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Analysis of citizenship trait ratings of music students and non-music students in one Nebraska high school

Thomas Spencer Brown

The University of Montana

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AN ANALYSIS OF CITIZENSHIP TRAIT RATINGS OF MUSIC STUDENTS
AND NON-MUSIC STUDENTS IN ONE NEBRASKA HIGH SCHOOL

by

THOMAS S. BROWN

B. of M.E. University of Colorado, 1953

Presented in partial fulfillment of the requirements for the degree of

Master of Music

MONTANA STATE UNIVERSITY

1960

Approved by:

[Signatures]

Chairman, Board of Examiners

Dean, Graduate School

AUG 1 8 1960

Date
ACKNOWLEDGMENTS

The writer wishes to acknowledge his indebtedness to professors Gerald Doty, Forrest Brissey, and H. E. Reinhardt for their counsel and their interest in this project. Also of great help were Andrew Foley of Battle Mountain Disabled Veterans Hospital, Hot Springs, South Dakota, and the administration of North Platte Senior High School, North Platte, Nebraska.
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PREFACE

In the fall of 1957 Soviet Russia announced an achievement that occasioned the surprise and respect of the nations of the Western World. Americans realized, as its orbit brought Sputnik I over their land, that an urgent reappraisal of United States educational philosophy and practice would be necessary if this nation were to meet Soviet technological advancement. This reappraisal has taken many forms, from heated denunciation to sober reflection and analysis, but in all cases, it subjects the educational systems of our country to a scrutiny never seen before.

In the face of such examination, our schools will certainly effect some major changes. Some revisions have occurred at the date of this writing; others will surely follow. Established courses are disappearing from the curriculum, new subjects are being offered, and other subjects are receiving new stress. A field which cannot be justified as to its contributions to modern education may be subject to de-emphasis, or complete omission from the public school curriculum. The following research is an outgrowth of various claims offered in support of one subject field in the public schools.

Thomas S. Brown
CHAPTER I

INTRODUCTION TO THE STUDY

"Much discussion and debate has taken place on an exact definition, if one is possible, of general education, and music's place in it."¹ So states John Molnar in an article summarizing how music education has reflected the various movements undergone by American general education. During the utilitarian period, in which it began, music education justified itself in the terms of that period, Mr. Molnar points out. As the testing and survey movement became popular, music education, beginning with Carl Seashore's measurements for musical capacity, kept pace with the trend. During the present child centered emphasis of American education, music education stresses the importance of music as part of the life of every child, rather than a subject restricted to a few who must reach a high degree of technical skill. A meeting of the Council of Past Presidents of the Music Educators National Conference in 1940, formulated a declaration of purpose concerning the present objectives of music education. This declaration stressed the importance of music as an exponent of democratic processes, and as an agent of international cultural relationships.² Thus it is that music educators regard their field as an


essential factor in the intellectual and social development of each child.

I. LOGICAL JUSTIFICATIONS FOR MUSIC EDUCATION

The Position of Music Education Authorities

Various approaches are used by leaders in the field of music education to justify the place of music in the public school curriculum. Their arguments range from sweeping statements as to the benefits of music education to logical analyses that explain why music education is necessary to the development of the child. An article by the music director of the San Francisco Public Schools so accurately expressed the value of public school music, that portions of the article were reprinted in a Music Educators National Conference source book. A portion of the article is as follows:

Few school subjects prepare so well for constructive use of leisure time as does music. Music can ameliorate the harshness of life and minister to the depressed and insecure. It can enrich the personality and increase individual happiness. It can contribute to personal fulfillment and self-realization. It can train for accuracy and integrity.

This theme is expanded by Gertrude Stein in an article appearing in The Bulletin of the National Association of Secondary School Principals titled "The Function of Music Education in the Secondary-School


Ctirrelcoloffio^^ She stresses music's value as a leisure time activity, as well as its contribution to mental discipline. In a reprint of this article, the Music Educators National Conference has added the following claims in support of public school music:

Music education offers activities which develop the social aspects of life. Group activities in music offer effective ways of developing cooperation, discipline, personal initiative, individual responsibility, and human relations.

Music education contributes to the health of the students and to the mental and emotional health which is known to respond to the stimulus of music. It exerts a refining influence on the emotions.

Music education develops good work habits. It demands and encourages discipline, and develops wholesome ideals of conduct. It develops proper respect for the rights of others; it emphasizes human relations and collaboration, providing rich and significant experiences in which many share.

One of America's leading authorities on evaluation in music education, James L. Mursell, describes in detail the contribution to the child's personality and character made by music education. In his book, Human Values in Music Education, Dr. Mursell devotes a chapter to the social opportunities afforded by the study of music. In addition to the more obvious social contacts brought about by public school music, he points out that making music is really creating for others, and as such, is one of the most valuable types of social contacts. In another chapter,


6Morgan, op. cit., pp. 10-11.

titled "Music as a Moral Force," Mursell shows how music adds to inner personal happiness and opens the way toward new patterns of conduct. No claims of a magical force inherent in music are made; each statement is backed by logical arguments and related experiences.

Specific Claims of Music Education's Contribution to Citizenship

During the course of any review of authoritative expression in which music education is evaluated, the investigator will certainly find many references to music education's contribution to citizenship. An example of this is found in the second music education source book, Music in American Education.

Music education always has had an important place in the curriculum of democracies. Over two thousand years ago music was a part of the education of every Greek citizen. ... So today it does not seem too much of a boast to say that one of the most important contributions music education makes in our curriculum is one of education for citizenship [italics in the original].

The author goes on to point out in general terms, how music education makes this contribution to citizenship. He breaks the term "citizenship" into several parts: self-assurance, self-realization, personal security, responsibility, individual initiative and group co-operation. After treating each of these characteristics separately, he sums up his statements in this manner:

At the risk of under-emphasizing many of the other important functions of music in the curriculum at all levels of education

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8 Ibid., pp. 135-61.

today, I believe I would put education for citizenship as its most important function. . . . This is music's most important stake in education [italics in the original].

Other authorities are more explicit concerning music's contribution to citizenship. Martha Pearman tells how she works to improve certain characteristics of citizenship in the members of her junior high and high school vocal groups. Social acceptance of introverted personalities, she says, is aided by audience applause, and the sense of belonging to a group. Group, or team spirit, develops responsibility, which in turn, fosters co-operation with the teacher. Initiative and responsibility are served by the acceptance of students' ideas and suggestions, Pearman continues. Many of these statements were corroborated in a previously cited article by Gertrude Stein.

