A STUDY OF THE MUSICAL TALENT AMONG INDIAN CHILDREN FROM THE PAWNEE INDIAN AGENCY JURISDICTION, PAWNEE, OKLAHOMA A STUDY OF THE MUSICAL TALENT AMONG INDIAN CHILDREN FROM THE PAWNEE INDIAN AGENCY JURISDICTION, PAWNEE, OKLAHOMA 1

By

RUDOLPH HARRY WEYLAND Bachelor of Arts Northwestern College Watertown, Wisconsin

1934

Submitted to the Department of Secondary Education Oklahoma Agricultural and Mechanical College In Partial Fulfillment of the Requirements for the Degree of MASTER OF SCIENCE

OKLAROMA1 AGRICULTURAL & MECHANICAL COLLEGE LIBRARY FEB 28 .346 0 Chairman, Thesis Commit

Member of the Thesis Committee

Head of the Department

Dean of the Graduate School

APPROVED BY:

ACKNOWLEDGMENTS

The writer is indebted to Professor Guy A. Lackey for the many hours of assistance he has given in connection with this study.

The administrators and faculties of the various schools where the testing program in connection with this study was carried out are herewith thanked most sincerely for their splendid cooperation in assisting in making this study possible. The help of the author's wife, Mrs. LaJune Weyland, who assisted in administering the tests, in tabulating and proof reading the study, is also hereby acknowledged.

R. R. W.

TABLE OF CONTENTS

NE ST

Chapter	Title	Page
I	Introduction	1
II	Subjects and Material Used	7
III	Procedures Used	21
IV	Analysis and Interpretation of Findings	26
v	Summary of Results and Conclusions	50
	Bibliography	55

iv

LIST OF TABLES

Table	Title	Page
I	The Grade and Sex Distribution of the Subjects	8
II	Tribal Distribution of the Subjects	9
III	Pitch Test on all Groups Tested	26
IV	Loudness Test on All Groups Tested	27
v	Rhythm Test on All Groups Tested	27
VI	Time Test on All Groups Tested	28
VII	Timbre Test on All Groups Tested	28
VIII	Tonal Memory Test on All Groups Tested	29
IX	Range of Scores on All Tests for Each Group	29
x	Means and Standard Deviations for the	
	Seashore Measures of Musical Talent (Norms)	31
XI	Comparison of Grade Groups with Norms on	
	The Pitch Test	32
XII	Comparison of Grade Groups with Norms on	
	The Loudness Test	34
XIII	Comparison of Grade Groups with Norms on	
	The Rhythm Test	35
XIV	Comparison of Grade Groups with Norms on	
	The Time Test	36
XV	Comparison of the Grade Groups with Norms	
	on the Timbre Test	36
XVI	Comparison of Grade Groups with Norms on	
	The Tonal Memory Test	37

Table	Title	Page
XVII	Comparison of Pawnees, Poncas, and Otoes	39
XVIII	Comparison of Boys and Girls	41
XIX	Comparison of Bearding School Children with	
	Public School Indian Children on the Measures	42
XX	Comparison of Full-Bloods and Less Than	
	One-Fourth Bloods on the Measures	45
XXI	Means and Standard Deviations of Special	
	Uneto Studento	48

vi

CHAPTER I

INTRODUCTION

The purpose of this study is to discover the nature and extent of musical talent as it exists among Indian children who come under the jurisdiction of the Pawnee Indian Agency or/ and live at the Pawnee Indian Boarding School.

1

The average American citizen living outside of states having an Indian population of from two to three per cent of the total population on living near Indian groups receives varied impressions of the characteristics, modes of living, and special aptitudes of this minority racial group. Such impressions are not always based on actual facts or scientific findings. Movies, comic strips, certain fiction and "old wives" tales" may have contributed estimably to many prevalent notions. Many of these notions upon close scrutiny may be misconceptions.

Prior to his association with Indians many well-meaning friends have tried to influence the writer with certain convenient platitudes such as: "Be fair with the Indian, then you will have no trouble"; "Do an Indian a favor once and he will be your friend for life": "You will find the Indian very musically talented": "They certainly have beautiful voices"; "Their voices are beautiful while they are in the primary and intermediate grades, but as they enter adolescence their voices become raspy"; "They are just natural musicians"; and, "They have a very keen sense of rhythm--of course, from their dancing."

The writer has heard more Indian bands then white bands playing lustily but quite oblivious to any necessity for playing in tune with others. Having taught various types of ensembles, vocal and instrumental, the author has observed that lack of consciousness for adherence to certain pitch standards is rather common. One could all too frequently note the students' comparative difficulty in understanding and feeling time values. This may indicate a certain racial deficiency in being able to conform to white standards in respect to exact tone duration and rhythm. The 'lusty' playing may indicate a lack of sensitiveness of feeling for tone quality.

Despite these critical observations, the general public is always impressed by musicales presented by Indian groups. However, the white man prefers to hear Indians perform Indian music. He is very much impressed with Indian ceremonials. People will travel many miles to witness these ceremonials which are unrehearsed pageants. There seems to be a definite fascination that holds people almost spell-bound watching native dances and listening to native ceremonial music. This music is done reverently, with utmost feeling and sensitiveness to pitch, quality of tone, rhythm and time.

This arouses several thought-provoking questions. Do white people, as a race, or a nation, or a social or religious group, find expression of their inner-most longings, desires, hopes, ambitions, gricfs or joys in music or in the dance? Why does the white man, in his schools, have to hire specially trained teachers of music who, daily, and almost vainly, struggle to make music a living thing for children? Why doesn't the white man let himself go into music? Could it be that the white man is surrounded by so many restrictions and conventions or taboos that regulate everything he does so that no time remains for music? Ah, but his kind does love music dearly,

and wants so much to participate in any kind of music expression. One needs merely to watch any small group with common interests proceeding from serious talk to small talk or gossip or tales and finally to song. Recently it was the writer's fortune to be stationed at an induction center for several days. Here, in this maelstrom of personalities, was one lad, age twenty, height five feet two inches, weight over three hundred pounds and an umbilical girth of seventy inches, who originated from an unknown village in the western section of the state. Dressed in overalls, and ignorant of any music training, even unable to discern one note from another, this lad was entertaining five hundred forty selectees by playing (as well as the better popular radio artists) popular and patrictic songs on the piano in every style of modern dance music. Hour after hour he played without diminishing enthusiasm from the crowd. Uneducated and unknown, he had the key to enjoyment of hundreds of others. Yes, one does crave music also as an expression of the inexpressible. But these are isolated instances where we expose our souls to the excitant charm of music. The Indian has always used music for purposes that go beyond the verbal expressions.

The Indian may not be able to perform the white man's music nearly so well as his own, which in turn, the white man cannot reproduce effectively at all. This is natural. Let us remember this when we try to measure Indian talent in music with white man-made scales.

Much of the Indian's music is created for the occasion as was also the music produced by the ancient Grecian bards and the minnesinger of the Middle Ages. The Indian creates and produces music, whereas, the modern white man does well when he reproduces it, or even takes the time to listen to it.

The entire economy of primitive groups is built around worship, song, dance, and ceremonials. Modern existence condemns such an economy as too time consuming, and detaches its existence from its self expression. Modern man relegates his self-expressive activities to set short periods at times when they do not conflict with his mad rush for existence. It is the impression of the writer that more Indians perform Indian music than proportionally the average person performs white music, possibly because the Indian does not let his work hamper his freedom of self expression.

Even today, and in a locality where the Indians enjoy almost all of the opportunities which the white man enjoys, Indian culture provides very abundantly for the expression of the individual through frequent ceremonials, which may take the form of memorial services, prayer meetings, social entertainments, hand games, give-aways, and patriotic celebrations. World War II has contributed tremendously as a motivating factor for more frequent ceremonials. Men and women leaving for the armed forces, home on furlough, about to go overseas, wounded and dead are all feted with ceremonials that cause one to realize the immense amount of feeling that is nurtured for all. Civilization's inroads have not measurably lessened this form of expression. It merely has caused the Indian to express himself with close regard to time limits.

J. H. Salomon says:

"It (music) was used as a means to express every emotion-songs were private property and could only be performed by rightful owners. Though the () Indians performed the dances (and songs) or their neighbors, they did not do so before they had obtained the right to use them by trade or purchase.

Every song, () connected with a ceremony had to be performed correctly, for it was believed that misfortune and divinely inflicted punishment would follow any failure to give a strictly accurate performance.

Music for the dances was furnished by the singing of the dancers and the playing of instruments they carried, or by a separate chorus and orchestra.

Clowns or delight makers relieved the seriousness of the () ceremonies by making merry and doing what mischief they could while the dance was in progress.^{#1}

Instead of dispensing with Indian music with but a few cursory remarks as is done in most history of music texts and courses, the writer would like to take the liberty to suggest that the rough study of this type of native music compared with the Greek drama and chorus, the music of the bards and minnesinger, the Medieval Mystery Play, the development of the Opera and of Christian rituals and Liturgics would indeed be a fruitful study. Musicologists and anthropologists should be able to expand most profitably by the study of native Indian music in relation to other mative music.

