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An Examination of Fifth Grade Instrumental
Music Programs and Their Relationships with
Music and Academic Achievement

by

David M. Holmes

A dissertation submitted in partial fulfillment
of the requirements for the degree of

Doctor of Philosophy

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Approved by Thomas Whitley
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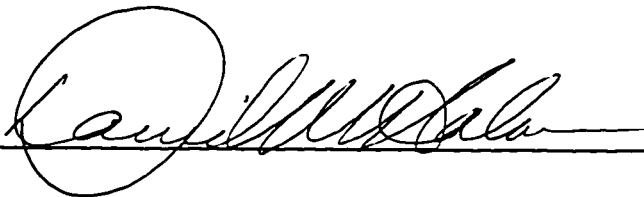
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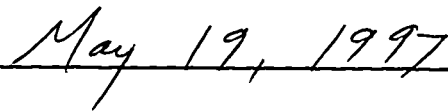
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University of Washington

Abstract

An Examination of Fifth Grade Instrumental Music Programs and Their Relationships with Music and Academic Achievement

by David M. Holmes

Chairperson of the Supervisory Committee:
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With ever-increasing demands on the elementary school curriculum, and consequent endeavors to remove all but the basic necessities from the curriculum, there arises an urgent need for objective data related to the effect music education has on both music and academic achievement. This study was designed to examine the effects of selected factors of students who participate in elementary instrumental music programs on their music and academic achievement. A comparison was conducted between students in the fifth grade who participated in instrumental music education programs and students who do not participate in instrumental music education programs on scores of Music Achievement Test Level I (1969) and of the Comprehensive Test of Basic Skills (1989). This study evaluated the extent that participation in these programs had on both music achievement and academic achievement.

After three years of data collection, analysis of data from 389 students in nine schools across three school districts, the data indicates that participation in instrumental music had no effect on academic achievement as measured by scores of the Comprehensive Tests of Basic Skills. The data indicate that those

students with higher academic achievement scores in fourth grade are those students that elect to participate in instrumental music. The data further indicate that there is a statistical significant relationship between instrumental music instruction and music achievement as measured by scores of Colwell's Music Achievement Test, Level 1. For demographic variables (gender, piano proficiency, other musical instruments, outside of school participation in music, parental education level, and parental involvement in music), there was no statistical significant relationship with participation in instrumental music instruction.

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Finally, I would like to dedicate this project to the memory of my father. While his own formal education was very limited, he instilled in his sons a respect and love for learning that has sustained and nurtured us through all these years. Of all the pleasures I have in the completion of this project, the greatest is in the knowledge that his dreams were fulfilled.

CHAPTER I

INTRODUCTION

Much of the past and present literature in music education is devoted to issues of advocacy regarding the retention of music in the school curriculum (Carlsen, 1984; Eisner, 1982; Lehman, 1993; Phillips, 1993). The development in 1994 of the National Standards for Arts Education, in which music is included, is striking evidence of the results of these advocacy efforts. The standards have the potential to shape and transform the future of music education in profound and far-reaching ways.

With the ever-increasing demands that have been placed on schools by the general public and consequent endeavors by curriculum designers to remove all but the "basic necessities" from the curriculum, there has arisen in recent years an urgent need for objective data related to the effect that music education has on children's musical and academic achievement. While much of the assessed data has focused on the secondary levels (Oddleifson, 1992; Paynter, 1982; Reimer, 1982; Schuler, 1990), Lamar states that "early exposure to music is essential to the child's later interest, skill, and aesthetic response" (1989, p. 3). Consequently, it is important for educators to have accurate information regarding children's intellectual, social, and emotional development in their early years of education in order to make effective decisions about what to include in the elementary school curriculum. As Schuler (1990) points out, "the process of

achieving curricular status for the arts will be a long and difficult one, but the very survival of arts programs depends upon the success of arts educators in attaining this goal. They must examine curricular practice and apply it to the arts" (p. 1).

One area of controversy is the beginning instrumental programs that are frequently initiated during the fifth grade year. The time students spend in instrumental music instruction is often viewed by parents, teachers and administrators through "conventional wisdom" as having a detrimental effect on their academic growth.

Statement of the Problem

This study was designed to examine the effects of selected factors of students who participate in "pull-out" instrumental music programs on their music and academic achievement. Specifically, a comparison was conducted between students in the fifth grade on scores of the Music Achievement Test Level I (MAT1) and of the Comprehensive Test of Basic Skills (CTBS). This study evaluated selected fifth-grade instrumental music pull-out programs, and the effects that participation in these programs had on both music achievement and academic achievement when compared to students not participating in fifth-grade instrumental music pull-out programs. In order to address this problem, five subproblems were developed to guide the research:

- 1) To what extent do fourth grade academic achievement scores differ for students who participate in instrumental music education programs from those students who do not participate in instrumental music education programs?
- 2) To what extent do fifth grade music achievement scores differ for students who participate in instrumental music education programs from those students who do not participate in instrumental music education programs at the beginning of the fifth grade year?
- 3) To what extent do fifth grade music achievement scores differ for students who participate in instrumental music education programs from those students who do not participate in instrumental music education programs at the end of the fifth grade year?
- 4) To what extent do sixth grade academic achievement scores differ for students who participate in instrumental music education programs from those students who do not participate in instrumental music education programs?
- 5) To what extent is the relationship between selected demographic factors and participation in instrumental music education programs?

Need for the Study

It is self-evident that to include a subject in a curriculum, the subject must benefit the student. While there is general agreement that participation in the arts is of benefit to students (Eisner, 1982; Leonhard, 1985), there is a lack of specific empirical evidence supporting this position. Many music programs fall under scrutiny through the pervasive belief that students suffer from the corresponding lack of academic instructional time when removed for music class (Andrews & Cockerille, 1958; Henry, 1958; Wilson, 1941). Although it is expected that students will maintain their studies, and there is evidence that

education in music has a positive influence on other academic areas (Gardner, 1983; Langer, 1942), instrumental music pull-out programs are still perceived by many as a liability to the students' overall academic growth.

Previous research on the relationship between music education and musical and academic achievement has primarily focused on the general areas of musical aptitude and attitude, but not achievement. Lamar's study (1989) was based on the thesis that aptitude is developmental in nature until age nine. Hobbs (1985) indicated that tests of music aptitude and academic achievement measure similar forms of mental processing. Phillips (1976) indicated a positive relationship between musicality and intelligence, although the correlation is "consistently low" (p. 16), while Sparks (1990) examined whether self-evaluation had an effect on attitude and achievement in music of elementary students.

