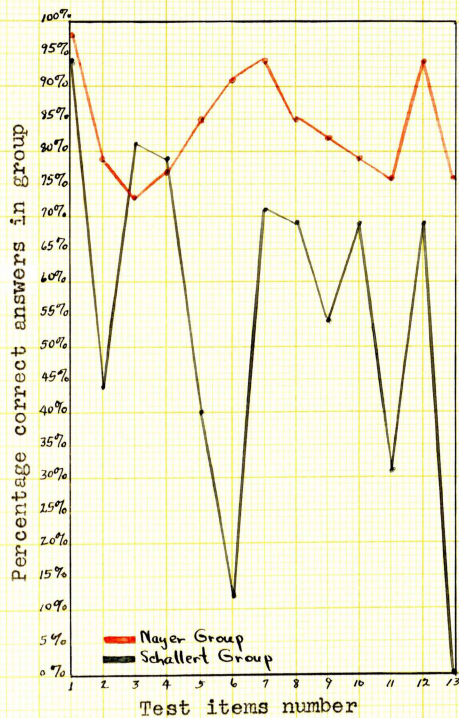
12. Draw a circle around the repeat sign.



13. Draw a circle around the lower tetrachord in the following scale.



GRAPH IX
Test VII
Miscellaneous



APPRECIATION
FORM

Test VIII

Directions: Below is a list of five selections. You are to listen to each one and write the form for it on the blank to the right of each. The sample is already marked as it should be.

Sample: 1. Minuette (Don Juan - Mozart) ABA 1.

1. SKATER'S WALTZ (Waldteufel) 1.

2. THE CLOCK (Kullak) 2.

3. COUNTRY DANCE (Weber) 3.

4. HUNGARIAN DANCE (Brahms) 4.

5. MINUETTE (Gluck) 5.

GRAPH X
Test VIII
Form



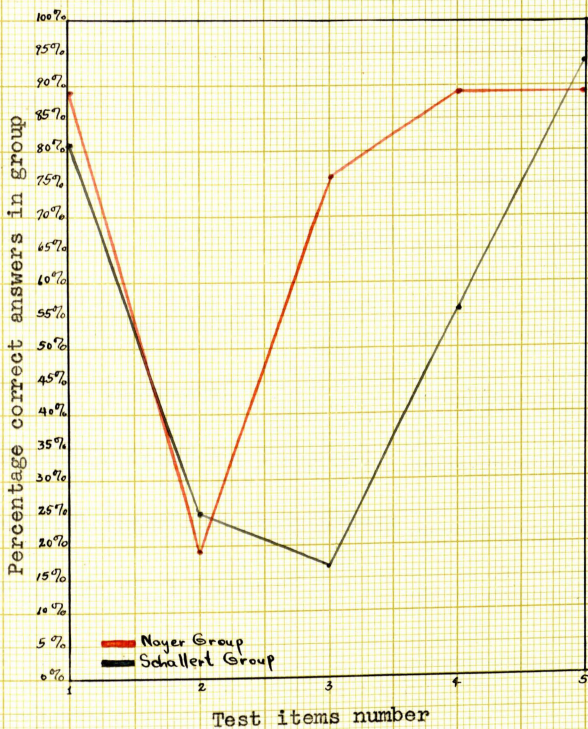
APPRECIATION
INSTRUMENTATION

Test IX

Directions: Below is a list of five selections. You are to listen to each one and write on the blank to the right of it which instruments have solo passages or which family of instruments takes the lead.

1. BERCEUSE (Ilyinsky) _____ 1.
2. MARCH OF THE THREE KINGS (Bizet) _____ 2.
3. NOCTURNE (Midsummer Night's
Dream-Mendelssohn) _____ 3.
4. SURPRISE SYMPHONY (Second
Movement-Haydn) _____ 4.
5. MARCH (Aida-Verdi) _____ 5.

GRAPH XI
Test IX
Instrumentation



APPRECIATION
PROGRAM OR ABSOLUTE MUSIC? WHY?

Test X

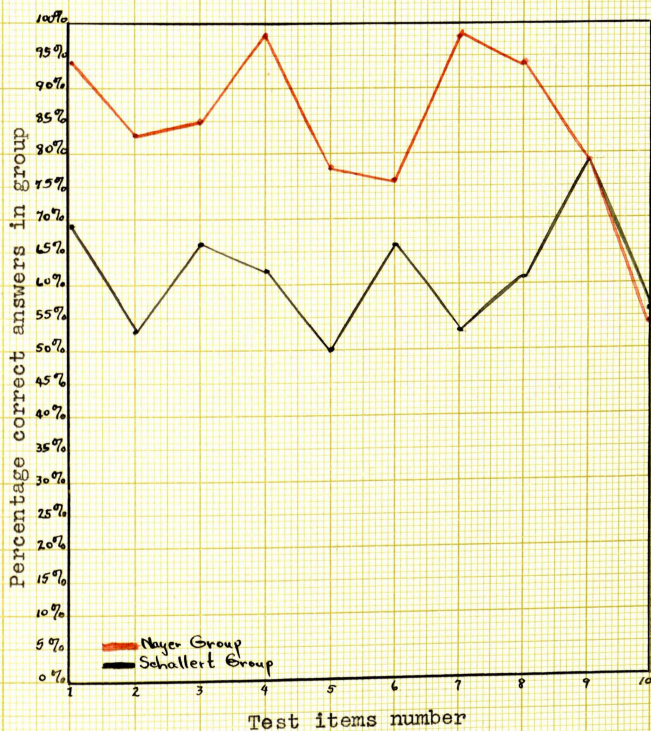
Directions: Below is a list of ten selections. You are to listen to each one and write on the blank to the right of each whether it is program or absolute music and why.