The people who participate in or come under the influence of this native music have specific ability to comprehend or enjoy or perform such music. They are to an extent talented. In attempting te discover the nature and extent of musical talent in a specified minority group it is quite important to bear in mind what purpose can best be served. The United States government, society, and the Indian himself have been interested in the problem of honorable survival in a white society. It is expected that the Indian produces for a livelihood. It is desirable that the Indian learn to excel profitably in various fields. If there is found a sufficiently large percentage of Indians with an overwholming amount of salable musical talent, this talent should be encouraged, trained, brought to light, and its results

¹J. H. Salomon, <u>The Book of Indian Grafts and Indian Lore</u>, (New York and London: Harper and Brothers, 1928) pp. 284-5.

دین در باری باری باری ماند این دری بری های باری **وی باری در اور باری ماند در باری داند** ماند.

traded for a livelihood. Very few Indians have become successful professional musicians. No choral or instrumental groups displaying and nurturing purely native music are active professionally and in a lucrative way. If music is one of the fortes whereby the Indian can find himself in this society, let us find out and give him much more opportunity.

In order to find out whether or not Indians have musical talent in a comparable, or even salable amount or extent, it is necessary to resort to fairly accurate standardized measures to discover or verify such talent. Educational and psychological literature records very few instances where an attempt has been made to gain such knowledge.

The writer has undertaken to test for musical talent Indian boys and girls who live within the Pawnee Indian Agency jurisdiction and those attending the Pawnee Indian Boarding School. It is hoped that such a testing program will eventually result in testing all Indian youngsters under the jurisdiction of the federal government, in order to arrive at definite conclusions and be of more specific help to Indians.

CHAPTER 11

SUBJECTS AND MATERIALS USED

War time restrictions made it impossible personally to reach beyond the immediate territory for subjects available for testing. Therefore, this study limits itself to those students attending the largest schools within the bounds of this jurisdiction. However, it is felt that the number tested is a large percentage of the Indian children of this jurisdiction that can be gotten fairly regularly to any school at all.

Two hundred sixty students were selected from four schools. They ranged from grade five to grade eleven, and ranged in age from ten years to sixteen years.

The schools from which these subjects came were the Pawmee Indian Boarding School, Pawmee, Oklahoma, from which one hundred sixty-six subjects were taken, eighty-one of whom were boys and eighty-five, firls; the Pawmee Elementary School, Pawmee, Oklahoma, from which twenty-three cases were taken, sixteen of whom were boys and seven, girls; the Whiteagle District No. 2. School, Whiteagle, Oklahoma, from which forty students were taken, twenty-five of whom were boys and fifteen, girls; and the Red Rock Consolidated School of Fed Rock, Oklahoma, which yielded thirty-one students, seventeen of whom were boys and fourteen, girls.

Table I is intended to portray the grade and sex distribution of the students tested from the four schools.

TABLE I

SCHOOL	Five Total	& S M	ix F	GR Seven Total	ADE & E M	ight F	<u>Ađ</u> Total	ult M	Ĩ	
Pawnee Indian Boarding School	85	49	36	62	26	34	15	Ą	11	
Pawnee Elementary School	7	6	1	5	4	1	12	7	5	
Red Rock Consolidated School	26	14	12	4	2	2	3	0	3	
Whiteagle School District No. 2.	25	16	9	16	9	7				
Potals	143	85	58	87	41	44	30	10	20	

THE GRADE AND SEX DISTRIBUTION OF THE STUDENTS

Table I shows the breakdown of two hundred sixty students to the number attending each of the separate schools mentioned above. It indicates the grade and sex distribution from each school, also the total grade and distribution. The grades were paired into three groups: grades five and six, grades seven and eight, and grades nine, ten, and over. The subjects were divided into these grade groups because the standards that have been set up as the chief criteria of comparison have been based on this grouping. A further breakdown would not serve the purpose more aptly. The table serves more as a picture of the subjects used than as the basis from which all the findings are taken. Table II shows primarily the tribal distribution of all the students tested.

TABLE II

FRIEAL	DISTR	IBUTION	OF TH	IS SUBJECTS
and the second se				

Tribes	Number Tested	
Famee	70	an ng tan gan yanan ng tan gan gan gan gan gan gan gan gan gan g
Ponca	76	
Ûtoe	6 0	
Lav	14	
Tonkawa	13	
Shawnee	9	
Sac and Fox	5	
Zickapoe	4	
Osage	3	
Pottawatomie	2	
Cheyenne	43 #2	
Chicasew	1	· .
Cherokee	1	
Total	260	1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1

No selective plan was used to determine which students were to be tested. Since standards for the tests used were originally set up from the testing of school age youngsters in "run of the mill" fashion, comparable results would be obtained by following the same system with Indian youngsters. Therefore, as many students as possible were tested. The sampling was taken from schools located in each fair sized center within the jurisdiction.

From an ethnological viewpoint it may have been desirable to select only full-blood Indians. However, such a strict grouping would not serve a practical purpose since it would be very difficult to establish what comprises full-bloodedness. One would have to take only those from each tribe that have never mixed with other races, nationalities, or tribes. With the increasing assimilation into white civilization much blood is constantly being mixed, and much has been mixed these four centuries past. It would be as difficult to find a pure stock Indian from any of the Oklahoma tribes as it would be to find a pure stock white from the various groupings of whites. After all, we are trying to measure abilities or characteristics of a race as they appear now and not how they would appear in a very theoretical situation.

The average Indian child living in this jurisdiction comes from a home which one may consider as being quite below standard. The Indian child coming from a home which one considers good or well managed, though humble, is indeed rare.

Reports from the local Educational Field Agent over this jurisdiction indicate that those students enrolled at the Federal Boarding School are especially favored with healthful shelter, food, clothing, and services conducive to good health. When they arrive at the school a good share of the children are inadequately clothed, underfed, and not cared for in other physical and spiritual areas. Facilities are available for him, but the average Indian does not avail himself properly of those things that might help him.

The public schools from which a number of the subjects were drawn try in a limited way to offset these deficiencies.

Almost all of the children have participated in the tribal ceremonials and dances from infancy. They all speak English, although, in many cases, the parents speak the tribal tongue at home and among friends.

None of the children comes from homes where good music is listened to, used, or encouraged (that is, good music according to our standards-after all, we are testing and judging them with our standards for survival in our society). The "gospel song" is the nearest approximation within their realm of appreciation to better music. Dance orchestras are quite well appreciated. Roadhouses, honky tonks, juke boxes, and pool halls produce most of the recreation for a goodly portion of these folk.

The test used to determine the results evaluated in this study was Series A of Seashore's Revised Measures of Musical Talent. This battery of tests was selected as an adequate measure because its entire historical background was as thoroughly scientific and objective as any tests yet devised. These measures were the basis of vastly more talent investigations than the total of all other talent test batteries in existence. The measures have been investigated for reliability and validity more scientifically, impartially, and searchingly by the outstanding leaders in the field and hundreds of others than any combination of the total of other tests of similar nature and purpose.

Certainly, the tests have been found wanting. James Mursell was one of the most cruel and exacting critics of this battery. The inventor, Carl Seashore, admitted the limitation of this battery of tests. He concluded:

1. The tests developed can be administered to large groups.

2. The tests eliminate the effects of practice and training and degree of normal intelligence.

3. The tests are as "fool proof" as any possible to that date.

4. The tests are justified:

a. for the information gathered

b. for the instruction gained through critical training furnished in the hearing of the tests.

5. The tests are so constructed that they measure the inherent components of talent.²

Seashore contended that "music contains nothing that is not in the sound wave." The tests, therefore, do not test more than absolute objective responsiveness of the ear as a receptor to differences in the sound waves. Mursell feels that the test battery measures acoustical rather than musical abilities. Despite this, he gives this battery of tests preference over all others.

The Measures of Musical Talents were the most widely known tests. Carl Seashore completed the first edition in 1919. This edition was recorded by the Columbia Foonograph Company at that time, and was in use for twenty years before the Revised Edition appeared. During this period of twenty years much literature appeared pointing out faults or weaknesses. The author and his collaborators profited by taking into account the many criticisms and suggestions when they made the 1939 Revision.

The original measures contained the following tests:

1. The Sense of Fitch.

والمرتبع ومرجله ومرجله والمراجع المناطقة والمرجلة والمرجلة والمرجلة والمرجلة

2. The Sense of Intensity or Loudness.

²Carl E. Seashore, <u>The Psychology of Musical Telent</u>, (Boston, New York: Silver Burdett Co., 1919) pp. 1-288.

- 3. The Sense of Pine.
- 4. The Sense of Consonance.
- S. The Sense of Rhythm.
- 6. The Musical Monory Test.

The Consenance Test³ was omitted in the 1939 Revision since it was found to have bat negligible diagnostic value. It was difficult to determine whether judgments were affected by harmonic progression, belodic sequence, or by feelings of like and dislike. In its place was substituted a timbre test. The Time and Rhythm Tests were considerably modified since in previous investigations, especially one by Farnsworth,⁴ these two tests were found to have comparatively low reliabilities.