Few studies have been initiated that examine the relationship of music instruction to music achievement or academic achievement. Hedden (1982) examined the relationship between music achievement as measured by Colwell's Music Achievement Test, Level 1 and a set of predictor variables; academic achievement, attitude towards music, music background, and gender. The results indicated that academic achievement was "the best single predictor of music achievement" (p. 67). Hedden referred to additional studies that reported academic achievement as the single best indicator of potential musical achievement. These studies also indicated that musical background (previous lessons, music in the family) is a strong indicator, while musical aptitude, as measured by the Attitude Toward Music Scale (a measuring instrument designed

by Hedden), "is a less effective predictor" (p. 63). More recently, Dryden's (1992) study examined the influence of instrumental music instruction on the academic achievement of fifth grade students. Results indicated that students receiving music instruction had a greater reading vocabulary and scored higher on measures of total reading achievement.

Further research is needed to investigate the effects of music education on both musical and academic achievement, as well as the relationship of measured intelligence on musical achievement. Hinton (1968) stated "the measurement of music achievement has been strangely neglected" (p. 3), and the neglect continues today (Sparks, 1990). Accurate and conclusive data is needed if solid decisions regarding curriculum content are to be made. Hinton (1968) advised that "thorough and regular assessment of all phases of the curriculum is necessary if students are to grow in knowledge and skill, if instruction is to be improved, and if educators are to know the results of their work" (pp. 1-2). If accurate decisions are to be made regarding the inclusion of pull-out instrumental music education programs in the fifth grade curriculum, accurate data need to be produced.

Scope and Delimitations

The study was limited to three school districts. The criteria for selecting these school districts were 1) the use of a traditional fifth-grade pull-out instrumental music program as compared to other types of scheduling fifth-grade

instrumental music instruction, and 2) the administration of the Comprehensive Test of Basic Skills in the sixth grade as well as fourth grade.

Definitions of Terms and Tests

Pull-out instrumental music program. This term refers to the process typically used in fifth grade to provide beginning music instruction on either band or orchestral instruments. Students are given the option at the beginning of their fifth grade year to participate in instrumental music provided by the district, but not all students choose to participate. Those students who choose to participate are "pulled out" of their regular classroom instruction time (often twice a week for forty-five minutes) while students who choose not to participate in instrumental music remain in their regular classroom.

Musical Achievement Test, Level 1 (MAT1). This test was used for both the pretest and the posttest in music achievement. Hedden (1982) selected this test because of its "demonstrated reliability and validity..., its suitability for elementary school students, and its length" (p. 64), all necessary factors for this study. Colwell (1969) described the MAT1 as "designed to provide accurate measurement of achievement for some of the most important objectives of the music education program" (p. 26). Level 1 covers "the areas of pitch discrimination (high and low), interval discrimination (skipwise and scalewise),

and meter discrimination (duple and triple meter)" (p. 26). Tests were scored by hand.

The Comprehensive Test of Basic Skills (CTBS). This test is the instrument used for academic achievement in this study. It is published by McGraw-Hill and measures achievement in the following areas: reading (vocabulary, comprehension, spelling, language mechanics and language expression), arithmetic (computations, concepts, and application), study skills, science, and social studies (Buros, 1974, p. 10). It is reported to have high criterion-related validity with the California Achievement Test, meeting the demands for "accountability and criterion-referenced, or objectives-referenced, testing to focus classroom teacher attention on individual mastery of basic skills" (Kramer & Conoly, 1992, p. 41). The Comprehensive Test of Basic Skills is commended for "generally sound quality and great adaptability...(and for) broadening the standardization sample to be more proportionately inclusive of all the children of all the people" (Kramer & Conoly, 1992, p. 43).

CHAPTER II

REVIEW OF RELATED LITERATURE

A review of research shows that little investigation has been conducted specifically examining the correlation of music achievement and academic achievement. This relationship, however, has long been discussed in the literature. As early as 1941, it was reported that instrumental pull-out programs "are not always received with enthusiasm by teachers of academic subjects" (Wilson, 1941, p. 220). Kvet (1985) lists other citations from 1960 to 1985 that address the perceived conflict in pull-out instrumental music instruction. The literature contains a body of research dealing with specific issues examined in this study, such as relationships between music achievement and aptitude and other factors. Studies examining these relationships are the areas which will be the primary concern in this chapter.

Descriptive Studies of Music and Academic Achievement

Hinton (1968) investigated students' musical achievement, provisions for music instruction, and the relationship between these two factors in Tennessee elementary schools. Colwell's MAT1 was administered to randomly selected sixth grade students from 22 school districts, with 62 classrooms representing both urban and non-urban areas. Only one school district tested had a mean score

equal to or exceeding the norm established by Colwell. An instructional provisions inventory questionnaire, sent by Hinton to the 22 school districts, revealed that few districts provided adequately for music instruction, but urban systems tended to provide more musical opportunities than non-urban ones. A comparison between achievement scores and instructional provisions of the six districts with the highest achievement scores and the six with the lowest achievement scores indicated that those districts with the highest scores also had the better music instructional provisions.

Phillips (1976) studied the relationship between music aptitude and intelligence. One hundred ninety-four junior high students were chosen for the study. A questionnaire was administered to obtain background information concerning musical attitudes and experiences of students and parents. The students were also administered portions of the Tests of Musical Intelligence (Wing, 1948), the Cognitive Abilities Tests (Thorndike and Hagen, 1973), and the Rhythmic Abilities in Children (Thackray, 1972) test. Analysis of data indicated a strong positive relationship between musicality (as measured by the Wing and Thackray tests) and intelligence (as measured by the Thorndike and Hagen test). Phillips concluded that a home which fosters musicality is one that also fosters intelligence (p. 30).

In a study by Hobbs (1985), analyses were completed to evaluate correlations between music aptitude and scholastic aptitude scores, and between music aptitude and academic achievement scores in first, second, and third grade students. The purposes of this study were to replicate Gordon's findings in the

standardization of the Primary Measures of Music Audiation (1979), to use individually administered intelligence tests instead of the more common group-administered tests, to include first and second grade intelligence scores, and to broaden the geographic parameters. Results of both the music and scholastic aptitude comparisons were similar to those found in the Gordon study. The above mentioned variables did not appear to affect the correlations found in music aptitude and performance intelligence comparisons. Verbal intelligence and music aptitude correlations were stronger in this study's sample but remained within the range of correlations found in other American studies (Bentley, 1966, 1975; Gordon, 1968). Higher correlations, however, were found between academic achievement and music aptitude.

Webb (1985) investigated the relationship between music aptitude scores and intelligence test scores of third grade children. She further investigated whether factors other than intelligence appear to be significant for identification of musical aptitude. Subjects were third grade students in a North Carolina elementary school. They were administered the Primary Measures of Audiation (Gordon, 1979) and the Cognitive Abilities Test (Thorndike and Hagen, 1973). Results indicated a positive but weak relationship between the two scores. The variance in the stepwise regression indicated that factors other than intelligence affected students' scores on music aptitude tests. The author suggested previous musical study, gender, socio-economic status, school attended, the age at which study began, and early musical experiences as factors which may influence musical aptitude tests scores.