-
- | | | |
|--|-------|-----|
| 1. THE MUSIC BOX | _____ | 1. |
| 2. MINUTTE (Gluck) | _____ | 2. |
| 3. Theme from SONATA IN A (Mozart) | _____ | 3. |
| 4. CHILDREN'S PRAYER (Hansel and Gretel-Humperdinck) | _____ | 4. |
| 5. SCHERZO (Schubert) | _____ | 5. |
| 6. NORWEGIAN DANCE NO. 3 (Grieg) | _____ | 6. |
| 7. MORNING (Peer Gynt Suite-Grieg) | _____ | 7. |
| 8. Symphony No. 1 (Brahms) | _____ | 8. |
| 9. GAVOTTE (Mozart) | _____ | 9. |
| 10. ETUDE IN G FLAT MINOR
OPUS 25 No. 9 (Chopin) | _____ | 10. |

GRAPH XII

Test X - Part I

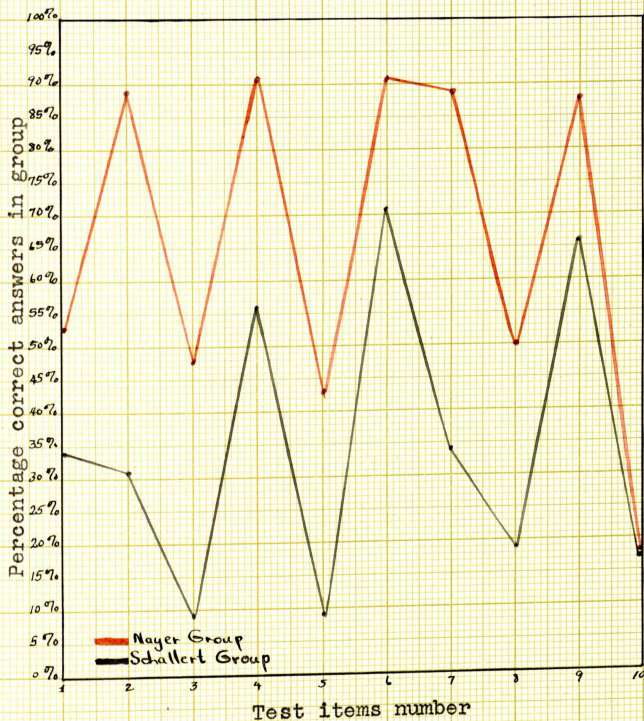
Program or Absolute Music



GRAPH XIII

Test X - Part II

Program or Absolute Music-Why?



CHAPTER VI

SUMMARY AND CONCLUSIONS

It was the purpose of this study to measure the musical achievement of sixth grade Spanish and English speaking children in an effort to prove or disprove the actuality of the theory that Spanish speaking children are born with a greater degree of musical capacity than English speaking children.

A brief history of the measurements movement shows that the use of tests and measurements has not been confined to the schools. The Bible reveals earliest records of the use of various testing devices, and ancient literature reveals first evidences of the oral examination. Individual differences were recognized as far back as Plato's days, although the first real case on record of scientific recognition of individual differences in mental abilities did not occur until 1795. The lineage of our concepts and techniques of educational measurements may be traced to developments in Germany, with the work of Wundt, in England, with the work of Galton and Reverend George Fisher, in France with the work of Binet, and in America with the work of Cattell, Terman, Horace Mann, Dr. E. S. Chaille, McCall, and Thorndike, Dr. J. M. Rice, and Otis. The brief history of the measurements

movement also revealed that the Seashore music talent test ranks first and the Kwalwasser-Dykema Music Test ranks second in significance and recognition among tests and measurements applied to music.

A description of the method used in selecting the subjects to be tested is given in Chapter III. Information regarding the ability, economic status, educational background, and musical background of the subjects in each group was obtained by the writer by means of a questionnaire, a copy of which is provided in Chapter III, which was administered by means of individual interviews with each subject. From this information the following conclusions were drawn. First, that the Nayer group rates second to the Schallert group in ability, economic status, educational background, and musical background. Second, that although there are more subjects in the Schallert group who receive private musical training, the Nayer group has had a more consistent music program in their school. Tabulation of the results of the questionnaire is shown by means of a table, Table I.

A description of the Kwalwasser-Dykema Music Test and the Kuhlmann-Anderson Tests, which were used as the device to measure musical talent and intelligence, respectively, of the Nayer and Schallert groups is presented in Chapter IV. An account is given of the conditions under which these tests

were given, the method used to tabulate results, and the results of the tabulation of scores is shown on Tables II, III, IV, V, VI, and VII. From the results of the Kwalwasser-Dykema Music Test shown on Tables II, III, and IV, the writer concludes that the Schallert group has a greater musical aptitude than the Nayer group, the difference between the two groups being very slight. Information regarding the intelligence of the two groups obtained by the Kuhlmann-Anderson Tests led to the two following conclusions. First, that the chronological age and mental age of the Nayer group is higher than that of the Schallert group. Second, that the intelligence quotient is the same for both groups.

The musical achievement testing program was discussed in Chapter V. Information was furnished as to the relation between intelligence and educational achievement, musical aptitude and musical achievement. A description was given of the musical achievement tests which were used, the method for preparing for the tests, the conditions under which they were given, and the method used in tabulating the results. A copy of each musical achievement test was included along with tables and graphs showing the tabulation of results. From these tables and graphs the following conclusions were drawn. First, that the Nayer group has a greater musical achievement than the Schallert group. Second, that with the

results shown in this group of tests along with all factors investigated in this study, the writer has demonstrated the relative importance of the nationality of the subjects being tested as compared with the importance of the age, ability, economic status, educational background, and musical background. The Spanish speaking children of relatively the same musical talent and intelligence as English speaking children have a greater capacity for musical achievement.

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