The authors of the revised measures admitted that many tests that have the essense of appearing essential have been omitted. Their final decision in what to include or exclude rested primerily upon the basic purpose of the battery: neaely, the measurement of aptitudes as distinguished from achievement. In the 1939 Revision no attempt was made to permit discovery of the actual threshold of difficulty in judgments. The Series A Measures were designed primerily for "dragnet" purposes. However, Series B is arranged so that more discriminating testing can be accomplished. Thresholds of discriminatory differences are marked sufficiently on the respective records that the tester can easily, by reising the meedle from the record and bringing it to a

⁴P. Farnsworth, "Are Music Tests More Exportant Than Intelligence Tests in Prediction of Several Kinds of Music Grades," <u>Journal of</u> <u>Applied Psychology</u>, XIX (June, 1935), 347-350.

³Joseph G. Sastveit, Don Lewis, and Carl E. Seashore, <u>Revision</u> of the Seashore <u>Measures of Musical Talent</u>, (University of Iowa Studies, No. 65. Jowa City: University of Iowa Press, 1940).

certain starting place, test most exhaustively within the scope of each threshold.

The equipment which provided the source from which the recordings were made which were included in this test battery will be discussed briefly.

The Fitch Test⁵ was developed by use of a General Radio beat frequency oscillator, Type 613-B with an attached incremental frequency condenser, Type 539-S.

The same source was used to develop the Time test. The equipment was, however, gauged to 440 cycles. The time or duration factor was controlled by a tape-timing apparatus.

A generator of electro-static type was designed to measure one's ability to recognize differences in tone quality. This tone generator was designed by Dr. M. J. Larsen in the University of Iowa laboratory. With this instrument it was possible to produce as many as 16 consecutive harmonics. A varied combination of six partials was used in the timbre test at each change in tone quality.

Two oscillators, the beat frequency instrument and the General Radio oscillator, Type 377-B were used to produce the stimuli for the rhythm test.

The Tonal Hemory Test was produced on a Hambond organ as played by a competent musician.

One can readily appreciate the significant strides that have been made in producing an accurate and controlled test as compared with

⁵Sactveit, Lewis, and Seashore, <u>op</u>. <u>cit</u>.

"the best available test to date" of twenty years ago. Compare the sources of the 1939 Revision with the sources of the 1919 battery: the tuning fork, the Galton Whistle, audiometers, and other relatively crude instruments used. It is of noteworthy interest that no human hand touched or influenced any of the equipment used in the Revised test during the final recording by the R. C. A. Co., except the Tonal Memory Test, and there the criterion was utmost competence of the performer.

In a mechanical way the equipment was handled in as foolproof and controlled a manner as humanly possible. Two relatively uncontrolled factors remain. They are, of course, the test administrator and the subject. It is more important to possess rapport and a feeling of well-being in the successful performance of this test battery than in the usual type of paper and pencil test. The object of this test is not to express knowledge as a result of either experience or learning, but to express a sample of innate ability or an innate reaction to a sound stimulus. The machine, the administrator, the ear and the subject must willingly meet on common ground to produce reliable results. Were it possible to control the administrator and the subject as one can do to the reaction of a machine, the result would be unreliable since it would be too much like testing robots. Such mechanical creatures have no need for being tested for certain aptitudes; they are manufactures with perfected standardized specific aptitudes. It is the flexible, evasive, and intangible human mind and soul that one wishes to grasp, if but for a short while, and measure its musical content.

The materials that were used to test these Indian children were in perfect condition.

The test itself had been purchased new from a reliable and nationally known music wholesale house. It comprised six records with twelve sides. Series A, or the first three records containing the six tests, was used in connection with this study. No particular need was felt in using Series E, neither would the aims be accomplished more thoroughly thereby.

The test blanks were mimeographed copies of the blanks recommended in the Manual of Instructions and Interpretation. Several pertinent questions were added to the test blank. The questions were intended to elicit such information as name, age, grade, school, parent's occupation, tribe, degree of Indian blood, previous music training in school, or private music instruction, and preference for type of music.

A specially overhauled R. C. A. radio-phonograph was used. To this was attached one of the more expensive brands of chromium pointed needles.

The Pitch Test contained fifty trials arranged in five groups with ten trials in each group. A rest pause was provided on the recording between each group of ten trials. The subject was asked to judge whether the second tone produced in each trial was higher or lower than the first. The symbols "L" and "H" were used to indicate the subject's judgment on the test blank.

The test itself increased in difficulty by means of a gradual lessening of the cycles of frequency differences from seventeen cycles to one cycle. The tests increased in discriminative difficulty as follows:

five trials with seventeen cycles difference between both tones seven trials with twelve cycles difference between both tones ten trials with eight cycles difference between both tones ten trials with five cycles difference between both tones eight trials with four cycles difference between both tones five trials with three cycles difference between both tones five trials with two cycles difference between both tones

In keeping with the terminology adopted by the Acoustical Society of America the Intensity Test was remaned Loudness.⁶ The same number of trials and the same convenient grouping for the subject exists in this test as in the previously described test. The subject was required to record whether the second tone in each trial was stronger or weaker than the first tone, using the symbols "S" and "W" for stronger and weaker, respectively.

This test increased in difficulty by gradually lessening the decidels of difference in intensity between the tones of each trial, as follows:

five trials of 4. decibel difference five trials of 2.5 decibel difference ten trials of 2. decibel difference ten trials of 1.5 decibel difference ten trials of 1. decibel difference ten trials of .5 decibel difference

The Time Test also has fifty trials grouped into five equal groups. The subjects judged the second tone of each trial to be either longer

⁶<u>Ibid.</u>, p. 18.

or shorter than the first, recording his judgment with the symbols "L" and "S" for longer or shorter, respectively.

The test increased in discriminative difficulty by decreasing the difference in duration of seconds from .3 of a second to .05 of a second, as follows:

five trials at .3 second difference five trials at .2 second difference ten trials at .15 second difference ten trials at .125 second difference ten trials at .1 second difference five trials at .075 second difference five trials at .05 second difference

The Timbre Test is, by far, the most complex in structure. The subjects are required to judge fifty pairs of tones as to whether or not the two tones in the pair have the same sound to the car or a different sound. The subject indicates his judgment with "5" and "D" for same or different, respectively. Six harmonics were used in producing a certain tone. The third and fourth harmonics were altered in intensity in each trial, thereby creating a difference in timbre, as follows:

TRIALS	4th MARMONIC INCREASED IN INTENSITY	3rd Harmonic Discreased In Intensity
1 - 10	10. decibels	9.6 decibels
11 - 20	8.5 decibels	4. decibels
21 - 30	7. decibels	2. decibels
31- 40	5.5 decibels	1.2 decibels
41 - 50	4. decibels	.7 decidels

The Rhythm Test used thirty pairs of rhythmic patterns. The subject was required to decide whether the two patterns in each trial were the same or different, by indicating with the symbols "S" and "D", respectively. The test was recorded originally at the rate of ainstytwo quarter notes per minute.

The following sample illustrates approximately how these pairs of rhythmic patterns were constructed. Are these two the same or different?

Of course one can readily see that the items of this pair are different, however, upon hearing such a succession of patterns the judgment may alter with the individual, since these impressions ride into the car on sound waves. The following is a listing of the grouping of the types of patterns used:

NUMBER OF TRIALS	NUMBER OF TONES PER RHYTHNIC PATTERN	TIMA VALUE
10	5	2/4
10	6	3/4
10	7	4/4

In the Tonal Memory Test the subject needed to judge upon repetition of a three, four, of five tone (or span) melody, which tone differed from the original rendition. The subject indicated on the test blank which tone was altered, by using the following numers: 1, 2, 3, 4, or 5.

"O'Connor recently made an analysis of the items in the ariginal memory test. His work was based upon the responses of eight hundred observers. His major conclusion was that, in general, the relationship between the difficulty of an item and the number of notes in it can be expressed by the equation Y equals GX², where Y is the number of errors, C is a constant, and X is the number of notes. He also found that changes in the last note of a span were approximately twice as easy to perceive as changes in the first note. His analysis also indicated that the difficulty of an item varied directly with both the number of turns in the melodic pattern and the size of the interval between the adjacent notes of the pattern. This analysis provided a basis for selecting items for this Revision. Differences in tonal pattern depended upon full-step rather than half-step changes in order to reduce the correlation between Tonal Memory and Pitch tests."⁷

The trials were arranged in increasing difficulty as follows: ten trials of three tones in a melody span ten trials of four tones in a melody span ten trials of five tones in a melody span

The preceding material is a description of only Series A of the Seashore Measures of Musical Aptitudes, since Series B was not used in this study.

7<u>Ibid.</u>, pp. 30-31.

CHAPTER III

PROCEDURES USED

All students in grades five to nine attending the Farmee Boarding School at Parmee, Oklahoma, were tested. The Indian children from grades five to eleven attending the Rod Bock Consolidated School, Rod Rock, Oklahoma, the Indian children attending the White Engle, District No. 2 School, White Engle, Oklahoma, grades five to eight, also a number of available Indian children anrolled in the Parmee Public Schools at Parmee, Oklahoma, were tested.

In the case of the children of the Parmee Rearding School, each grade was tested separately and in the home room of the respective grade. When the testing was carried out in the other schools the children from the named grades were sent to an assembly room where all the desired grades were tested together. The few shildren from the Parmee Mementary School were tested at the Boarding school, some at the same time with the others at the Boarding school, the rest on a Saturday morning.