Lamar (1989) conducted a study to determine how developmental music aptitude of young children is affected by whether music instruction is conducted by music specialists or by classroom teachers. He compared scores on tests of music aptitude with scores on tests of reading achievement, and scores on tests of music aptitude with scores on tests of mathematic achievement, to determine if the music training background of teachers influenced the relationship between the scores. An ancillary purpose was to determine if supporting evidence indicated whether music specialists or classroom teachers be assigned music instruction in the classroom.

Students from two school systems with differing approaches to disseminating music instruction in elementary grades were selected for use in this study. The two levels were identified as music classes taught by music specialists, and music classes taught by classroom teachers. Thirty-five first grade students and thirty-five fourth grade students from an Alabama school system receiving music instruction from music specialists were selected, and thirty-five first grade students and thirty-five fourth grade students receiving music instruction from classroom teachers were selected for the study. Students were administered Gordon's Intermediate Measures of Musical Audiation to measure musical aptitude, and the Stanford Achievement Test for reading and mathematic achievement scores.

Lamar reported that the difference of music aptitude and reading achievement scores between fourth grade students taught by music specialists and fourth grade students taught by classroom teachers was significant. The

difference in the correlation of scores on music aptitude and mathematics achievement also was significant. In both mathematics and reading achievement, the correlations for students taught music by music specialists were higher than the correlations for students taught music by the classroom teachers. The difference in the correlation of music aptitude scores and mathematics achievement scores between first and fourth grade students taught music by music specialists was significant, with the difference between the correlation of music aptitude scores and reading achievement scores approaching significance.

The difference in the correlations of music aptitude scores and both reading and mathematics achievement scores between first and fourth grade students taught music by classroom teachers was not significant. There was a significant difference between the music aptitude scores of first grade students taught music by music specialists and first grade students taught music by classroom teachers, with students taught music by music specialists scoring higher, but no significant difference was found for instructional level at the fourth grade level.

Descriptive Studies of Demographic Factors and Music And Academic Achievement

Hedden (1982) examined predictors of music achievement for general music students in the upper elementary grades. Measured predictors included attitude toward music, self-concept in music, music background, academic

achievement, and gender. The subjects for the investigation were fifth and sixth grade students in two small mid-western towns. The students at each of the two schools attended regularly scheduled music classes who were taught by a music specialist. Colwell's MAT1 was selected as the criterion measure to be used in the study. A measure of general achievement was provided by the composite score of the Iowa Tests of Basic Skills. Music attitude was evaluated by an investigator-designed instrument, the Attitude Toward Music Scale. The instrument used to measure self-concept was devised by Svengalis (1978), the Self-Concept in Music Scale. Music background was assessed by another instrument devised by Svengalis, the Music Background Scale. The scores from subjects in the two schools were consistent. Of the variables investigated, the academic achievement measure (ITBS) clearly was the best single predictor of music achievement as determined by a multiple regression procedure. Also included in the procedure was the Self-Concept in Music Scale, the Attitude Toward Music Scale, and musical background (p. 67).

Vaughn (1983) researched the relationships of schooling variables on the music achievement of fourth-grade Minnesota students. The study investigated the relationship between the performance of fourth grade music students on the Statewide Educational Assessment of Music and eight schooling variables chosen from the Minnesota Music Educators Survey (1980). The predictor variables included the number of methods used to teach music, the amount of time with a music specialist and classroom teacher, gender of student, staff development opportunities and compensation, number of part-time and full-time

music specialists, number of classroom preparations of the music specialist, and participation in music activities by the students. Analysis of data revealed that the number of music specialists employed in a school was statistically significant on scores of the Statewide Educational Assessment of Music.

Kehrberg (1989) examined the nature of the relationships that exist between selected outside-of-school factors in a rural ethnic community and five musical characteristics: musical aptitude, general musical achievement, attitude toward music, level of school music participation, and school music achievement. For measuring the criterion variables, Kehrberg selected Gordon's Musical Aptitude Profile (1965) which measures tonal imagery, rhythmic imagery, and music sensitivity; Colwell's MAT Level III, which aurally measures tonal memory, melody recognition, pitch recognition, and instrument recognition; and Mueller's Oregon Scale of Attitude toward Music. The subjects were 169 fourth through twelfth grade students attending school in a rural town in Kansas. Significant findings were: musical aptitude is a potent predictor of general music achievement among the grade school students; instrumental music experience (especially piano) and music reading skills predict general musical achievement; self-perception of overall musical ability appears to be predictive of general musical achievement in the high school students. Kehrberg also tested the extent of the relationship between students' average daily television viewing time and the criterion variables. The negative correlations suggest that increased television viewing time may be deleterious to scores on the dependent variables.

Hufstader (1974) investigated the possibility of using several different variables as predictors of success in beginning instrumental music. The variables were tests of musical aptitude, academic achievement, intelligence, and psychomotor skills. Four different elementary band classes were used as subjects. The band directors were asked to rank their students by ability into three groups; high, medium and low. The high and low groups were used in this study in order to have distinct levels of achievers. The final subject pool included 34 students. The data used to measure academic achievement were the California Test of Mental Maturity (Sullivan et al., 1957), and the California Achievement Test (Tiegs et al., 1957). The data used to measure musicality was A Test of Musicality (Gaston, 1957). A discriminant function analysis was used to analyze the data. All variables were found to make a unique contribution to the prediction of success in beginning instrumental music. The top three variables having predictive value were the California Test of Mental Maturity, A Test of Musicality, and the California Achievement Test (ranked in order of significance).

Klinedinst (1991) conducted a correlation study to examine the capability of 11 variables to predict performance achievement, teacher rating of musical achievement, and music class retention of beginning instrumentalists. The study involved 205 fifth-grade beginning instrumental music students. After a seven month instructional period, student performance achievement was evaluated by three independent judges, music teacher ratings of student progress was obtained, and student retention was tabulated. Data were subjected to

multivariate analyses. Results indicated that scholastic ability, reading achievement, and math achievement had the strongest relationship to both adjudicator and teacher ratings of student performance achievement as measured by Pearson product-moment correlation coefficients (p. 231). Student retention was best predicted by socioeconomic status, self-concept in music, reading achievement, math achievement, and scholastic ability (in order of significance) as determined by a discriminant procedure.

Descriptive Studies of Instrumental Music Instruction and Music And Academic Achievement

In a correlation study, Dryden (1992) investigated the influence of instrumental music instruction, as well as other factors, on the academic achievement of 270 fifth grade students located in a small Midwest town. The independent variables considered were instrumental music status, gender, race, socioeconomic status, family structure, mother's level of formal education, and length of time in the school district. Scores from the Comprehensive Test of Basic Skills, Fourth Edition, Level 15 were used as dependent variables. Level 14 scores from the test were used as covariate measures. All data for the variables were obtained from school district records. One hundred sixty four subjects participated in instrumental music instruction (band or orchestra). Of the 49 tests for differences using separate ANOVA, 10 were significant at the .05 level.