Need for Research in the Area of Music Education Evaluation

"We need music educators who can tell us not only what is good music but what music is good for." Such a statement by an education official outside the field of music illustrates the need for concrete, penetrating research to determine just what it is that music accomplishes for those who study it in the public schools. The ringing statements made by so many who fervently believe in the worth of this subject field, need backing of a type that does not depend upon a prejudicial attitude for its support. As Mursell states: "We must examine every particular of our

10 Ibid., p. 3.


12 Stein, loc. cit.

13 Morgan, op. cit., p. 2.
undertaking. . . . We must show the significance of our work.\textsuperscript{14}

The Music Educators National Conference recognizes the need for research in evaluation and justification of music education to the extent that it sponsors studies of its own along these lines. Listed as one of the purposes of the ten commissions on music education operated by the MENC, is the following: \textsuperscript{15} (1) To provide appraisal, evaluation and study in broad areas which are of continuing, substantial and enduring concern to the music education profession. Such statements by those vitally concerned with music education lead one to believe that although considerable research has been completed in this area, much more is still needed to give music a sound basis for justification in modern education.

II. THE PROBLEM

Statement of Purpose

If such statements as have been brought out on the preceding pages regarding the desirable effects upon citizenship to be gained by the study of music are indeed true, it should be possible to design studies to demonstrate this fact. The present research had as its objective the attempt to discover whether or not the study of music in one public high school was accompanied by significant changes in the grades given in citizenship to the students of that high school.

The general characteristic "citizenship" was broken down into seven different traits. Most of these traits have already been mentioned

\textsuperscript{14}Mursell, op. cit., p. 4.

\textsuperscript{15}Morgan, op. cit., p. 329.
by the authorities previously quoted, as directly pertaining to citizenship. A control group was used in an effort to determine the possibility of a difference between the citizenship grades of those students who studied music and those who did not study music throughout their three years in high school.

Definitions of Terms

Many definitions have been given later in the study in order to keep them within the context in which the terms have been used. Several operational definitions must be given at this time to facilitate explanation of the problem.

Citizenship. The combined effect of certain traits of character that are responsible for the worth of an individual in a particular society was termed "citizenship." In the case of this study, the society involved was a group of high school students. Thus, the student's citizenship would be his conformity to the ideals of one American high school.

Citizenship traits. Those human qualities of character, the total of which constitute "citizenship," were called "citizenship traits." These qualities were as follows: 1) Co-operation, 2) Emotional Stability, 3) Industry, 4) Initiative, 5) Appearance, 6) Responsibility, 7) Social Acceptance. The term "citizenship traits" was adopted from the high school from which data for this study was taken, and which gave grades in each of these traits called "citizenship grades."

Students. The term "students" as used herein refers to high school students, and is often limited to the students of the high school from which the data were taken. The term "pupils", often preferred when referring to high school students, was not used as it is a more limited term,
usually describing those whose study is in only one field, or who are being tutored by only one teacher.

**Non-music students.** That group of sample members which did not participate in any musical activity, either in school or privately, throughout the three years of senior high school were termed "Non-Music Students."**

**Music students.** That group of sample members which participated in a school-sponsored musical activity continuously throughout the three years of senior high school were termed "Music Students." Private lessons might, or might not have been taken by members of this group.

In some instances, definitions and explanations have been given of statistical processes in order to show their applications to the study when they might not be readily apparent to some readers."16

**Delimitations**

Scope of research design. Despite the large background of research in the field, this was essentially a pilot study in many respects. Many variables were uncontrolled. Samples were unselected in regard to: heredity, financial status, social status, or type of musical activity. These uncontrolled variables, and their possible effects, are discussed in Chapter III.

This study was designed to detect the possibility of music study having an effect upon citizenship traits. Regardless of the outcome of

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the analysis of data, no cause and effect relationship could be estab-
lished. The types of analyses utilized in this work tend to place the
samples in certain groups, that is, groups which did improve, or did not
improve. No linear correlation of continuous variables was attempted
and no comparison of the amount of music studied and the amount of improve-
ment in citizenship was made. It is impossible to determine from this
research whether music is a causal factor, or a likely characteristic
accompanying a certain citizenship rating. Such possibilities have been
dealt with in greater detail in Chapter III.

Limitations of the experimental situation. Many limitations
were imposed upon this investigation by the situation chosen for the
collection of data. The school from which the data were collected was
not so large as to make possible separate comparisons on the basis of sex.
Instead, the groups which were compared contained the same ratio of boys
to girls.

The size of the school was also responsible for the fact that the
number of acceptable samples was too small to permit a selection to be
made on the basis of the type of music activity. Thus, samples were taken
indiscriminately from band, chorus and string orchestra class rolls.

The high school utilized in this study was part of a 6-3-3 plan,
the junior high including grades seven, eight and nine, and the senior
high school grades ten, eleven and twelve. Therefore, if any effect was
produced by the study of music, its working interval was only three years
rather than four, as may be the case in many other high schools.

No attempt was made to control scholarship, intelligence, physical
characteristics, or nationalities of samples. Of the other limitations
which occur as a result of uncontrolled variables, many have been mentioned
in context during the course of the project. Since only one school was
used, this study represents, in the strictest sense, only that school, and
only that locality.

III. BACKGROUND OF THE PROBLEM

Review of Research Concerning Mental and Personality Characteristics

Various approaches have been used to study in what way or amount
music study, ability, or interest is connected with other facets of per­
sonality and character. Some studies are rough comparisons, based upon
a few empirical observations; others are highly detailed and carefully
controlled investigations involving large numbers of samples and appro­
priate statistical analyses. Several of the latter type have been accom­
plished under the auspices of the Music Educators National Conference.17

Interests and personalities. At Ball State Teachers College,
Carrol Copeland made a comparison of the results of Kuder Preference Tests
given to a group of high school music students and a group of high school
non-music students.18 While the results were not compared for any statis­
tical significance, it seemed apparent that music students were more inter­
ested in music and related arts. Otherwise, little difference between the
groups was noted.

17 The Journal of Research in Music Education is an important pub­
ication of the Music Educators National Conference, in which significant
research in music education is critically reviewed.

18 Carrol H. Copeland, "A Comparison of Aptitudes, Interests, and
Personalities of Musical and Non-musical Students" (Unpublished Master's
thesis, Ball State Teachers College, Muncie, Indiana, 1924).
In a survey by another investigator, the attitudes and activities of a large number of urban and rural high school students, both music and non-music, were examined by the questionnaire method.\textsuperscript{19} Family backgrounds of the students were controlled to eliminate that variable in both rural and urban populations. While significant differences were not statistically determined, it was the opinion of the researcher that there was little difference between the music students and the non-music students in their attitude toward music and types of music. These findings would seem to contradict those of Copeland in the first study mentioned.