Wherever the testing was done it was done immediately after the commencement of the school day, or immediately after the noon recess. This gave each child the opportunity to present himself for testing as fresh and as alert as humanly possible. This also reduced to a minimum the possible enticipated disturbance caused by students leaving the room during the testing.

Permission to administer these tests was obtained by writing to the respective principals and superintendents. They also made available the room and the desired time and saw to it that the students were released from other school work for this testing. The actual testing procedure in each of the nine rooms, with children from four schools, was quite alike. Two major problems had to be taken into account. They were proper rapport and avoiding fatigue.

The obtaining of proper rapport, i. e. creating, developing, and sustaining interest, seems to have constituted a major problem in the successful administering of the test battery to the Indian youngsters.

While it is of doubtful value to this report to decide whether the Indian children of this group are naturally reticent by reason of their race, cultural level, or rural life, nevertheless the problem had to be overcome. Therefore all directions were given greatly simplified. The experimenter went to great length to make certain that each child was confident in his own mind how to procede when the test actually started. To assure himself of this, several students were asked to repeat the directions for procedure orally. A few were asked to demonstrate at the blackboard how the symbols were to be placed on the blanks.

The experimenter at first demonstrated vocally approximately how the test would sound to the subject. Thereupon he asked the group to give their answer or judgment orally as group response. After several vocally produced trials the subjects were given at least twelve practice trials from the recordings. This was followed by group oral response, or individuals were asked to respond. Their judgment was either agreed to or corrected by the group. This practice in no way helped the performance of the test to the extent of making scores favorably unreliable. It was a matter of equal time and equal practice to overcome known and apparent reticence.

Great care was taken to explain, especially to the older students, that the results in no way would affect the music grades on their report cards. This problem of suspicion seems to have arisen at the Boarding School where the subjects live together in dormitories and have the opportunity of conditioning each other favorably or unfavorably for certain events.

In order to avoid fatigue as much as possible the experimenter raised the needle from the record at each rest period after ten trials to provide a longer period of rest, in order to give each student a better chance to regain composure after the strain of ten trials. This in no way affected the time element of the test since only the rest periods of each test were extended. Most of the subjects, seemingly by nature, were a trifle slower than average in performance, possibly because of a lack of a need for fast work, or by reason of their rural life.

These careful directions were reiterated before each of the six tests. Also, a five-minute relaxation and refresher period was proclaimed after the third test. Ideally, it may have been better to have given one-half of the test battery on one day, and the other half on another day. However, as previously mentioned, war-time travel and time restrictions prevented this.

The Manual of Instructions and Interpretations for the Seashore Measure of Musical Talents suggested repeating the test in order to obtain a higher reliability. This was not done because of the time limitation. However, this suggestion was offset in that the experimenter utilized the allotted time by making certain that each child understood for what he was to listen, how he was to judge, how he was to translate

the judgments into symbols, and how he was to record the symbols.

Twenty-six subjects from the fifth and sixth grade group were retested. However, the results did not warrant general retesting. The group that was retested was by far the most difficult to prepare for the test.

The experimenter, before administering the test to others, tested himself on each test three times, following such testing with Series B. At each retesting, various types of disturbances and interruptions were experienced. These disturbances did not affect the high level of performance set by the initial test, neither did the scores of the tests improve noticeably by retesting. The results of Series B were as good as the results on the Series A. The experimenter had never administered this test prior to this time to any individual or group, neither had he ever been tested with this or any similar music talent test before. His only interest was in doing a good test after an understanding of the direction, with a certain amount of disturbance in order to ascertain just what conditions really were essentially necessary in order to administer the test successfully.

Such matters as proper ventilation, room temperature and light were checked before any group was tested. Sufficient comfortable desk space was provided for each student. Each student was provided with a sharpened pencil. All students were in apparent good health, none suffering visibly from any respiratory ailments that might affect auditory discrimination.

The subjects were asked to close their eyes while listening, and open them merely long enough to record their judgments.

The test proceeded with perfectly controlled equipment and good or ideal physical environment, a well trained and experienced test administrator and groups who had been conditioned to doing a good job under the best possible circumstances. It is doubtful whether results from testing a large group of two or three hundred at the same time could hope to be more reliable.

The general directions for procedure were followed, however, in the above mentioned simplified modified form. The entire experiment lasted, in each case, approximately one hour and thirty minutes. This included rest periods, recess and explanations. The test can be performed without these in about thirty-five minutes. This is the length of time the experimenter allowed himself when he tested himself with both Series of these measures.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF FINDINGS

In Chapter II the writer gave a complete description of the groups that were tested. The total number of subjects was broken down into grade, sex, school and tribal groups. The present chapter will deal firstly in recording the findings in terms by which the recognized and accepted standards have been set up. Thereupon the findings will be separated into groups for comparison. The findings of each test will be found on separate tables.

TABLE III

PITCH

GROUP	Total Number Tested	MEAN SCORE OF % CORRECT	S. D.
All Groups	260	58.5	13.72
Grades 5 & 6	142	55.3	10.63
Grades 7 & 8	87	59.7	13.96
Grades 9, 10, & Adult	29	65.	13.54
Pawnees	70	58.2	12.3
Poncas	76	57.5	14.8
Otoes	60	55.5	14.58
Male	140	57	13.65
Female	120	60.5	15.46
Public School Indians	98	57	15.13
Boarding School	162	59.4	14.79
Music Students	22	70.4	8.5
Full Blood	30	62	19.39
Less than $\frac{1}{4}$ Blood	26	63.5	11.64

The reader will please note that these tables include merely the facts from which all implications will be gleaned later in this chapter. The standardized norms which are the bases for comparison will be listed along with the implication. These tables merely intend to list the

number tested in each group, the respective mean score of per cent

correct, and the respective signas.

TABLE IV

LOUDNESS

GROUP	TOTAL NUMBER TESTED	MEAN SCORE OF % CORRECT	S. D.
All Groups	260	66.94	13.3
Grades 5 & 6	142	63.2	11.2
Grades 7 & 8	89	66.5	14.18
Grades 9, 10, & Adult	29	70	11.78
Pawnees	70	65.8	11.46
Poncas	76	69.9	13.94
Otoes	60	67.5	12.2
Male	140	66.8	13.38
Female	120	68.5	12.78
Public School	98	68.7	14.58
Boarding School	162	66.3	12.86
Music Students	22	76.9	6.7
Full Blood	30	68.7	14.9
Less than 1 Blood	26	67.6	12.45

TABLE V

RHYTHM

GROUP	TOTAL NUMBER TESTED	MEAN SCORE OF % CORRECT	S. D.	
All Groups	260	68.9	15,27	
Grades 5 & 6	142	67.3	15.6	
Grades 7 & 8	89	71.5	12.2	
Grades 9, 10, & Adult	29	66	17.95	
Pawnees	70	67.1		
Poncas	76	70.5	14	
Otoes	60	67.8	14.92	
Male	140	67.7	13.92	
Female	120	69.5	14.3	
Public School	98	67	15.95	
Boarding School	162	70	13.47	
Music Students	55	78.2	8.4	
Full Blood	30	71.8	11.97	
Less than 1/4 Blood	26	71	14.86	•

TABLE	VI.
And an extension statements	

TIME

GROUP	total number Tested	MDAN SCORE OF % CORRECT	Š. D.
All Groups	260	65.1	11.49
Srades 5 & 6	142	63.9	11.61
Frades 7 & 8	89	66.2	13.8
Grades 9. 10. & Adult	29	68.5	10.6
Pawnees	70	64.8	9.8
Poncas	76	66.4	10.98
ltoes	60	63.2	11.7
	140	62.6	13
female	130	65.3	10.55
Public School	98	64.3	10.81
Boarding School	162	65.3	12
Jusic Students	23	75	6.4
full Blood	30	61	10.48
less than 1 Blood	26	64.6	9.8

TABLE VII

TIMBRE

GROUP	Total Number Tested	MEAN SCORE OF S CORRECT	s. p.
All Groups	260	67.5	13
Grades 5 & 6	142	62.9	11.5
Grades 7 & 8	89	68	10.65
Grades 9, 10, & Adult	29	64.5	11,85
Pawnees	70	65.5	11.58
Poncas	76	65	11.3
Otoes	60	63.8	11.57
hale	140	64	11.09
Female	120	64.9	10.75
Public School	98	60.3	14.63
Boarding School	162	67.5	14
Music Students	32	74.5	7.28
Full Blood	30	70	9.35
Less than 🛔 Blood	26	68.5	12.61

GROUP	total number Tested	MEAN SCORE OF & Correct	
11 Groups	260	51.3	10
mades 5 & 6	143	44.9	15.3
Frades 7 & 8	89	56.5	20.5
hades 9, 10, & Adult	29	64.5	14.34
Pamoes	70	51.2	13.98
oncas	76	51	19.33
ltoes	60	50.63	18.89
lale	140	49	18
lemale	120	52.9	20.8
Aublic School	98	49.3	19.44
Bearding School	162	51.9	15.52
msic Students	88	67.3	14.7
ull Blood	30	55.6	20.37
less than 1 Blood	26	59	15.9

TOMAL MEMORY

-

TABLE IX

RANGE OF SCORTS ON ALL SIX TESTS FOR MACH GROUP

GRCUP	PITCN	LOUDNESS	RHYTHM	TIMA	RE-TINE	MANORY
All Groups Grades 5 & 6 Grades 7 & 8 Gr. 9, 10, & Adult Pawnees Poncas Otoes Male Female	17-96 21-92 17-96 37-92 37-84 17-96 21-84 24-88 21-96	21-96 21-96 25-96 45-88 29-88 21-96 37-88 21-96 25-96	29-99 29-96 33-97 29-99 37-99 29-99 37-96 37-96 29-99 29-99	17-96 21-96 17-88 49-88 41-92 29-96 41-88 17-96 37-88	21-96 17-88 25-96 41-88 29-92 41-88 41-96 37-96 25-96	9-100 13-100 9-100 17-100 17-100 9-100 13-92 13-96 9-100
Public School Boarding School Music Students Full Blood Less than 2 Blood	17-96 33-92 51-85 41-85 36-85	21-96 29-96 61-96 31-95 51-90	29-99 29-99 61-95 46-99 36-95	37-88 17-96 51-85 36-85 46-85	21-96 17-96 61-95 51-95 41-90	9-100 9-100 36-100 11-95 11-90

One can very easily find vest differences in results when one compares the white norms in Table X with the results of like groups in Tables III to VIII. The scores on these norms are decidedly higher throughout then the Indian scores.