Dryden concluded that band participants had statistically higher reading vocabulary and reading total achievement; males receiving instrumental instruction scored higher statistically in reading vocabulary; and instrumental students whose mothers had a post high school education showed statistically higher achievement in the total score.

Summary

Numerous studies have examined the correlation between specific factors and music and academic achievement, all of which found the relationship between music achievement and academic achievement to be statistically significant. Dryden (1992) further examined this relationship by focusing specifically on instrumental (band) instruction. She stated that:

1. Participants in band had statistically higher achievement in Reading Vocabulary than participants in orchestra or in the control group, and
2. Participants in band had statistically higher achievement in Reading Total than participants in the control group (pp. 35-36).

Certainly the correlation between academic achievement and music achievement deserves further study. Both Dryden and Hedden (1982) investigated extraneous (outside school) factors which may affect both music and academic achievement. These included gender, race, socioeconomic status, family structure, mother's level of formal education, attitude toward music, self-concept in music, and music background. Both researchers found strong relationships among these variables.

It is clear that a research project that incorporates these demographic factors, as well as one that expands the sample to cover a broader base of the student population, would be of benefit. Research indicates a strong relationship between music achievement and academic achievement (Hobbs, 1985; Dryden, 1992; Phillips, 1976). Evidence further indicates that certain socio-economic factors influence both music and academic achievement (Hedden, 1982; Webb, 1985). Would this hypothesis still be statistically significant in a study that covers a broader spectrum of the student population? This research was planned to examine both of these questions.

CHAPTER III

METHOD

This study was designed to examine the effects of selected factors of students who participate in pull-out instrumental music programs on their music and academic achievement. A comparison was conducted between students in the fifth grade who participated in a pull-out instrumental program and of the students who did not participate in a pull-out instrumental program on scores of Colwell's Music Achievement Test Level I (MAT1) and of the Comprehensive Test of Basic Skills (CTBS). This study evaluated selected fifth-grade instrumental music programs, and the effect that participation in these programs had on both music achievement and academic achievement when compared to students not participating in fifth-grade instrumental music pull-out programs.

Sample

Selected school districts in Washington had to meet three criteria in order to participate in this study. First, the selected districts needed to have similar pull-out programs for instrumental music instruction. Not all school districts in the state of Washington use a pull-out program for instrumental instruction during fifth grade. Other ways of providing for beginning instrumental music instruction are to require all fifth grade students to participate in instrumental music during the

school day for the entire year, or to provide the opportunity before the school day actually starts. The pull-out program provides an excellent opportunity for measuring the effect of music instruction on music and academic achievement, having both an experimental group (those enrolled in instrumental music instruction) and a control group (those not enrolled in instrumental music instruction).

The second criteria for the selected school districts was the use of the CTBS during the sixth grade. All districts in Washington give the CTBS during fourth grade as it is state mandated. Sixth grade testing, however, is optional. Further considerations were given to those school districts that already gave the CTBS during sixth grade because a standard instrument for measuring academic achievement is already in place.

Finally, the selected districts needed to have a long-range commitment to the research at both the district level and the local school level. The research was to cover a three-year period. Situations and personnel change over three years, and a commitment for support during these three years was vital to the success of the research. Initial contacts resulted in three school districts with a total of nine different elementary schools (three in school district A, two in school district B, and four in school district C).

District A is a large urban school district in the metropolitan Puget Sound area. Its population is rapidly growing, and the region is experiencing many of the problems typical of rapid growth, such as increased traffic congestion, shortage of

housing, and increased pressure on the schools due to rapid student growth. Student population for school district A was 20,819 on December 1, 1996.

School district B is a suburban school district in the metropolitan Puget Sound area. It consists of one moderately large town and surrounding rural properties. It has a comparatively stable population, and the school district profits from popular local support. Student population for school district B was 18,500 on December 1, 1996.

School district C is considered rural, but serves as an ex-urban community for the greater metropolitan Puget Sound area, and consequently is overall economically advantaged. Student population for school district C was 11,577 on December 1, 1996.

Assessment Instruments

The Music Achievement Test, Level 1 (Colwell, 1969) (MAT1) was used for both the pretest and the posttest in music achievement. This test was chosen because of its consistent reliability and validity, and its suitability for elementary school students, all necessary factors for this study. Level I covers Pitch Discrimination (high and low), Interval Discrimination (skipwise and scalewise), and Meter Discrimination (duple and triple meter). Pitch Discrimination and Interval Discrimination are further broken down into two sub-parts. In Pitch Discrimination, part one supplies the student with two pitches. The student is required to identify which is higher. In part two, three pitches are given, and the

student is required to identify the lowest pitch. In Interval Discrimination, part one supplied a three tone pattern. The student is required to identify if the pattern moves in a scale pattern, or leaps. Part two supplies a short melody, again requiring the student to answer if the melody moves in a scale pattern, or leaps. Meter Discrimination has only one part. Short melodies are played and the student is to decide if they are in 2/4 or 3/4 time signature. The length of the test was 22 minutes. A pilot study administering the MAT1 was undertaken by the researcher in Spring of 1995, and appropriate adjustments were made in testing procedures. All MAT1 tests were scored by hand.

The Comprehensive Test of Basic Skills (1989) (CTBS) was used for academic achievement in this study. It measures achievement in reading, arithmetic, study skills, science, and social studies. The CTBS is used by the participating school districts, with results from the fourth grade and the sixth grade used in this study. Testing for the CTBS is done at the beginning of both the fourth and sixth grade in all three districts. The Fourth Edition of the CTBS is used by all three districts for testing in both the fourth and sixth grade. Levels 14-22 of this edition are overlapping levels designed to cover grades 4-12. At grade 4, Form B, Level 14 was used in all three school districts. At grade 6, Form A, Level 16 was used in all school districts. While these forms and levels are not identical, they are overlapping and "have been designed to be used on grade level." (Kramer & Conoley, 1992, p. 217). The Normal Curve Equivalent scores of the CTBS were used in this study to allow for parametric tests for differences. These scores are derived from the raw data and are normalized for grade level.

Procedures

Approval of the three districts' music coordinators and curriculum directors were obtained prior to the implementation of the study. Discussion included issues of human subjects protection (prior approval for "Research Involving Human Participants" was obtained from the University of Washington; see Appendix A), logistics of administering the MAT1, targeting specific elementary schools, and final arrangements with the participating schools' staff and administration. It was agreed that the researcher would administer both the pretest and posttest of the MAT1, eliminating any potential bias on part of the schools' music instructors.

Students were given negative permission forms to obtain parent approval for participation in this study (Appendix B) through their classroom teachers. Negative permission forms are worded in such a way that the form is returned to the researcher only if the student does not want to participate in the study. Again, reassurances of anonymity were given to all participants and their parents. These forms were collected by the researcher during initial contacts with the schools. Any student not wishing to participate was excused from the testing.