Another researcher attempted to discover reasons for non-participation in music programs in the high school.\textsuperscript{20} This inspection of attitudes has some relationship to the present study in that he found a difference in attitude towards high school music programs, and music in general to exist in non-music students. Among the non-music students, he found that seventy-five per cent of them had at one time taken private music lessons. Since no control group of music students was used in the investigation, the results, although interesting, were inconclusive.

An experiment utilizing two rooms of sixth-grade children examined the possibility that certain music teaching techniques and programs might affect the children's grade in the California Test of Personality. The


test is divided into two areas, Self Adjustment and Social Adjustment, which in turn are divided into several more specific components. Certain teaching techniques were worked out to see if they would have any effect on these adjustment areas in the five months which elapsed between the test and the retest. The two groups were never compared directly, but there seemed little evidence that the special music teaching techniques applied to one group had any noticeable effect in advancing the scores in the test.21

Aptitudes, intelligence quotients, and personalities. Many studies have been undertaken, both in the United States and Europe, in which intelligence, certain aptitudes, and music have been compared. One very significant study in this area was done in 1952 by John Coaley.22 In this work, 180 undergraduate college music students were rated as to musicality by the music faculty. These and a control group of non-music students were given a Bernreuter Personality Inventory and an American Council Reading and Comprehension and Psychological Examination. The music group was also given a Seashore Measure of Musical Talent test. Coaley found that no statistically significant correlation existed between musicality, or functional musical abilities, and personality traits. Of more importance to the present study, he discovered significant differences between the personality profiles of the music students


22 John Christopher Coaley, "A Study of the Relationship Between Certain Mental and Personality Traits and Ratings of Musical Abilities" (Unpublished Doctoral dissertation abstract, University of Michigan, 1952.)
and the non-music students in the scores of Neuroticism, Introvertism, Confidence and Sociability. As has been discovered in other studies, there was a significant correlation of reading ability, intelligence, musicality and Seashore test scores.

The Coaley study was particularly interesting for several reasons. It made use of scientific methods of evaluation and research design throughout, the level of confidence being set at one per cent. Musicality was considered in a linear correlation with results of the other tests. For at least one set of scores, human judges were used to provide ratings, rather than questionnaires, or tests.

Curious disagreements occur between many investigations of musicality and intelligence. While Coaley found significant correlations in his study, many other American researchers have found none. Mursell reports that such differences may be regional, and due to the design of the studies. American investigators, he says, tend to base their findings on the results of standardized tests. European studies, however, have utilized ratings by competent judges, and their results generally show correlations between music and intelligence.

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24Principally, the Seashore Measures of Musical Talent, and the Kwalwasser-Dykema Music Tests for evaluation of Musical ability. The Stanford Binet Scale, the Terman Group Test of Intelligence, the Otis Group Intelligence Scale, and the National Intelligence Test were used in the determination of intelligence.

25Mursell, loc. cit.
IV. ORGANIZATION OF TEXT

Presentation of Evidence in Chapter II

A detailed description of the data which was used in this study, the method of collection, and the various techniques utilized in the analysis of the data have been given in the first section of Chapter II. The variables which were controlled, and several which were not, are mentioned. Frequency distributions have been plotted to aid the reader in orienting to the study. Each chi-square test is described separately, and the results given. Sample calculations and actual chi-square values have been placed in the Appendix.

Results of Study and Possible Conclusions

The evidence and its results are first summarized in Chapter III. The results are then divided into positive and negative findings. An interpretation of these results follows with reference to similar findings by other investigators in the field. Possible effects of the variables which were not controlled are then brought out.

Toward the end of the chapter appear summaries of the conclusions and the extent to which they agree with current beliefs. The study closes with possibilities for further investigation in this area which have occurred to the writer during the course of the work.
CHAPTER II

RESEARCH PROCEDURES

Details of the actual collection of evidence and the examination and analysis to which the evidence was subjected has been described in this section. This part of the paper is necessarily detailed, to cover any questions which might arise concerning the design of the study and its implementation. To prevent confusion, summaries in Chapter III give a brief outline of that which has been presented in greater particular in the following section.

I. COLLECTION OF DATA

Experimental Situation

Size of school and community. The public school from which the data were taken was the North Platte Senior High School in North Platte, Nebraska. This three year high school had a total enrollment of 634 in 1958, the year in which the data was recorded. From 1954 through 1958, the senior classes averaged 194 graduates each commencement.

During the years with which this study is involved, North Platte, Nebraska, had a population of approximately 26,000.

Pertinent characteristics of community. The population of North Platte is quite stable, the major industries being a large railroad installation and agriculture. The population is almost entirely Caucasian with a very few citizens of Mexican and Japanese descent.
Music program and staff. A stable, educationally effective faculty was necessary for reliability in this investigation. The music staff of North Platte Senior High School was generally considered by other music directors to be one of the best in the State of Nebraska. It was administered by three men, an instrumental director, an orchestra man who also assisted the band man, and a vocal director. Each member of the staff had been in his present position six years or longer at the time the data were recorded.

Credit toward high school graduation was given for participation in Band, Orchestra, or Chorus. The band had rehearsals three times a week, plus sectional practices and individual practice periods. The two choirs, junior and senior, practiced two and three times a week respectively, and the string orchestra, three times a week.

Form of data in school files. Each student had a record card for each year of attendance in high school. On page seventeen, a photostatic copy of a sample record has been placed. The card contains a record of the student's attendance, the subjects taken during the year and the grades received in them, and a section known as "citizenship grades."

These citizenship grades are given by each teacher, once each semester, in each of seven traits, or characteristics. The traits are:

1. Co-operation, 2. Emotional Stability, 3. Industry, 4. Initiative, 5. Personal Appearance, 6. Responsibility, 7. Social Acceptance. The student is given a grade, A, B, C, D, or F, in each of these traits. Thus, the average student taking four subjects would have at the year's end, eight grades in each trait, two from each teacher in each of four subjects.
# Current Record Card—North Platte High School

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<td>Sept. 1957</td>
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<th>Live with Parents?</th>
<th>If Not Where?</th>
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<td>Marks</td>
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<td>RS</td>
<td>C</td>
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| **Gen. Science** | **Gen. Science** |
| Tchr. | Marks | Tchr. | Marks |
| WM | D | WM | B |

| **English I** | **English I** |
| Tchr. | Marks | Tchr. | Marks |
| C | C | C | C |

| **Spanish I** | **Spanish I** |
| Tchr. | Marks | Tchr. | Marks |
| SS | D | SS | C |

| Band |  |
| Tchr. | Marks |
| VR | 5 |

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**FIGURE 1**

Photostatic copy of a sample North Platte High School record card, partially completed.
If five subjects were carried, as was the case with a number of samples, ten grades would be recorded in each citizenship trait.