The mean scores of per cent correct in Table X seem to cluster within a close range in comparison with the disproportionate condition that exists in Tables III to VIII in reference to the Pitch and Tonal Memory tests.

The signas in Table X are nearly the same as those in Tables III to VIII. However, the sigmas for the Shythm test on the Indian scores are larger, by fer, then those for the Bhythm test in Table X. The sigmas on the Tonal Nemory tests, Tables VIII and X, are both apparently disproportionately larger than the signas on the other tests. The Indian signas in these two tables are even larger than those on the white norms. These two facts seem to indicate a multi-modal situation, or a rectangular distribution, without a clearly defined clustering about a central point or mode. This may indicate that the type of memory tested in this battery is quite unevenly distributed; that it is just as likely to have almost as many cases near the extremes as at the means. Or, let us say, out of one hundred fifty cases, one could discover fifty cases ranging around Q1, fifty cases ranging around 93, and the remaining cases occupying the center of the distribution.

By glancing quickly at Tables III-VIII one can gather that the results of the Pitch and Tonal Memory tests are quite out of proportion to the results on the other tests. The mean score of per cent correct is much lower on these two tests. However the scores from the ninth

and tenth grade group on these two tests and the special music students group are proportionately much higher. The Fitch, Rhythm, and Tonal Memory Tests have the highest Standard Deviations, with the Tonal Memory Test leading the two others. The range of scores on the Tonal Memory Tests is consistently the greatest of all tests for all the groups. This test seems to be weighted with an unproportionately large number of scores at the extremes.

8 TABLE X

MEANS AND STANDARD DEVIATIONS FOR THE SEASHORE MEASURES

TEST	ORAN No.	DRS 5 Mean	<u>& 6</u> S.D.	GRA No.	DES 7 Mean	<u>& 8</u> S.D.	GRAD No.	IIS 9 & Mean	ADULT S.D.
Pitch	1538	69.9	12.9	1275	72.2	13.4	1071	75.9	12.2
Loudness	1705	70.7	10.3	1352	74.1	10.2	1087	81.4	10.8
Rhythm	1644	73.6	10.9	1192	77.4	10.4	1104	83.5	9.2
Time	1606	68	10.3	1217	70	10	1116	76.8	9.7
Habre	1536	68	10.4	829	70.6	10.3	8 52	75.1	9.7
Tonal Memory	1472	67.6	17.7	1064	69.6	17.9	980	83.3	13.5

Tables XI to XVI will show to what extent the Indians tested compare with the norms set up in the Revision of the Scashore Measures.

It is easy to see that differences do exist, but the following analysis will attempt to show the significant or real differences when and if they exist. The formulas used to calculate the real or significant differences are:

8<u>Ibid.</u>, p. 34.

or

⁹1. The reliability of the mean, or, the standard error of the mean (6_{M})

$$6_{\rm M} = \frac{6}{\rm V N}$$

2. The reliability of the difference between two means, or, the standard error of the difference when means are uncorrelated (6_D)

$$6_{\rm D} \text{ or } 6_{\rm N1} - M_2 = \sqrt{6^2 M_1 \text{ plus } 6^2 M_2}$$

 6_{M_1} in the following analysis will represent the higher of the two means, and 6_{M_2} will represent the lower of the two means under comparison.

3. The significant difference,

TABLE XI

 $\frac{D}{60}$

PITCH

	<u>GRADES</u> Indian	<u>i 5 & 6</u> White	<u>GRADES</u> Indian	57 <u>&8</u> White	<u>GRADES</u> 9 Indian	& ADULT	
Number	142	1538	87	1275	29	1071	
Mean Score	55.8	69.9	57.9	72.2	65	75.9	
s. D.	10.63	12.9	13.96	13.4	13.54	15.5	
<u></u> 6D	15.3		g	.2	4.3		

Three definite comparisons are made in Table XI. The first comparison is between grades five and six of the Indian children tested and grades five and six of the norms set up by Seashere and his

⁹Henry E. Garrett, <u>Statistics in Psychology and Education</u>, (London, New York, Toronto: Longmans, Green and Co., 1937) p. 211. collaborators. This table deals only with the Pitch test.

 $D/6_D$ represents the significant or true difference. Since a $D/6_D$ of 3. or more represents a difference of "virtual certainty" it follows that the $D/6_D$ or significant difference between the Indian and white means, which is as high as 15.3, is a true difference. This means that any $D/6_D$ greater than 3. definitely indicates that the true difference is greater than zero. The result 15 gives this just so much additional security. It is, therefore, likely that these Indian children from grades five and six are definitely inferior to the white children used in the norms of the same grade.

This significant difference of "virtual certainty" diminishes in the comparisons of grades seven and eight, and still more in the comparisons of grades nine and above. However, the respective difference of "virtual certainty" 9.2 and 4.3 are real and very certain. Two questions arise in interpreting the diminishing certainties with advance in age or schooling:

1. Does test performance improve with age and schooling among Indian children? (of course, in respect to Pitch)

2. Does hearing acuity improve with age or schooling?

3. Does Pitch discrimination improve with age or schooling?

In answer to this one could say that the norms set up in the Revision take a liberal amount of maturation into account. Therefore, separate norms have been set up for different grade levels. These norms are our measuring stick. In venturing an answer to this problem of decreasing "virtual certainty" difference, one could say that the average Indian child tested has not, because of environmental factors, developed the powers under scrutiny in that grade as the white child

tested by Seashore. He started, as it were, in a race a number of paces behind the beginning line. He is increasing as he matures. Add to the Indian child more years of experience in white society, and more years of white man's education, he may, according to indications, either approach a condition where no significant difference exists, or even where he overtakes and surpasses white man, in Pitch acuity. This suggestion, however, constitutes a problem for an entirely separate piece of research which may prove fruitful.

TABLE XII

LOUDNESS

	<u>GRADE:</u> Indian	<u>3 5 & 6</u> White	<u>GRADES</u> Indian	7 <u>2 8</u> White	<u>GRADES 9</u> Indian	<u>& ADULT</u> White
Number	142	1705	37	1352	29	1087
Mean Score	63.2	70.7	66.5	74.1	70	81.4
s. D.	11.2	10.3	14.18	10.2	11.78	10.8
<u>D</u> 6p	7.7		4.9		3.45	

The three comparisons with norms on the Loudness show a certain difference, 7.7, 4.9, and 3.45, respectively, for each of the grade groups. This means that there is a difference of "virtual certainty", that the Indian children tested are inferior to the norms in respect to discriminating degrees of loudness. The decreasing difference situation as in the Pitch test prevails. The mean improves with maturation at nearly the same rate with these Indians as among the whites in the norms.

TABLE XIII

RHYTHM

	GRADES 5 & 6		GRADE	5768	GRADES 9 & ADULT		
	Indian	White	Indian	WAILE	Indian	White	
Number	142	1644	87	1192	29	1104	
Mean Score	67.3	73.6	71.5	77.4	66	83.5	
s. D.	15.6	10.9	12.2	10.4	17.95	9.2	
D 6p	4.6		4.	4.4		4.3	

The Rhythm test on Table XIII shows that the actual difference seems to decrease between whites and Indian children as they advance in grade groups. The mean scores increase with age for both Indians and whites; however, the mean score on grade nine and above take a definite drop with the Indian group. This may indicate that if rhythm is a special aptitude of Indians, rhythmic aptitude shows itself at an early age in native form but diminishes as the Indian associates more and more in white society. This is an assumption from figures, and again, is seed for further study.

The significant difference on Table XIV of 2.5 is sufficiently close to 3. to make a virtual difference. In fact, ninety-nine chances out of a hundred the difference would remain real in favor of the white norms no matter how many cases would be added to the number of Indians tested. In other words, it is very problematical whether it is possible to increase the reliability of the Indian means by adding more cases.