The CTBS scores from the students' fourth grade were also collected during the initial contact with the participating schools (in September 1995). Each school provided the researcher with a computer-generated copy of these scores, again requesting anonymity for all students.

The pretest portion of the MAT1 was administered during a three week period (in September and October, 1995) to all fifth grade students in the nine elementary schools. All testing was done by the researcher at each individual elementary school. The MAT1 was administered to all fifth-grade students in each school, in the gymnasium or cafeteria, for an initial sample size of 643 students from the nine participating elementary schools.

The posttest was administered in May of 1996. Again, all testing was done by the researcher at each individual elementary school, and was administered to all fifth graders in attendance on the test day.

Finally, the sixth grade CTBS testing was done by the individual schools in the fall of 1996. Each elementary school sent a copy of the results to the researcher by mail.

Data collection

Fourth grade CTBS scores for each student (1994 testing) were obtained from each school during the contact and planning for the administration of the MAT1 pretest. These fourth grade CTBS scores were used for the pretest portion of academic achievement. The National Curve Equivalent scores of the CTBS were selected for use in this study, as they are an equal interval score, ranging from 0 to 99, and are derived from the raw scores. National percentile, grade equivalent, and state percentile are all unacceptable for use, in that they are not composed of equal intervals. It was decided to use the Total Battery

Score for each student as the primary measure for pretest and posttest measurement of academic achievement. The main reason for this decision is that many students transferred into the participating districts at the beginning of their fifth grade, and did not show up on the computer printout for the fourth grade CTBS scores. The researcher had to individually find these scores from the students' individual files, and often only the Total Battery Score of the National Curve Equivalent was available.

The MAT1 pretest (Appendix C) was administered in the gymnasium or cafeteria at each of the participating schools. All fifth grade students in each school in attendance the day of testing completed the MAT1 pretest. An overhead copy of the test was used to guide the students, as the students listened to the test over a portable sound system provided by the researcher. The same portable sound system was used in all nine schools. MAT1 testing took approximately 30 minutes at each school, with the actual test lasting 22 minutes. Instructions for completion were read by the researcher to all students, and a brief (five minutes) time was allowed for questions.

The MAT1 pretest was obtained over a three-week period, from mid-September through the first week of October in 1995. Instrumental music instruction was scheduled to begin in mid-October in all participating school districts. The early part of the year is generally used for selection of instruments and finalization of schedule.

The demographic data were also collected during the MAT1 pretest using a simple survey (Appendix D) based on previous studies (e.g. Hedden, 1982).

The questionnaire was completed by each student. The demographic data included gender, piano proficiency (measured as two or more years of piano lessons), other musical instruments (other than piano, band or orchestra instruments), outside school music participation (such as church choir or community groups), if either parent graduated from college (four year school), and if either parent was actively involved with music.

The MAT1 posttest was obtained during a three week period from mid-May through the first week of June of 1996. Testing locations were the same as the pretest for all schools. Procedures for administration of the MAT1 posttest were the same as the pretest, as was the sound system used for actual testing. The time of day varied from pretest to posttest, but no testing occurred outside a five hour period, from 10:00 A.M. until 3:00 P.M. No other data were collected during the MAT1 posttest.

The sixth grade CTBS scores were the final data to be collected. This test was administered by each school in accordance to procedures established by each school district. Testing occurred during the month of October, 1996. Once the scores of the sixth grade CTBS testing was obtained by each school, a copy was sent by mail to the researcher. Again, anonymity for all students was assured.

Initial MAT1 testing resulted in a sample size of 643 ($n = 643$). Due to mortality issues of absenteeism on the day of the MAT1 posttest and unavailability of CTBS scores, the final sample size for which all data was available was 389 ($n = 389$).

Treatment of Data

All scores were analyzed for homogeneity of variance and statistical differences using one-way analysis of variance. Test scores were then examined to determine if instrumental music attracts a cross-section of the district's level of achievement by comparing the fourth grade CTBS scores of those participating in fifth grade instrumental music with those who did not participate using analysis of variance. Also examined were the extent of changes on MAT1 scores after one year of instrumental music study compared to changes for students not in instrumental music.

Additionally, the effect instruction in instrumental music may have on standardized scores on the CTBS (fourth grade compared to sixth grade) was examined by comparing scores of those taking instrumental music versus those not taking the instruction. Analysis of variance was used for this procedure.

Means and standard deviations were determined for six demographic variables. Chi-square analysis was then used to determine if there was a statistically significant relationship between the demographic data and participation in instrumental music instruction.

Finally, the correlation of scores of the MAT1 posttest to increased scores on CTBS were studied to explore any effect that music instruction might have on academic achievement. These scores were examined in conjunction with overall scores for both the MAT1 and the CTBS to determine any differences between those not taking instrumental music instruction, and those having completed a

partial year's instruction and those having completed a full year's instruction. The demographic data were also included in this stage of the analysis to determine if there was any relationship among the eight variables. Discriminant analysis and multiple regression analysis procedures were employed for this part of the investigation.

Validity issues of statistical regression, experimental mortality, and history were controlled by the large sample size. Problems of history were controlled by attempting to test all fifth graders. Additionally, the non-participants and the participants were in equal educational conditions. Problems created by differential selection (self imposed by students who choose instrumental music) will be limited by the large sample size and statistically controlled for by techniques such as analysis of covariance. Experimental treatment diffusion is automatically controlled for by the school in that no students are allowed to join the instrumental music instruction group after a preset time has elapsed (no later than winter break). Having no students join after winter break also helps control for compensatory equalization of treatments, which is usually not a significant problem. Once the initial enthusiasm is over, participation in instrumental music usually involves little or no extraneous motivation.

CHAPTER IV

RESULTS

This study was designed to examine the effects of selected factors of students who participated in instrumental music programs on their music and academic achievement. Specifically, a comparison was conducted between students in the fifth grade on scores of Colwell's Music Achievement Test Level I (MAT1) and of the Comprehensive Test of Basic Skills (CTBS). This study evaluated selected fifth-grade instrumental music pull-out programs, and the effects that participation in these programs had on both music achievement and academic achievement when compared to students not participating in fifth-grade instrumental music pull-out programs. In order to address this problem, five subproblems were developed to guide the research:

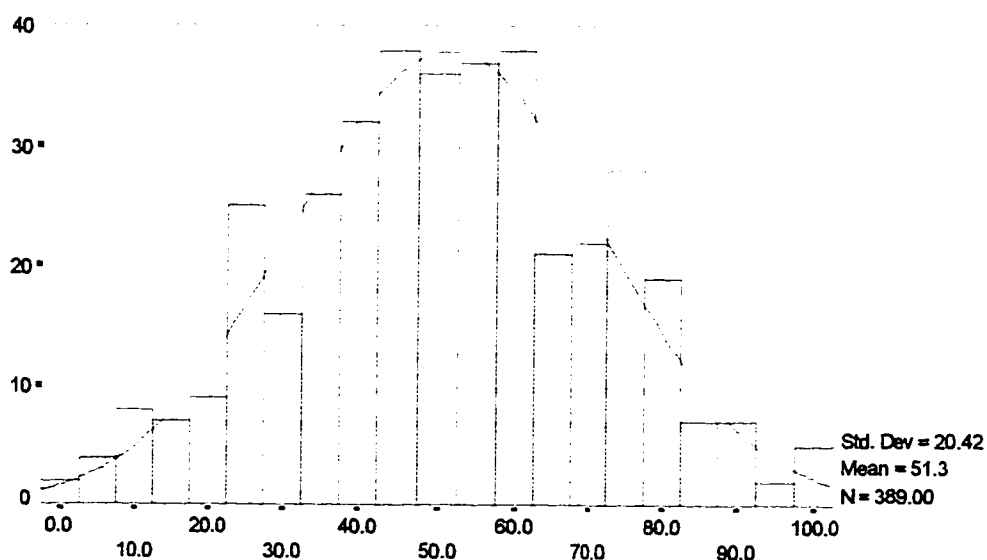
- 1) To what extent do fourth grade academic achievement scores differ for students who participate in instrumental music programs from those students who do not participate in instrumental music education programs?
- 2) To what extent do fifth grade music achievement scores differ for students who participate in instrumental music programs from those students who do not participate in instrumental music education programs at the beginning of the fifth grade year?
- 3) To what extent do fifth grade music achievement scores differ for students who participate in instrumental music programs from those students who do not participate in instrumental music education programs at the end of the fifth grade year?
- 4) To what extent do sixth grade academic achievement scores differ for students who participate in instrumental music programs from those students who do not participate in instrumental music programs?

5) To what extent is the relationship between selected demographic factors and participation in instrumental music programs?

Overview of Data

All analyses of data were completed by the researcher on a standard IBM personal computer using Statistical Package for the Social Sciences (SPSS 6.1) for Windows.

Scores from the fourth grade CTBS scores (academic achievement pre-test) strongly approximated a normal distribution when students from the three school districts were combined (Figure 1).



4th Grd CTBS Total Battery Score (NCE)

Figure 1 - Fourth Grade CTBS Scores Across School Districts

The distribution of the fourth grade CTBS scores are illustrated in Figure 2 which contains a box-and-whiskers plot for each school district. Means and standard deviations of the fourth grade CTBS scores by school district are reported in Table 1.

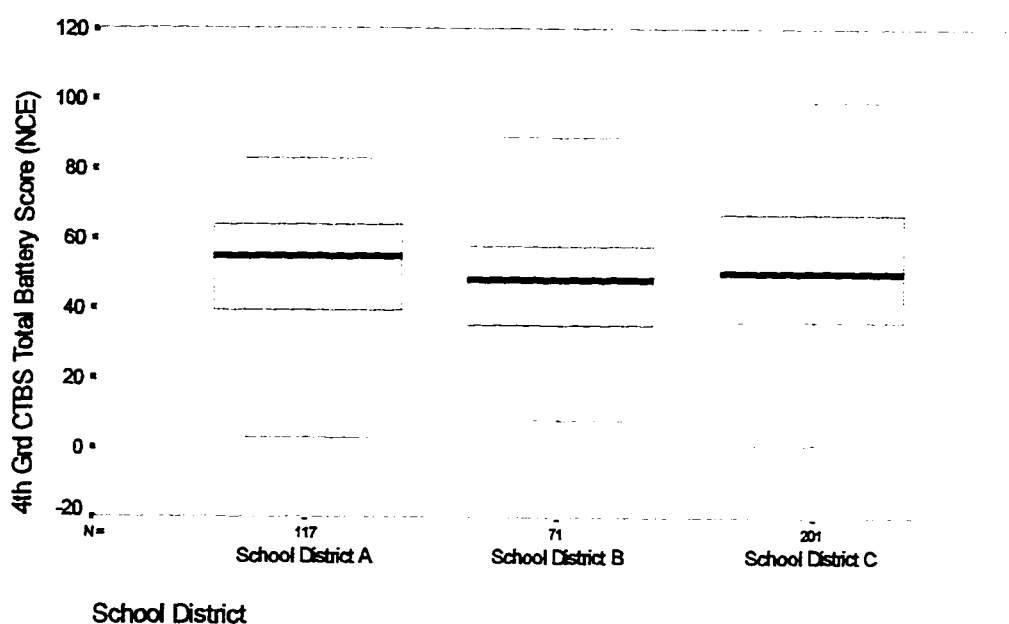


Figure 2 - Distribution of Fourth Grade CTBS Scores Across School Districts

Table 1. Mean Scores and Standard Deviations for Fourth Grade CTBS by School District.

	M	SD	n
School District A	52.62	18.53	117
School District B	48.39	18.51	71
School District C	51.51	22.04	201

When the scores for all fifth grade students were combined, score distribution for the MAT1 pretest also approximated a normal distribution (Figure 3). Figure 4 shows the distribution of the MAT1 pretest scores by the three school districts.