**Integrity of ratings.** According to the principal of the high school, teachers were instructed to give very serious attention to the citizenship grades. This was necessary because of the stress placed upon them by local hiring authorities, who paid much more heed to these ratings than to grades in regular course work. The writer was assured by Mr. Horesji, the principal, and by several teachers who also were interviewed, that the citizenship grades represented the best judgments possible by the teachers giving them.

**Selection of Samples**

Two groups of fifty samples each were chosen on the basis of whether or not they had taken music in high school. To locate students who had taken music, the high school annuals were used and names selected from music organization pictures; these students' records were then located in the files.

**Number of samples.** The number of samples chosen for each group was dependent upon the number available in the record files. The size of the school and the number of students involved in the music program made a relatively small number necessary. One authority, in a discussion of sample size, makes the following statement: "... as an arbitrary figure, we may say that \( n \) should be at least fifty, however few the number of cells." The statement occurs during the course of an enumeration of common
sources of error in research studies.¹ In order to draw the samples from as large a population as possible, class records were used as far back as 1954, the year in which the citizenship grading system was first used.

Controlled variables and sampling interval. The number of records available for selection of non-music samples was something over one thousand. A sampling interval of twenty was therefore chosen.² If a sample had to be rejected because some music had been taken in high school, or because less than four subjects were taken in the tenth or twelfth years, the next card in the file was selected in its place.

Among the members of the bands, choruses and orchestras, every twenty-fifth name was chosen. Each music student had to have taken a music activity every year in high school, and four or more solid subjects in the tenth and twelfth years.

The music organizations in the school were found to maintain a ratio of about two boys to every three girls. This ratio was kept in the selection of samples, so that in each of the two groups of fifty, twenty samples of boys and thirty of girls were chosen.

The variables which were controlled then, were as follows:

1. Whether or not members had taken three straight years of music.
2. Sex of sample: two boys to three girls.

3. Academic load: each student in both groups had to have carried at least the standard four solid subjects in the tenth and twelfth years.

4. High school attended: each student must have completed all three years at North Platte Senior High School.

At the beginning of this study, the range of the citizenship grades was to be controlled by selecting samples with a semi-interquartile range (Quartile Deviation), of no more than 1, the numerical equivalent of one letter grade interval. This procedure would eliminate samples with wide ranges indicating a disagreement among the judges. After a perusal of the record cards, however, this investigator decided that such a device would be unnecessary because of the fact that it would eliminate none of the samples. The judges were generally unanimous in their ratings, or at the most, one or two teachers would vary one grade point from the mode. In any questionable cases, the semi-interquartile range would have been computed if the range appeared great enough to invalidate the sample.

**Manipulation of ratings.** Grades were recorded from the tenth and the twelfth years of each sample by changing them from letter to numerical equivalents. Thus, "A's" were recorded as 4's, "B's" as 3's, "C's" as 2's, "D's" became 1's, and "F's," 0's. In this fashion, the grades for the year were averaged together for each trait being considered. This average, then, was the result of the eight or ten grades given throughout the year by four or five teachers.
II. PRELIMINARY EXAMINATION OF DATA

Orientation to the Analysis Presentation

An examination of the trends which the groups seemed to have may help to prepare the reader for the more precise outcomes of the chi-square tests. After the data had been collected, four groups of fifty averages each existed for each of the seven character traits. They have been classified as follows:

1. Tenth-grade students who have studied music in the tenth grade have been labeled the Tenth-Grade Music Group.

2. The same students described in 1. at the end of their twelfth year, after they have studied music continuously throughout their three years of high school, have been called the Twelfth-Grade Music Group.

3. Tenth grade students who have not studied music in the tenth grade have been referred to as the Tenth-Grade Non-Music Group.

4. The same students described in 3. at the end of their twelfth year, after they did not take any music activity at any time throughout their high school careers, have been termed the Twelfth-Grade Non-Music Group.

In most of the following examinations, the foregoing groups have been studied in pairs, comparing their performance in each trait. One procedure has been devised, however, in which all four groups are considered simultaneously. Another process combines all seven character traits for a total citizenship grade.
Frequency Distribution of Each Trait. In order to facilitate discussion of the performance of the various groups in each trait by providing the reader with a visual concept of their performance, frequency distributions have been drawn. These curves may be found on pages 25 through 38, following a brief description of each distribution.

Co-operation frequency distributions. The Non-Music Groups are bimodal in both tenth and twelfth grades. Their means show the tenth graders slightly lower than a 3, or a "B" average. The twelfth graders have a mean of almost exactly a "B", a numerical gain of .17.

In the Tenth Grade Music Group, bimodality is very pronounced. This gives way to a J-shaped distribution in the twelfth grade. A gain of .22 grade points has been made.

Emotional Stability frequency distribution. The Non-Music Group has a bimodal curve for the tenth grade. This is changed to a negatively skewed distribution with a single mode in the twelfth grade. The means of the two grades indicate almost no improvement.

Extreme leptokurtosis was shown for the Tenth-Grade Music Group becoming bimodal by the twelfth grade. The means showed an improvement of .18.

Industry frequency distribution. The curve for the Tenth-Grade Non-Music Group was one of the two curves plotted that approached normal symmetry. The twelfth grade group was slightly negatively skewed with a very small gain in grade point.

The Music Group inclines toward the J-shape in both distributions.
The tenth graders are bimodal and shift towards a single mode in the twelfth year. A gain of .16 was made in grade points.

**Initiative frequency distribution.** Both Non-Music distributions are leptokurtic and negatively skewed. A slight gain of .06 was made.

The Tenth-Grade Music Group had an irregular curve with three distinct modes. By the twelfth grade, the distribution became more settled, but still showed two modes. The difference of means was .16.

**Personal Appearance frequency distributions.** The Tenth-Grade Non-Music is very irregular with three separate modes. These modes shift, but are still in evidence at the twelfth grade level. Only a very slight gain in grade average was made.

The Tenth-Grade Music Group has the most leptokurtic distribution of any group. This gives way to a fairly even J-shape in the twelfth grade. The means of the two groups showed an improvement of .20.

**Responsibility frequency distribution.** A single modal, rather leptokurtic curve is shown for the Tenth-Grade Non-Music Students. The curve assumes a somewhat more normal shape by the twelfth grade. A gain of .14 is made.

The Music Group shows a change from a leptokurtic distribution to an even J-shape with a mean gain of .31.

**Social Acceptance frequency distribution.** The Non-Music curves are both negatively skewed, with the modes falling around 2, although the means are more than 2.5. Almost no gain is in evidence.

Both Music Group curves bear a great similarity to their
corresponding curves in the Co-operation distributions. Appearance and Responsibility also resemble the Social Acceptance distributions for the Music Groups. A gain of .23 is shown.