	GRADES Incien	5 & 6 White	GRADES Indian	7 & 8 White	GRADUS 9 Indian	& ADULT White	
Number	142	1609	87	1217	29	1116	
Mean Score	63.9	68	66.2	70	68 .5	76.8	
S. D.	11.6	10.3	13.8	10	10.6	9.7	
D 83	4.:	59	2.1	5	4.	32	
, nën ja jun doministra da pasa sa sa sa sa sa sa sa sa	and a finite of the set	TABL	e XV	, <u>2994 (1997)</u> - 1997 (1997)	ee da na magana na maganga na maganga ka mag	44 0 τ το από τ <mark>α πολογορία στο ματρογρ</mark> αφορία το ματρογραφόρια το ματρογραφόριο το ματρογραφόρισται το ματρογραφόριο το ματρογραφόρισ Το ματρογραφόριο το ματρογραφόριο το ματρογραφόριο το ματρογραφόριο το ματρογραφόριο το ματρογραφόριο το ματρογραφόρι	
		TIMER					
	GRADUS Indian	<u>5 & 5</u> White	<u>GRADES</u> Indian	7 <u>& 8</u> White	<u>GRADES 9</u> Indian	<u>& ADULT</u> White	
liunder	142	1644	87	829	29	852	
Nean Score	62.9	68	68	70.6	64.5	75.1	
s. 2.	11.5	10.4	10.65	10.3	11.85	9.7	
D 69	5.1		6	6.9		5.8	

The differences are real for grades five and six and grades nine and above, as indicated by 5.1, 6.9, and 5.2, respectively.

It is readily noticeable from Table XVI on Tonal Memory that the scores of the Indian children do not approach those of the norms. The differences are true significant differences. One can see that a great amount of maturation takes place in this test. This test

TABLE	XVI
- A COLORADO AND A CO	

TONAL MEMORY

	<u>GRADE</u> Indian	<u>35&6</u> White	<u>GRADE</u> Indian	57 <u>&8</u> White	<u>GRADES 9</u> Indian	& ADULT White	
Number	142	1472	87	1064	29	980	
Mean Score	44.9	67. 6	56.5	69.6	64.5	83.3	
S. D.	16.3	17.7	20.5	17.9	14.24	13.5	
D 6D	15.9		5.	5.8		6.9	

seems to depend more on maturation than any of the other five tests. The scores on grades five and six, also on seven and eight, could approach the same mean almost by hit and miss guess-work. Although, this is unlikely with so large a sampling. The results indicate either that the test was not understood properly or that this type of talent is not an inherent capacity among Indian children. Obviously, this capacity grows proportionately from grade group to grade group. Age demands a need for a keener memory from any group of people. This can be seen on the white norm also.

The signas from the norms of the Indian children seen to indicate a rather unusually wide range above and below the mean score of this type of memory capacity. When the adult group is approached there appears a lessening of the range of dispersion.

In general, the Indian children rated below the norms set up by Seashore and his collaborators on all six tests. Although the numbers in the individual groups tested were very much smaller than the number of cases used in setting up of the standards, nevertheless the significant differences are in almost all cases over 3. signifying virtual certainty of differences irrespective of an increased number of cases in like circumstances.

The major portion of the comparisons are herewith concluded. Now will follow several comparisons which may have some value, such as:

1. Comparison of musical talents among three larger tribes represented. (Pawnees, Poncas, and Otoes)

2. Comparison of musical talents between the Indian boys and girls.

3. Comparison of musical talents between Boarding School Indian children and Public School Indian children.

4. Discussion of the musical talents of Indian children who have been recognized as possessing better than the average music ability.

5. Comparison of the musical talents of a number of full-blood Indians with a number of less than one-fourth blood Indians.

For Table XVII the Indian children tested were divided according to tribes. The three tribes having the largest number of test participants were selected for special consideration. There were not sufficient numbers of the other tribes available in order to form reasonably reliable conclusions about them. Besides the problem of sufficient numbers, these three tribes are less mixed with other tribes or white blood than many other local Indian groups.

The following series of statements can best sum up any important points of comparison on Table XVII.

1. The Pawnees, Ponces, and Otoes do not differ essentially or sufficiently in any of the six talents in respect to their mean score of number correct.

and a second second Second second	na an a	n a The Differing Space for the School part of Theorem School providers and the School part of the School part Manual School Particle School Differing and the School part of the School part of the School Particle School par	yjer seles fan Min yn Berninski her fan Staan fan Staan yn Staan yn Staan yn Staan yn Staan yn Armenikaes fan S De fan Ministrike Staan fan Staan yn Staan gestaan staan se se staan yn staan se sen Staan Staan yn Staan yn St	nije i stanovno zakon president se	nantin minanting kanin manya ina panjangan na mpanjakan kanya panjakan na mananya na sama na mananya. Na minangan kanya na mananya mpanjaka na mananya mananya mananya mananya mpanjaka mpanjaka na mpanjaka na mpanja	n an
	Pawnee	PI TCH Ponca	Otoo	Pawneo	LOUDNESS Ponca	Otoe
Number Mean Score S <u>D</u> D. 6D	70 58.2 12.3 Ponca .3 Otos 1.08	76 57.5 14.8 Pawnes .3 Otoe .8	60 55.5 14.58 Fatmee 1.08 Ponca .8	70 65.8 11.46 Ponca 1.4 Otoe .8	76 69.9 13.94 Pawnee 1.4 Otoe 1.	60 67.5 12.2 Pawnee .8 Ponca 1.
	Pawneé	REYTHM Ponca	Otos	Pauneo	ti inf Ponca	Otce
Number Mean Score S. D. D 6D	70 67.1 11.98 Ponca 1.6 Otoc 1.17	76 70.5 14 Pawnge 1.6 Otoe .24	60 67.8 14.92 Parmee 1.17 Ponca .24	70 64.8 9.8 Ponca .9 Otoe .8	76 66.4 10.98 Paymos .9 Otos 1.6	60 63.2 11.7 Parmoe .8 Ponca 1.6
	Pannoo	TI BRE Pomos	0'toe	TOI: Pawnco	al lenory Ponca	Otoa
Number Mean Score S. D. D SD	70 66.5 11.58 Ponca .1 Otoe 1.7	76 65 11.3 Pawnec .14 Otoc .78	60 63.8 11.57 Pawnse 1.7 Ponca .78	70 51.2 13.98 Ponca .07 Otoe .19	76 51 19.33 Pawnee .07 Otoe .1	60 50.63 18.89 Pawnee .19 Ponca .1

PANETEE, PORCA, OTOE

2. The true differences on the Pitch test indicate that the Poncas and Pawnees differ less than the Poncas and Otoes. The Pawnees and Otoes differ more than the other two pairs. The Pawnees had the highest mean score; the Otoes had the lowest.

3. The true differences on the Loudness test indicate that the Pawnees and Poncas differ more than the Otoes and Poncas. These two pairs differ more than the Otoes and Pawnees. The Poncas had the highest mean score; the Pawnees had the lowest.

4. The true differences on the Rhythm test indicate that there is more of a difference between the Pawnees and Poncas on this test than on the Pitch or Loudness tests, and also, than between the Otoes and Pawnees. There is the least difference between the Otoes and Poncas. The difference of 1.6 between Pawnees and Poncas indicate 94 in 100 chances that the true difference is greater than zero. The Poncas had the highest mean score; the Pawnees had the lowest.

5. The true difference on the Time test indicates that the Pawnees and Poncas, also the Pawnees and Otoes, differ less than the Poncas and Otoes in this respect. The Poncas had the highest mean score; the Otoes had the lowest.

6. The true difference on the Timbre test indicates that the Pawnees and Poncas, also the Poncas and Otoes differ less than Pawnees and Otoes. The Pawnees and Otoes approach a significant difference with 1.7 or 96 in 100 chances that the true difference is greater than zero. The Pawnees had the highest mean score; the Otoes had the lowest.

7. The true differences on the Tonal Memory test indicate that the Pawnees and Poncas differ less than the Poncas and Otoes, also

that the Pawnees and Otocs differ more than the other two pairs. The differences in all the pairs are, however, so negligible that they are not sufficiently important to note except for the sake of petty argument. The Pawnees have the highest mean score; the Otocs have the lowest.

No definite reason can be affixed to these obtained and true differences. No explanation can be forthcoming since there is a definite lack in consistency of superiority when comparing these three tribes.

TABLE XVIII

BOYS AND GIRLS

	P Boys	ITCH Girls	LOUI Boys	DNESS Girls	RH Boys	YTHM Girls
Number	140	120	140	120	140	120
Nean Score	57	60.5	66.8	68.5	67.7	69.5
S. D.	13.65	15.45	13.38	12.78	13.92	14.3
<u>р</u> бр	· · · · ·	1.9	1.	.05		.7
and the second sec	TIME Boys Cirls		TIMBRE Boys Girls		and the second secon	the second s
	m Boys	IMB Girls	T. Boys	MBRE Girls	Tonal Boys	MEMORY Girls
Nunber	g Boys 140	IMB Girls 120	Ti Boys 140	(MBRS Girls 120	Tonal Boys 140	MEMORY Girls 120
Munber Mean Score	g Boys 140 66.6	IMB Girls 120 65.3	T Boys 140 64	MBRE Girls 120 64.9	Tonal Boys 140 49	MEMORY Girls 120 52.9
Number Mean Score 5. D.	Boys 140 66.6 13	IMB Girls 120 65.3 10.55	T Boys 140 64 11.09	MBRE Girls 120 64.9 10.75	Tonal Boys 140 49 18	MEMORY Girls 120 52.9 20.8

According to Table XVIII it is quite obvious that the Indian girls tested rank higher in their mean scores of per cent correct then the Indian boys, except in the Time test where the difference favors the boys. The obtained difference of .9 and the true difference of .7 suggests that 76 in 100 chances the real difference is greater than zero.