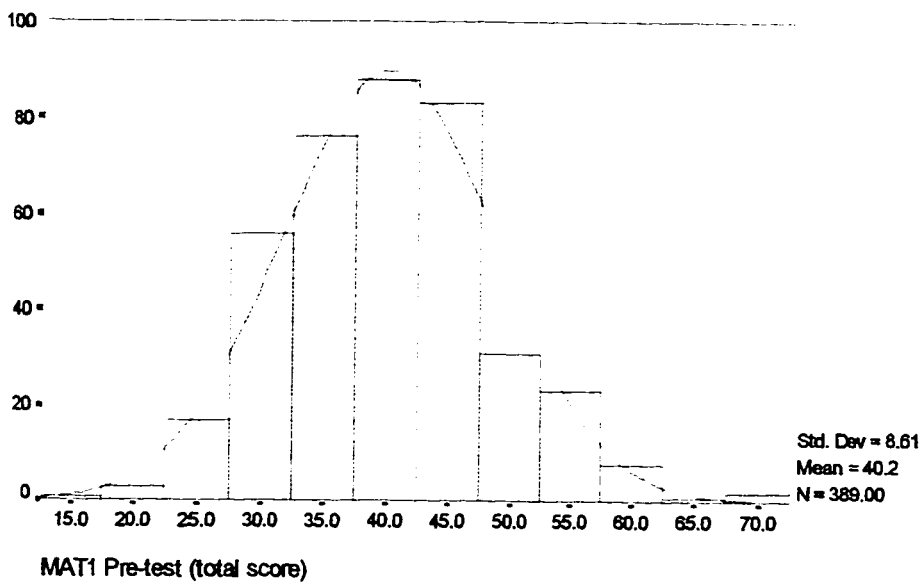


Figure 3 - MAT1 Pretest Scores Across School Districts

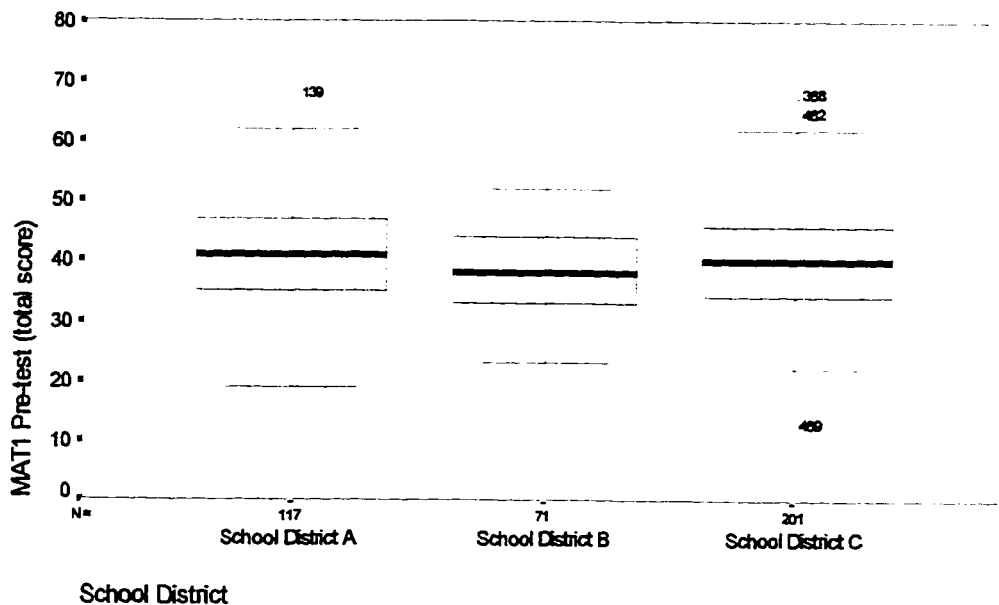


Figure 4 - Distribution of MAT1 Pretest Scores by School District

As can be seen in Figure 4, the distribution was comparable between school district A and school district C, the larger school districts. This may partly be due to the fewer numbers of school district B. Mean scores and standard deviations for MAT1 pretest by school district are contained in Table 2.

Table 2. Mean Scores and Standard Deviations for MAT1 Pretest by School District.

	M	SD	n
School District A	40.99	9.20	117
School District B	38.66	7.19	71
School District C	40.20	8.69	201

Figure 5 contains a histogram illustrating the frequency distribution of all fifth graders who completed the MAT1 posttest. As in earlier histograms, the

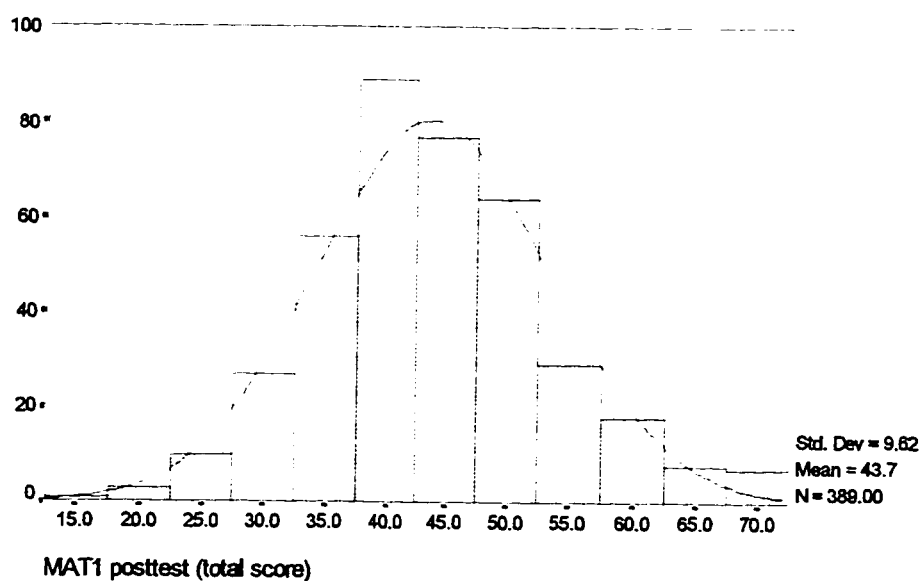


Figure 5 - MAT1 Posttest Scores Across School Districts

superimposed normal curve indicates these data approximated a normal distribution.

Figure 6 contains a box-and-whiskers plot illustrating the distribution of MAT1 posttest scores by the three school districts. Means and standard deviations of the MAT1 posttest by school district are reported in Table 3.

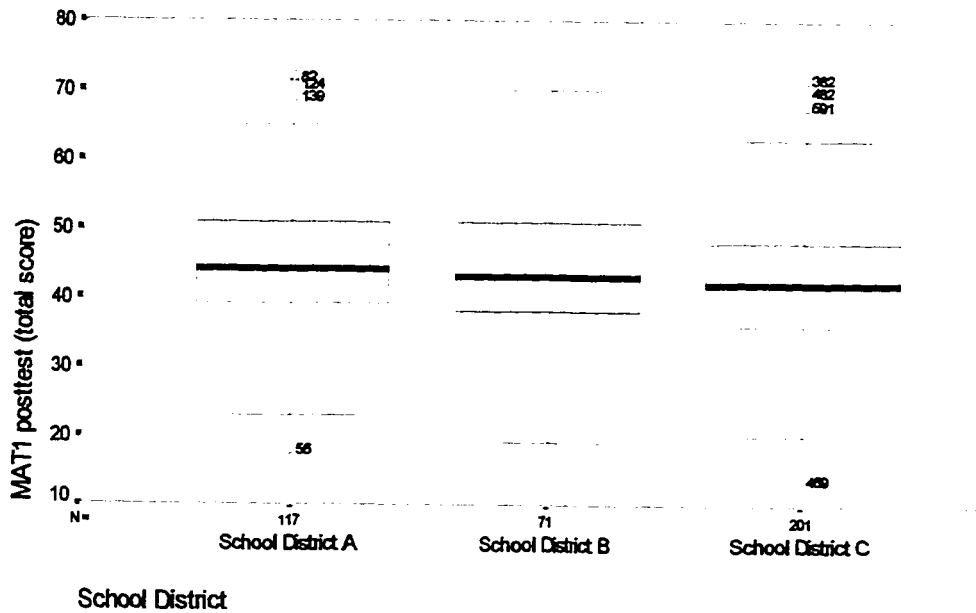


Figure 6 - MAT1 Posttest Scores by School District

Table 3. Mean Scores and Standard Deviations for MAT1 Posttest by School District.