Summary of frequency distributions. In a comparison of the various distributions, certain similarities may be found. Non-Music Group distributions show leptokurtosis or bimodality in all traits but one. By the twelfth year only one curve remains bimodal, the others all being leptokurtic. Other than these tendencies, few similarities can be noted which apply to all, or a large portion of the Non-Music curves. The means of the Non-Music Groups improve during the three years of high school an average of .08.

In the tenth grade, the Music Groups are generally extremely leptokurtic and occasionally bimodal. These curves give way in all traits to a definite J-shape in the twelfth grade. Their means improve an average of about .21. Observation of these curves suggest the presence of a transient intermediate group, which begins at a lower grade level, and improves to near an "A" average by the senior year. Two other groups apparently remain stationary, one at an extreme upper level, and one around a 2.5 level.

Normality Tests of Frequency Distributions

The original design of this investigation called for tests of significance of amount of increase between tenth and twelfth grade means. A statistic known as the $t$ ratio, which tests the likelihood that a difference between two means is a real difference and is not due to chance factors, was chosen to determine this significance. To give valid results,
FIGURE 2

CO-OPERATION DISTRIBUTION FOR NON-MUSIC GROUPS
FIGURE 3

CO-OPERATION DISTRIBUTION FOR MUSIC GROUPS

12th Grade Mean

10th Grade Mean

Ratings

1 2 3 4 5 6 7 8 9 10

Frequency
FIGURE 4

EMOTIONAL STABILITY DISTRIBUTION FOR NON-MUSIC GROUPS
EMOTIONAL STABILITY DISTRIBUTIONS FOR MUSIC GROUPS

FIGURE 5

Twelfth Grade Mean

Tenth Grade Mean

Frequency

1

2

3

4

Ratings

(A)

(B)

(C)
FIGURE 6

INDUSTRY DISTRIBUTIONS FOR NON-MUSIC GROUPS
Frequency

Twelfth Grade

Tenth Grade / 4

Ratings

Tenth Mean

Twelfth Mean

FIGURE 7

INDUSTRY DISTRIBUTIONS
FOR MUSIC GROUPS
FIGURE 8
INITIATIVE DISTRIBUTIONS FOR NON-MUSIC GROUPS
FIGURE 9

INITIATIVE DISTRIBUTIONS FOR MUSIC GROUPS
FIGURE 10

PERSONAL APPEARANCE DISTRIBUTIONS
FOR NON-MUSIC GROUPS
FIGURE 11

PERSONAL APPEARANCE DISTRIBUTIONS FOR MUSIC GROUPS
RESPONSIBILITY DISTRIBUTION FOR NON-MUSIC GROUPS

FIGURE 12

Ratings

Frequency

1
2
3
4
5
6
7

Tenth Mean

Twelfth Mean

Tenth Grade

Twelfth Grade

(A)  (B)  (C)
Figure 13

RESPONSIBILITY DISTRIBUTION FOR MUSIC GROUPS

Twelfth Grade

Tenth Grade

Tenth Mean

Twelfth Mean

Ratings

Freq.
FIGURE 14
SOCIAL ACCEPTANCE DISTRIBUTION FOR NON-MUSIC GROUPS
however, the $t$ ratio must be used with a normal distribution.\(^3\)

**Departure from normal curve.** The curves that most closely approached a normal distribution were tested for departure from normality. By using a test that compares frequencies in certain areas of a normal curve to corresponding areas in the questionable curve, it was found that seven of the curves approached a normality greater than 80 per cent.\(^4\)

Results of $t$ tests based upon these distributions showed no significant difference of means, so other techniques were used to compare the Music Groups to the Non-Music Groups.

### III. GROUP COMPARISONS BY THE CHI-SQUARE TEST

The tests of significance upon which all inferences have been drawn in this study, are chi-square tests for goodness of fit. This statistical tool compares the number of times something is expected to occur to the number of times it actually does occur. A test of a hypothesis involving frequencies is therefore possible, demonstrating if the disparity between actual and theoretical frequencies is too large to ascribe to chance.\(^5\)

In following procedures, mean ratings for the tenth grade and for the twelfth grade were found by combining both Music and Non-music

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\(^4\)Tests for normality and their results obtained by chi-square are in Appendix B.

groups in each grade and averaging their ratings. Such a "class mean" was found for each trait. The number of samples falling above their class mean was then determined for each of the four groups in each of the seven traits. The following chi-square tests are based upon these frequencies below the class means in an effort to determine if one set of frequencies is significantly more or less than the other set of frequencies.

The level of confidence was set at five per cent.

Comparison of Tenth Graders and Twelfth Graders

Non-Music Students. The chi-square test was applied to the frequencies above the class mean of the Tenth-Grade Non-Music Group and the Twelfth-Grade Non-Music Group. No significant difference even approaching the five per cent level of confidence was found to exist between the two groups in any of the seven traits. Insofar as this test was concerned, no improvement occurred in the citizenship ratings of the Non-Music Group throughout their three years in high school.

Music Students. In a comparison similar to that of the Non-Music Group, the Music Groups also showed no significant increase in frequencies above the class mean from their tenth to their twelfth years. No improvements, therefore, were shown for either Music or Non-Music Groups.

If music or any other factor contributes to the improvement in any of the citizenship traits, the type of analysis just described does not reveal the possibility. As has been explained more fully in Chapter III,

6 For one sample chi-square test, and for the results of all chi-square tests, see Appendix C.
however, only very limited conclusions can be drawn from this evidence.

Comparison of Music and Non-Music Students

As the Music Groups had higher means in all traits than did the Non-Music Groups, the hypothesis that more Music Group samples would fall above the class mean than Non-Music Group samples was tested.

Significance at tenth and twelfth grades. The Tenth-Grade Music Group was found to have a significantly greater frequency above the class mean in all seven traits when compared with the Tenth-Grade Non-Music Group. This significant difference was also found to exist between the two groups at the twelfth grade level. The hypothesis of significant difference was therefore retained.

Comparison of the Combined Citizenship Traits

In order to provide a check on the tests of the individual characteristics, the seven traits were averaged together for each sample, and a combined citizenship grade curve was plotted. After class means for the combined traits in the tenth and twelfth grades had been found, the frequencies above those means for each group were determined.

Chi-square test of combined traits. As was expected, chi-square values of a comparison of the Non-Music Groups in the tenth and twelfth grades showed no significant difference. The same null-hypothesis was also retained for the Music Groups, the differences of which were no greater than could be expected from random sampling fluctuation in eight out of ten samples.
FIGURE 16

COMBINED CITIZENSHIP DISTRIBUTIONS
FOR NON-MUSIC GROUPS
FIGURE 17

COMBINED CITIZENSHIP DISTRIBUTIONS
FOR MUSIC GROUPS
Comparison of Frequencies Above Mean of Class Improvement

Although the amount of improvement in both groups for all traits combined was shown to be insignificant, a determination of what group was responsible for the improvement was made in the following manner.