The differences discovered on this table are not of any "virtual certainty" since none of the $\frac{D}{60}$'s approach 3. any nearer than 1.9. The differences on the Fitch test favoring the girls, and on the Time test favoring the boys are the cost significant. The differences on the Hhythm test and on the Habro test are the least significant.

PABLE XIX

	PINH Boarding Public		LOUDERSS Boarding Public		DETTING Boarding Public	
Sanber	168	98	152	98	162	98
Noan Score	59.4	57	66.3	68.7	70	67
	14.97	15,13	12,86	14.58	13.47	16.95
	1.	35	1.35		1.6	
	TINE Boarding Public		SINB Doarding	ng Public	TOMAL H Rearding	RIONY Pudi ic
Nuaber	162	98	162	98	163	98
Nean Score	65.3	64.3	67.5	60.3	51.9	49.3
S. 3.	18	10.81	14	14.62	15.58	19.44
<u>-2</u>	.49		3.8		1.15	

POLYCIER SCHOOL AND FUELAG SCHOOL

Although the results on Table XIX do not reveal extraordinarily significant differences, nevertheless, a number of interesting comparisons and conjectures can be ventured with these results.

In general, and, almost entirely, the Indian children that have been tested in this jurisdiction come from the same family background. In many cases, children that have been tested at the boarding school had brothers and sisters who had been tested by the same experimenter in the respective public school in the community where they live. Most of the other children tested in the public schools have close kinfolks that had been tested in the boarding school. The family backgrounds are very similar. The needs are the same. The local social, cultural, economic, and health levels are the same. The local Educational Field Agency recently stated that it was the conviction of the agent that the children attending the boarding school were truly fortunate. He felt that they were being taken care of much more adequately in all the major areas of good living than those living at home. Furthermore, he felt that, since all suffered from poor home environment, therefore all constitute reasonable dependency problems. Since the boarding school can accommodate but a limited number of the true dependency cases the others have to make out as best as they can at home. In other words, the boarding school children are not definitely the worst off in areas of proper living; it is more of a matter of fairly equal home environment. If this is a true picture of conditions, one could expect reasonably valid answers to the following questions:

1. Does life away from home, in a boarding school environment, affect test performance, or sharpen musical talents?

2. If any differences occur between the two groups are they a result of either state public school influence operating under the

state curriculum geared to the needs of white society, or federal Indian school influence, whose teachers are federal civil servants, and whose curriculum is geared to Indian needs?

It appears that, in general, the children attending the foderal boarding school are slightly more talented in respect to all but one of the areas tested. It is doubtful whether the instruction in music at the boarding school is much better than that in other schools. However, this is true: the instruction offered in the boarding school offers equal opportunities for all students. Many of these students, were they attending public schools, would not be in the social position to avail themselves of special attention in such instruction. This is not the fault of the school, but possibly more of a native problem of reticence. With no theoretical criticism from so-called superior white children, they can develop musically more easily. The writer feels that the difference in favor of boarding school children, is more, because unhampered opportunity in several areas, such as better food, better shelter, better health facilities and hygiene, and better mental attitude of the children, because of the environment planned entirely for their needs -- plus a certain amount of accelerated maturation that can take place where there is no reserved or actual prejudice practiced. It is true that a certain amount of good maste training (undeliborate, is respect to the test) can, to an extent, affect test scores. This last statement, along with the previously mentioned ideal conditions, can very easily account for the slight difference.

There appears to be no particular justification for the difference in the Loudness test favoring those tested at the public schools.

Since there is a real or significant difference in the results of the Timbre test, a question arises which would be of possible interest to research workers in acoustics: can the recognition of changes in tone quality or tunal timbre be affected by physical and mental environment?

TABLE XX

	PITCH Full One-Fourth		LOUDNESS Full One-Fourth		RH Full	YTHM One-Fourth
Number Mean Score S. D. <u>D</u> 6p	30 26 63 63.8 19.39 11.64 .44		30 26 68.7 67.6 14.9 12.45 .3		30 71.8 11.97 .2	26 71 14.86 19
	TIMS Full One-Fourth			والمرجاب والمعادي فالمنابع فالمتحافظ والمتكون والمتكار والمتكر والمحاد والمحافظ فالمعاد والمحا	And the second states in such that the second states in the second state	and a second
	Tull ^T	IMS One-Fourth	TI Full	MBRE One-Fourth	TONAL Full-	MEMORY One-Fourth

FULL-BLOODS AND LESS THAN ONE-FOURTH BLOODS

There are no significant differences between the results of the thirty full-blood Indians and the twenty-six Indian children of less than one-fourth Indian blood.

The subjects involved in this analysis were deliberately selected. The thirty full-blood Indian children were selected from four tribes which had a preponderance of full-blood Indians. They were the Pawnees, Poncas, Otoes, and Kickapoos. Between seven and eight subjects were selected from each of these tribes. An even grade distribution is also represented in this grade. The writer drew numbers corresponding to the individual subjects in order not to select any subjects irrespective of known special aptitudes. The same care was taken in selecting the twenty-six Indian children who have less than one-fourth Indian blood.

The writer feels keenly that the very small sampling is, indeed, a serious limitation. However, he feels that the results indicate definite noteworthy brends that may be of far-reaching importance.

The fact that this small group of full-bloods and nearly whites differ very slightly from each other, the difference favoring the full-bloods very minutely on three of the six tests, and favoring the nearly whites on the remaining three tests indicates almost a toss-up in the distribution of talents.

In all likelihood, Seashere did not build his norms around subjects from the lower stratum of society. This lower social or economic group was most likely part of the lower extremity of the probability curve. The results of Table XX seem to indicate that the differences discovered between the Indian children and the norms may not be as much a racial problem as an environmental problem. It could almost appear that this group of Indian children could find their counterparts somewhat below the heavy clustering of scores of a probability curve set up by the Seashore norms among an

equal-sized group of white children.

It had been pointed out that the type of environment from which these Indian children spring and in which they live part of the time, and from which the ninety-eight tested at public schools live from one end of the year to the other, is not conducive to accepted good physical, mental, or moral growth. The children have been found retarded in many areas, not because they are Indian, but because of the type of environment from which they come. Regardless of the nature or nurture theory adhered to by Seashore and his collaborators in regard to musical talent testing (that these are raw, native talents, and as such are not easily subject to improvement through age, growth, or specific practice, except to a limited extent), the writer feels that there is an indication in Tables XIX and XX that if the Indian children tested had possessed that same average American social, economic, moral, aesthetic, and health background as those children tested by Seashore, the results would possibly have been much more favorable.

There are indications, then, that the Indian test results would be more nearly like the results shown in the norms if for each case tested by Seashore in his setting of norms, one would select an Indian child of same environment (in every respect). To work out such a problem accurately, it would be necessary to take into account the complete background of each and make certain that the pairing of an Indian child for each white child would be perfect in almost every conceivable respect. This is a problem the working out of which would be very costly and time-consuming. But such a study would for all times establish whether or not there is a racial difference in musical talent. However, it is problematical whether or not one should be

interested in such an Indian problem. After all, the major share of Indian population is the type tested in this study. A further study would be of interest, after the Indian has taken his place in white society on a proportionately equal plane. This study takes the Indian as he actually is in his habitat. It establishes a basis from which to work. It establishes how talented these particular Indian children are now, regardless of possible outcomes under future ideal or controlled conditions.

TABLE XXI

and a second	a a sua da a sua da a sua da a sua de a		an a	
TEST	NUMBER TESTED	HEAN SCORE OF & CORRECT	S. D.	
Fitch	·· 72	70.4	8.5	
Loudnese	22	76.9	6.7	
Raythm	22	78.2	8.4	
Time	22	75	6.4	
Timbre	22	74.5	7.28	
Tonal Memory	22	67.3	14.7	

SPECIAL MUSIC STUDENTS

The word "special" on Table XXI might suggest music students of cutstanding ability. This is not the case. These twenty-two students are Indian children who have taken music opportunities more seriously than others, and have grasped opportunities offered to all. Their performance is not better than many of the others but the attitude was quite a bit more whole-hearted. In other words, they had as little to start out with as the others but made more of their musical experiences. Twenty-two is a small group, but it is near the same per cent of any unselected group of students who carry out the music work of a school more successfully than others. They rank quite near the norm set up for seventh and eighth grade students, in a few items above the norm, and in a few items slightly below the norm. These are not especially the students who ranked highest on the Seashore Measures, but these who can be depended upon to put over a musical program.

CHAPTER V

SUMMARY OF RESULTS AND CONCLUSIONS

The results fron this study as analyzed in Chapter IV may be summarized as follows:

The Indian children in the three grade groups rate considerably lower than the children in the norms set up by Seashore in the Revision of the Measures of Musical Talents.

The results of the Pitch test show that there is a real difference in favor of the norms in each grade group. There is, however, a strong indication that this difference decreases considerably from grade to grade.

A comparison of the results on the Loudness test indicates that a real difference exists in favor of the norms. This difference decreases from grade to grade.

There also is a real difference between the Indian children tested and the norms in respect to the Rhythm test. There is a slight decrease in difference from grade to grade.

The results of the Time test also indicated a real difference between the Indian children tested and the norms.

The results of the Timbre test show that although there are differences on other tests, here there is a real difference in each of the Indian groups tested when compared with the norms.

The results of the Tonal Memory test show that a real difference exists between the norms and the Indian children.

The differences between the Pawnees, Poncas, and Otoes on each of the six musical talent tests are very insignificant. Of the three tribal groups the Pawnees had the highest mean score and the Otoes had the lowest mean score on the Pitch test.

The Poncas had the highest mean score on the Loudness test and the Pawnees had the lowest mean score.

The Poncas also had the highest mean score on the Rhythm test and the Pawnees had the lowest mean score.

The Poncas had the highest mean score on the Time test and the Otoes had the lowest mean score.

The Pawnees had the highest mean score on the Timbre test and the Otoes had the lowest mean score.

The differences of the three tribes on the Tonal Memory test indicate that the Pawnees had the highest mean score and the Otoes had the lowest. In this case the differences are so alight that they can be disregarded.

The Indian girls had a higher mean score on all tests except the Time test. However, these differences are so insignificant that they cannot be counted as real.

The Indian children attending the boarding school had a higher mean score on all but the Loudness test than those attending public school. The difference between the public school and boarding school groups are not significant, but they indicate the possibility of environmental influences.

There is no significant difference between the full-blood children and those who were almost completely white. The full-bloods had a slightly higher mean score on the Loudness, Rhythm, and Timbre tests, and the children who were almost white had a slightly higher mean score on the Pitch, Time, and Tonal Memory tests. The special music students tested ranked near the norm set up for the seventh and eighth grade children.

Before drawing conclusions from these results it appears necessary to evaluate the results to an extent that the reader will not regard them as generalizations concerning all Indians.

The results clearly show in what respect and to what extent these particular Indian children differ from the norms. There are indications, however, that the results would be different if a continuous and different environment prevailed. These indications are taken from the observations that the full-bloods rate as high as those Indian children who have but a negligible per cent of Indian blood, and that the boarding school Indian children under better social and physical environments rate somewhat higher than those Indian children living throughout the year on the reservation and attending the nearest public school. Also, it was observed from the results of three of the tests that the differences between the Indian children and the norms decreased as they advanced in grade level.

These statements do not intend to contradict any general statements made by authorities concerning the test battery used, especially one by Seashore:

"They do not measure training or achievement in music. Excellence in these is a condition for artistic appreciation and skills in performance; but it does not itself guarantee such achievements. They do not measure intelligence, feeling, or the will to work. They do not furnish a single all-inclusive index to musical ability. They should not be averaged; each score is but an item in the musical profile. They are not fool-proof. As measuring instruments they are fully adequate, but the use of them requires tact, skill, ability to motivate, favorable atmosphere, and wisdom in interpretation. "The conclusion to be drawn must be limited specifically to the implication of the factor which has been measured under control. Thus if we measure the sense of rhythm and find a very superior performance, the conclusion is not that the subject is musical; it is merely that the individual has a very superior sense of rhythm."¹⁰

In these two statements are contained as good a critical evaluation of the test battery used as any. The writer has found a few cases who rated high on the musical talent tests, but rated very low in performance and "will to work." However, music students who had an apparent will to work rated high also.

CONCLUSIONS

The writer feels safe in conclusing that the test battery used indicates quite well the relative position of the subjects tested in the six areas of musical talents in respect to the norms that have been set up.

With no apologies or excuses the Indian children tested are inferior to the norms in the six areas tested.

The Indian children are more talented in Rhythmic sense than in the other five areas.

These same Indian children are least talented in Tonal Memory and in Sense of Pitch.

The special music students performed better on the tests than the seventh and eighth graders in the norms and are therefore more talented in these respects despite their social handicaps.

10 Seashore, Carl E., Don Lewis, and Joseph Sacturit, <u>Manual of</u> <u>Interpretations and Instructions</u>, (Canden, New Jersey: RCA Manufacturing Co., 1939) p. 4. There is an indicated trend showing that Indian children under equal "long-term" conditions can perform at least as well on these tests as the children used in the norms.

This last statement opens possibilities for much useful research. It is a possibility that needs to be explored.

These conclusions are not definite to the end that they intend to stignatize the Indians, placing them in an inferior category. The conclusions reached are based on figures and the effect certainly is mellowed when the reader acquaints himself with the handicaps under which many Indians live even nowadays, who have not been able aptly to adjust themselves to a fast moving and rather selfish society. The writer feels that the Indians suffer under certain repressions which hinder them from distinguishing themselves more.

BIBLIOGRAPHY

- Beckham, Albert Sidney. "A Study of Social Background and Musical Ability of Superior Negro Children." Journal of Applied Psychology, XXVI, (April, 1942), 210-217.
- Bienstock, Sylvia. "A Review of Recent Studies of Musical Aptitudes." Journal of Educational Psychology, XXXIII, (May, 1942), 427-442.
- Drake, Raleigh. "Four New Tests of Musical Talent." Journal of Applied Psychology, XVII, (October, 1933), 196-207.
- Drake, Raleigh. "How Much Music Has My Child?" Etude Music Magazine, (March, 1940).
- Drake, Raleigh. "Validity and Reliability of Tests of Musical Talent." Journal of Applied Psychology, XVII (1933), 447-458.
- Eels, W. C. "Mechanical, Physical and Musical Abilities of the Native Races of Alaska." <u>Journal of Applied Psychology</u>, XVII, (October, 1933), 493-504.
- Farnsworth, P. "Are Music Tests More Important Than Intelligence Tests in Prediction of Several Kinds of Music Grades." Journal of Applied Psychology, XIX, (June, 1935), 347-350.
- Fay, R., and Middleton, W. "Relationship Between Musical Talent and Preference for Different Types of Music." <u>Journal of Educational</u> <u>Psychology</u>, XXXII, (November, 1941), 573-583.
- Friend, Ruby. "Influences of Heredity and Musical Environment on the Scores of Children in Kindergarten on the Seashore Measures of Musical Talent." Journal of Applied Psychology, XXIII, (June, 1939), 347-357.
- Garrett, Henry E. <u>Statistics in Psychology and Education</u>. London, New York, Toronto: Longmans, Green and Co., 1937.
- Gilbert, G. M. "Aptitude and Training: A Suggested Restandardization of the K-D Test Norms." <u>Journal of Applied Psychology</u>, XXV, (May, 1941), 326-330.
- Gilkinson, H. "The Seashore Measures of Musical Talent and Speech Skill." Journal of Applied Psychology, XXVII, (October, 1943), 636-637.
- Hattwick, Melvin, and Harold Williams. <u>The Measurement of Musical</u> <u>Development</u>, University of Iowa Studies in Child Welfare. Iowa City: University of Iowa Press.
- Lewis, Don. "The Timbre Test in the Revised Seashore Measures." Journal of Applied Psychology, XXV, (February, 1941), 108-112.

- Manzer, C., and Marowitz, S. "Performance of a Group of College Students on the K-D Tests." <u>Journal of Applied Psychology</u>, XIX, (June, 1935), 331-336.
- McGinnis, Esther. "Seashore Measure of Musical Talent Applied to Children of Preschool Age." <u>American Journal of Psychology</u>, XL, (1928).
- Morgan, Russel V. "Music in School Instruction." <u>Review of Educational</u> <u>Research</u>, XII (April, 1942), 201-202.
- Mursell, James. The Psychology of Music. New York: Wa. Norton and Co., 1937.
- Owens, Wm. "Exceptional Musicality in a Low Grade Imbecile." Journal of Educational Psychology, XXXII, (October, 1941).
- Saetveit, Joseph G., Don Lewis, and Carl E. Seashore, <u>Revision of the</u> <u>Seashore Measures of Musical Talent</u>. University of Iowa Studies, Series on Aims and Progress of Research, No. 65. Iowa City: University of Iowa Press (1940).
- Salomon, Julian Harris. <u>The Book of Indian Crafts and Indian Lore</u>. New York: Harpers.
- Schoen, Max. The Psychology of Music. New York: Ronold Press Co., 1940.
- Seashore, Carl E., Don Lewis, and Joseph Saetveit. <u>Manual of Interpre-</u> <u>tations and Instructions</u>. Educational Department, RCA Manufacturing Co., Inc. Camden, New Jersey, 1939.
- Seashore, Carl. The Psychology of Musical Talent. Boston, New York: Silver Burdett Co., 1919.
- Taylor, Elizabeth. "A Study of the Prognosis of Musical Talent." Journal of Experimental Psychology, X, (September, 1941), 1-28.
- Williams, Harold M., and Clement Siever, and Melvin S. Hattwick. <u>The Measurement of Musical Development</u>. University of Iowa Studies in Child Welfare, No. 1. Iowa City: University of Iowa Press, VII, (1932).

.

Typist: Mildred Practt