As shown in Appendix A, the average improvement for both groups combined was 0.147. The average improvement in each trait was found for each group. Then the number of trait improvement means below 0.147 of the Music Group was compared to the number of corresponding means of the Non-Music Group by a chi-square test. The Non-Music Group was found to exceed the class trait improvement mean in only two traits, Co-operation and Responsibility, and the Music Group to exceed this mean in all traits. The chi-square test showed that the Music Group was significantly responsible for the amount of improvement made by the class in all traits combined.
CHAPTER III

INTERPRETATION OF RESULTS

From the evidence presented in Chapter II, certain inferences may be drawn. Some of these inferences taken in combination with results of other studies lead to logical conclusions. Care must be exercised, however, that uncontrolled factors in the studies are taken into account when such conclusions are drawn. Throughout the following discussion, it is very necessary that the reader be aware of the very limited scope of this particular investigation.

I. SUMMARY OF EVIDENCE

To assist the reader in drawing inferences no more extensive than those permitted by the compass of the study, the results of the comparisons given in detail in Chapter II have been summarized at this point.

Sample Groups

Two groups of fifty names each were selected from a senior high school. One group had participated in a school music activity for credit for all three years in high school. The other group had taken no music throughout the three high school years. The tenth year grades and the twelfth year grades of each student in each group were recorded. These grades were ratings given in seven citizenship traits to every student. When all the ratings were recorded, they formed four groups, Tenth and Twelfth-Grade Music Groups and Tenth and Twelfth-Grade Non-Music Groups. 

Comparisons of the Four Groups by Chi-square
Frequency distributions for each group in each trait were plotted. Tests for normality showed seven curves to have normal distributions. The means of all distributions were found and t-tests were applied to these normal distributions to determine the significance of differences between the tenth and the twelfth-grade groups. These tests showed no significant improvement of means at the five per cent level of confidence.

Means were then found for the combined Music and Non-Music groups at the tenth-grade level and at the twelfth-grade level. The frequencies above these means were counted in all four groups in all seven traits. Chi-square was then used to compare these frequencies between groups in the following combinations:

- Tenth-Grade Music Group and the Twelfth-Grade Music Group: Null hypothesis retained.
- Tenth-Grade Music Group and the Tenth-Grade Non-Music Group: Null hypothesis rejected; Music Group significantly higher.
- Twelfth-Grade Music Group and the Twelfth-Grade Non-Music Group: Null hypothesis rejected; Music Group significantly higher.
- Tenth-Grade Music Group: All Traits Combined and the Twelfth-Grade Music Group: All Traits Combined: Null hypothesis retained.
Twelfth-Grade Music Group: Number of Traits Above Improvement Mean.

and the

Twelfth-Grade Non-Music Group: Number of Traits Above Improvement Mean.

Null hypothesis rejected; Music Group significantly higher than Non-Music Group.

Division of Results

When results of the chi-square tests are arranged into positive and negative groups, any implications which these comparisons might have are more clearly evident.

Retention of the null hypothesis. No improvement was found for either the Music Group or the Non-Music Group between the tenth and the twelfth grades.

By the means of examination which was used, the Non-Music Group were shown to improve (or not to improve), at the same rate as the Music Group.

Rejection of the null hypothesis. Significant differences in frequencies above the mean were shown between the Music Group and the Non-Music Group in all traits at the tenth grade level. These differences still existed in the twelfth grade. The Music Group, furthermore, was found to be responsible for the small numerical improvement in citizenship grades that did take place, although that improvement was statistically insignificant.

It should be pointed out that, although each of the seven citizenship traits was tested individually, the results remained the same for each series. If a null hypothesis held for one trait, it held for all.
II. IMPLICATIONS OF CHI-SQUARE RESULTS

Examination of the results of the various chi-square tests reveals a general agreement in certain broad areas. Furthermore, there seems to be little contradiction between the generalities thus implied, and the results of other investigations in these same areas.

Music as a Factor in Citizenship Improvement

As has been pointed out, neither music students nor non-music students made any significant improvement of the type measured in this study from their tenth to their twelfth grades. This does not necessarily mean that no improvement took place in citizenship ratings, it states rather that this study did not demonstrate the possibility that music or any other factor may cause an increase in citizenship ratings. If results had been different, and improvement of the Music Group had been significant, music could not have been named as the causal factor with such limited controls as were imposed in this investigation. By the same token, then, as no improvement was found, it cannot be said from the evidence presented herein, that music is not a causal factor in citizenship improvement.

A strong possibility exists that music is a causal factor in the improvement of citizenship in some students, but not in others. The design of this study could not have tested this theory. Is it not reasonable to suppose, however, that music's influence upon some, but not all, gave rise to the beliefs held by so many music education authorities that music does improve the citizenship of the student?
Agreement with other findings. Although other studies did not investigate precisely the same characteristics as did this study, nor were the designs similar, certain of their implications may be logically compared to the results of this work. Such comparison reveals the possibility of broader conclusions than could be drawn from any one investigation. The following discussion details such possibilities.

Indication of Two Separate Populations

The fact that such a difference apparently exists in all seven citizenship characteristics between the Music and the Non-Music Groups suggests that the samples were drawn from two entirely dissimilar populations of high school students. If such is the case, the findings of other studies may be expected to bear this out, and the differences will go beyond the few traits examined in this study. When these studies are applied to the theory of two different populations, certain other characteristics fall into place, with the result that the division becomes more clearly defined.

Some characteristics of the populations. If John Goaley's study of college students may be applied to similar music and non-music groups in high school, the Music Group may be said to have a greater reading ability, and a higher intelligence quotient than the Non-Music Group. The Music Group may also have greater tendencies toward neuroticism, and exhibit more extraversion and confidence.

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1See pages 12 and 13 of this paper.
Differences in attitudes between those who elected music and those who did not were shown by Copeland and Tharp. Interests and personalities have also been compared by these two and several others. In all cases some differences were found. Perhaps to a lesser degree, Michelelli discovered out-of-school activities and home backgrounds to vary between music and non-music high school students.

**Music possibly characteristic of one population.** Rather than supposing music to be a causation of some of the characteristics of the population which rates higher in citizenship, the inference seems more reasonable that the study of music is just one more characteristic of that group. This study would indicate that, given the name of any student taking music throughout his three years in North Platte Senior High, the chances are very good this student would exhibit any of the other characteristics of the population which studied music.

In a hypothetical case in which a student exhibits the characteristics that may identify the higher rated population, the assumption is logical that this student would demonstrate a preponderance toward the successful participation in music activities. The very human qualities, which some authorities hold are fostered by music education, are vitally necessary for the successful study of music in the public schools. Thus, the speculation that music education is not responsible for the desirable characteristics of the “upper population,” but is itself another characteristic of that population, is not challenged by any evidence presented

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2Summaries of these and other studies referred to in this section have been given on pages 10 through 13.
in this study.

**Likelihood of an Intermediate Group**

When the samples were drawn, it was found that a large number had to be disqualified because of some music study. Many students, it was learned, joined the junior choir for one year, and dropped out when they were not chosen for senior choir the next year. Many other students dropped instrumental music after one or two years in order to take a fifth "solid" subject in preparation for college. By the terms set forth in the design of the experiment, such music study eliminated the sample, but it left a large section of the population outside the scope of the investigation.

Although it is pure speculation, the possibility should be mentioned that this intermediate group may combine some of the characteristics of the other two possible populations. While these "pure" populations may exhibit the extremes, the middle group may contain modifications of those extremes, and so disguise the lines of division.

**Possible Effects of Some Uncontrolled Variables.**

**Socio-economic status.** The possibility exists that the Non-Music Group actually contained samples that might have been in instrumental music but for the fact that the money for instruments was not available. It should be noted however, that the instrumental department in the school in which the study was made had a very adequate supply of school-owned instruments; these were available to any aspirants who were willing to devote the effort necessary to learn to play in the band. Nevertheless, many music students do succeed in music activities because their parents
have made an investment in an instrument and do not want to see their money wasted. Such a student receives encouragement from home that might not be the case with a child playing an instrument that had cost the family nothing.

**Intelligence of the student.** No selection of students was made that was intended to control the intelligence of the groups. No record was kept of their grades in their high school subjects. A higher intelligence might mean more time in which to participate in a music program without sacrificing grades in other school subjects. Thus a selection of music students might automatically limit the group to those with greater intelligence.

The successful study of music itself may take a certain level of intelligence, and those who succeed in learning to play an instrument or who sing well enough to enjoy choral music might be expected to stay in the group throughout high school.

**Degree of maturity.** Since it has been theorized that three years of music is one characteristic of a whole different population of high school students, the possibility that this population matures at a different rate than that of the Non-Music Group should be mentioned. If the Music Students had a higher level of maturity than the Non-Music Students, higher ratings in all citizenship traits might be expected of the Music Group throughout high school.

**Music study before high school.** As no effort was made to eliminate students which had participated in junior high band or junior high operettas, the Non-Music Group may have been diluted somewhat by pre-high
school music experience. In any case, all samples were required to attend general music classes throughout the seventh and eighth grades. The assumption is made, however, that nearly all who participated in such special junior high music activities, must have joined a high school music group for at least a year. Any such membership would have disqualified them as a Non-Music sample.

**Sex, type of music activity, and sample size.** No comparison of citizenship grades was made according to the sex of the sample members. Such a division, while possibly interesting, would have had no bearing on the original problem which controlled the design of the study.

The type of musical organization of which a Music sample was a member was not controlled. There are reasons to believe an instrumental activity might require, or might teach, more of certain citizenship traits than a vocal activity, which does not require as much home practice.

Sample size is mentioned at this time because of its bearing upon the two factors just discussed, as well as other influences which could have affected the outcome of this study. The fact that boys and girls, bands and choirs, various degrees of intelligence and other such differentiations were not made was due primarily to the sample size. This N of fifty, while probably the minimum that might be effective, could not have been greatly increased in a school the size of the one chosen for the study. In the writer's opinion, however, it would be difficult to find a school so large as to permit a sizable increase of sample number in which the music program was highly effective, and in which music activities were so readily available to all members of the student body.
Summary of Conclusions

The results of this study have strongly suggested the existence of two distinct groups, one of which had taken music for three years in high school and had relatively high ratings in the seven citizenship traits, and one which took no music at all and had relatively low ratings in the seven citizenship traits. This conclusion agrees with the results of other studies, which imply that still other characteristics may differentiate the two groups, such as intelligence, family backgrounds, and personalities.

The conclusion that music study is responsible for improvement in co-operation, emotional stability, industry, initiative, personal appearance, responsibility or social acceptance cannot be supported by any evidence submitted in this study. Two possibilities concerning the Music, or "upper" Group are made clear, however: (1) Either music is one of the characteristics of this group, or, (2) Those who study music have the citizenship characteristics of the "upper" group.

III. RECOMMENDATIONS FOR FURTHER STUDY

Throughout this investigation, many possibilities for further study occurred to the writer. Some were based upon the conclusions reached in this work, while others took different directions of investigation and controlled many more factors.

Studies of the "Upper Group"

The existence of an "upper" group regarding citizenship traits and other personality factors has only been suggested in this study. A valuable investigation of this population might be made in other
circumstances, defining its limits and determining just what function
the study of music has in it. As has been mentioned in "Summary of
Conclusions," is the continuous study of music necessarily a character­
istic of those who get high citizenship ratings, or do high citizenship
ratings define a group, some of whom make up the permanent membership
of the music activities?

Investigations determining the correlation between the degree
which is manifested by a certain trait of personality and the extent of
that person's musicality or musical aptitude offer intriguing possibil­
ities. While considerable work has been completed in this field, much
of it is inconclusive, and the possibilities for research are enormous.

Studies of the same type as this one, using much larger numbers
of subjects and utilizing greater selectivity of sampling and broader
areas of investigation, might be possible if several similar schools
were used in the collection of data. Such investigations might look
into the differences manifested in citizenship traits between instru­
mental and vocal students, boys and girls, and a host of other factors.

Stratified Sampling and More Limited Scope

Investigations of the "lower" group are conspicuously absent,
although there have been many surveys which attempted to determine the
reasons students drop out of music organizations. The effect music
might have upon samples that showed the characteristics of the "lower"
group, once it was precisely defined, would be of interest to all music
educators.

While not significant at the five per cent level set for this
study, the traits of Social Acceptance and Reliability came the closest
to a significant improvement in the Music Group of any of the traits. At a probability level of twenty per cent, both would have been significant, although no such difference was shown in the Non-Music Group. There is a possibility that if the \( N \) were increased sufficiently, and the investigation concentrated on these two traits alone, measuring them in various ways, the Music Group might be shown to improve significantly over the Non-Music Group.

By utilizing a large number of high schools, perhaps the number of samples could be increased and statistical techniques appropriate to larger samples could then be used. Such a project might reveal significances obscured by the limitations of the present study.
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Mursell, James L. "Intelligence and Musicality," Education. LIX (April, 1939), pp. 559-562.


C. UNPUBLISHED MATERIALS


APPENDIXES
## General Data

### Music Students

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<td>34</td>
<td>32</td>
<td>34</td>
<td>39</td>
</tr>
<tr>
<td>Frequency Above Twelfth Grade Class Mean</td>
<td>36</td>
<td>36</td>
<td>35</td>
<td>35</td>
<td>38</td>
<td>37</td>
<td>41</td>
</tr>
</tbody>
</table>

### Non-Music Students

<table>
<thead>
<tr>
<th>Grade</th>
<th>Co-operation</th>
<th>Emotional Stability</th>
<th>Industry</th>
<th>Initiative</th>
<th>Appearance</th>
<th>Responsibility</th>
<th>Social Acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenth Grade Mean</td>
<td>2.768</td>
<td>2.620</td>
<td>4.518</td>
<td>2.372</td>
<td>2.740</td>
<td>2.535</td>
<td>2.581</td>
</tr>
<tr>
<td>Twelfth Grade Mean</td>
<td>2.934</td>
<td>2.676</td>
<td>2.598</td>
<td>2.440</td>
<td>2.800</td>
<td>2.680</td>
<td>2.610</td>
</tr>
<tr>
<td>Difference of Means</td>
<td>0.166</td>
<td>0.056</td>
<td>0.08</td>
<td>0.072</td>
<td>0.060</td>
<td>0.145</td>
<td>0.029</td>
</tr>
<tr>
<td>Frequency Above Tenth Grade Class Mean</td>
<td>19</td>
<td>16</td>
<td>17</td>
<td>14</td>
<td>14</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>Frequency Above Twelfth Grade Class Mean</td>
<td>15</td>
<td>13</td>
<td>15</td>
<td>16</td>
<td>14</td>
<td>13</td>
<td>15</td>
</tr>
</tbody>
</table>

### Tenth-Grade Class Mean

<table>
<thead>
<tr>
<th></th>
<th>Co-operation</th>
<th>Emotional Stability</th>
<th>Industry</th>
<th>Initiative</th>
<th>Appearance</th>
<th>Responsibility</th>
<th>Social Acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenth-Grade Class Mean</td>
<td>2.992</td>
<td>2.842</td>
<td>2.820</td>
<td>2.683</td>
<td>3.007</td>
<td>2.789</td>
<td>2.851</td>
</tr>
<tr>
<td>Twelfth-Grade Class Mean</td>
<td>3.185</td>
<td>2.931</td>
<td>2.945</td>
<td>2.796</td>
<td>3.136</td>
<td>3.018</td>
<td>2.983</td>
</tr>
</tbody>
</table>

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APPENDIX B

NORMALITY TESTS

Example:

<table>
<thead>
<tr>
<th>Tenth Grade Non-Music - Emotional Stability.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>More than 3.16</td>
<td>From 3.16 to 2.78</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Frequencies in five equal areas of the actual distribution.

Chi-square test for goodness of fit of actual frequencies to ideal frequencies in corresponding areas of normal curve.

\[
x^2 = \frac{(10-10)^2}{10} + \frac{(8-10)^2}{10} + \frac{(9-10)^2}{10} + \frac{(13-10)^2}{10} + \frac{(10-10)^2}{10}
\]

1.40

Chi-square at 2 degrees freedom, probability .05 = 5.991.

Chi-square at 2 degrees freedom, probability .10 = 4.605.

Null hypothesis retained at the five per cent level of confidence.

Tenth-Grade Music - Emotional Stability. Chi-square test yielded a value of 1.00. Null hypothesis retained.


APPENDIX C

CHI-SQUARE TESTS OF TENTH AND TWELFTH GRADES

Non-Music Groups

|          | Tenth Grade | Twelfth Grade | Average of  
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19</td>
<td>31</td>
<td>15</td>
</tr>
</tbody>
</table>

Co-operation

\[
x^2 = \frac{(19-17)^2}{17} + \frac{(15-17)^2}{17} + \frac{(31-33)^2}{33} + \frac{(35-33)^2}{33} = .712
\]

<table>
<thead>
<tr>
<th>Level of Confidence:</th>
<th>.10</th>
<th>.05</th>
<th>.01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table of chi-square at 1 degree freedom:</td>
<td>2.706</td>
<td>3.861</td>
<td>6.635</td>
</tr>
</tbody>
</table>

Null hypothesis retained at the five per cent level of confidence.


Initiative. Chi-square test yielded a value of .190. Null hypothesis retained.

Personal Appearance. No improvement between tenth and twelfth years.


Music Groups

Co-operation. Chi-square test yielded a value of .207. Null hypothesis retained.


Personal Appearance. Chi-square test yielded a value of 1.714. Null hypothesis retained.


APPENDIX D

CHI-SQUARE TESTS OF MUSIC AND NON-MUSIC GROUPS

Tenth Grade Students.

<table>
<thead>
<tr>
<th></th>
<th>Above</th>
<th>Below</th>
</tr>
</thead>
<tbody>
<tr>
<td>Music Students</td>
<td>38</td>
<td>12</td>
</tr>
<tr>
<td>Non-Music Students</td>
<td>19</td>
<td>31</td>
</tr>
<tr>
<td>Average</td>
<td>28.5</td>
<td>21.5</td>
</tr>
</tbody>
</table>

\[ x^2 = \frac{(38-28.5)^2}{28.5} - \frac{(19-28.5)^2}{28.5} - \frac{(12-21.5)^2}{21.5} - \frac{(31-21.5)^2}{21.5} = 14.72 \]

Null hypothesis rejected at the five per cent level of confidence.

**Emotional Stability.** Chi-square test yielded a value of 14.43. Null hypothesis rejected.

**Industry.** Chi-square test yielded a value of 7.08. Null hypothesis rejected.

**Initiative.** Chi-square test yielded a value of 16.02. Null hypothesis rejected.

**Personal Appearance.** Chi-square test yielded a value of 13.04. Null hypothesis rejected.

**Responsibility.** Chi-square test yielded a value of 11.57. Null hypothesis rejected.

Twelfth Grade Students

Co-operation. Chi-square test yielded a value of 17.65. Null hypothesis rejected.


Industry. Chi-square test yielded a value of 7.08. Null hypothesis rejected.

Initiative. Chi-square test yielded a value of 14.44. Null hypothesis rejected.

Personal Appearance. Chi-square test yielded a value of 23.08. Null hypothesis rejected.


Social Acceptance. Chi-square test yielded a value of 27.43. Null hypothesis rejected.
APPENDIX E

CHI-SQUARE TESTS OF ALL TRAITS COMBINED

<table>
<thead>
<tr>
<th>Level of confidence:</th>
<th>.10</th>
<th>.05</th>
<th>.01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table of chi-square at 1 degree freedom:</td>
<td>2.706</td>
<td>3.841</td>
<td>6.635</td>
</tr>
</tbody>
</table>