	M	SD	n
School District A	44.89	10.05	117
School District B	44.36	10.51	71
School District C	42.68	8.95	201

Figure 7 contains a histogram illustrating the frequency distribution of the sixth grade CTBS scores (academic achievement posttest). Score distribution for the academic posttest also approximated a normal distribution. Figure 8 contains a box-and-whiskers plot illustrating the distribution of sixth grade CTBS scores by the three school districts. Means and standard deviations of the sixth grade CTBS scores by school district are reported in Table 4.

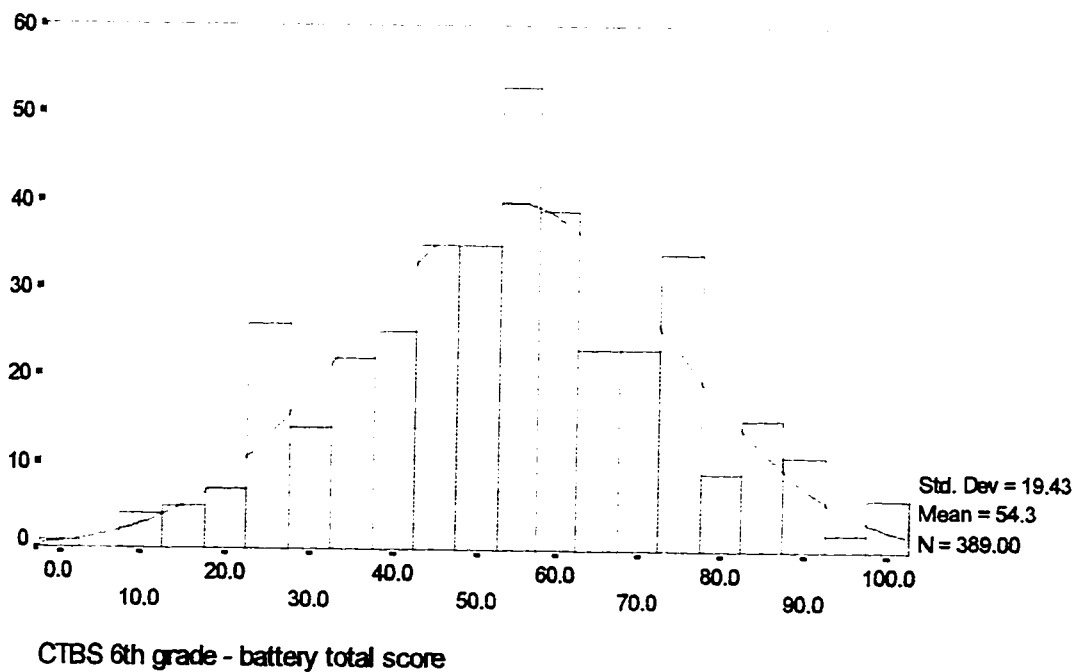


Figure 7 - Sixth Grade CTBS Scores Across School Districts

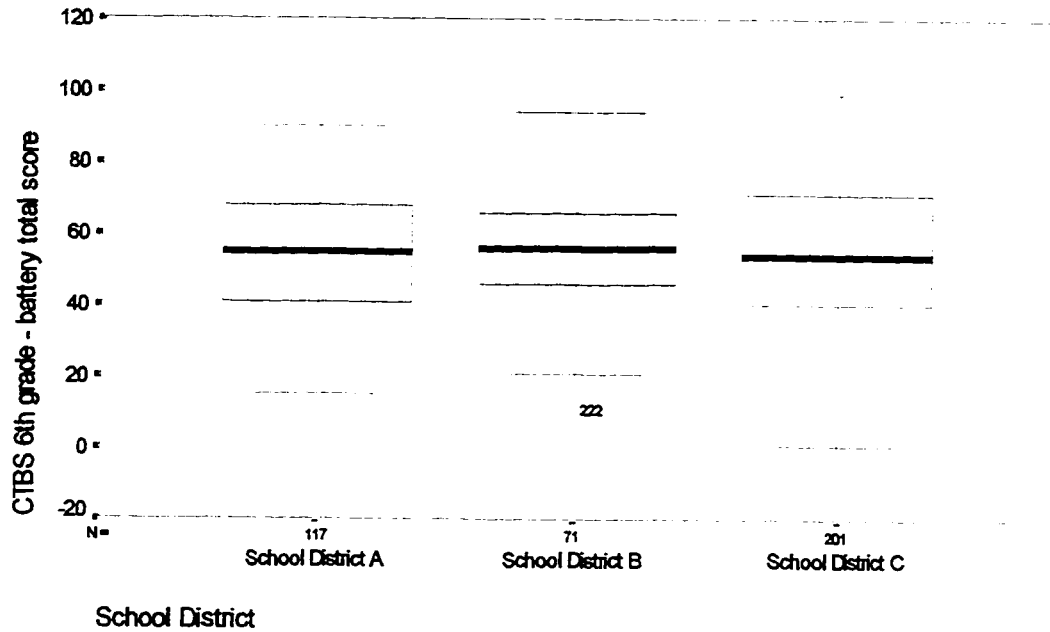


Figure 8 - Distribution of 6th Grade CTBS Scores by School Districts

Table 4. Mean Scores and Standard Deviations for Sixth Grade CTBS by School District.

	M	SD	n
School District A	53.62	17.55	117
School District B	55.24	16.96	71
School District C	54.27	21.26	201

Initial testing, then, resulted in usable data, normally distributed, and without unusual skewness that would prevent the use of parametric tests for differences.

Demographic Data

The demographic factors selected for study were gender, piano proficiency (defined as two or more years of piano lessons), other musical instruments (played by the student), involvement in music outside of school, parent/guardian education, and whether parent/guardian was involved in music. Table 5 contains the results of the combined fifth graders responses. Some variables total less than 389 in that some students did not respond to that particular question.

Table 5. Demographic Variables.

		Not in Inst Music		In Inst Music Partial Year		In Inst Music Full Year		Totals	
Gender	<i>male</i>	74	19.0%	25	6.4%	95	24.4%	195	
	<i>female</i>	93	23.9%	28	7.2%	74	19.0%	194	389
Piano Proficiency	<i>no</i>	139	36.0%	49	12.7%	132	34.2%	320	
	<i>yes</i>	26	6.7%	4	1.0%	36	9.3%	66	386
Other Music Instrument	<i>no</i>	155	40.3%	47	12.2%	154	40.0%	356	
	<i>yes</i>	9	2.3%	6	1.6%	14	3.6%	29	385
Out/School Music	<i>no</i>	129	33.5%	46	11.9%	127	33.0%	302	
	<i>yes</i>	35	9.1%	7	1.8%	41	10.6%	83	385
Parents Graduate	<i>no</i>	31	9.5%	10	3.1%	23	7.1%	64	
	<i>yes</i>	107	32.9%	32	9.8%	122	37.5%	261	325
Parents Involved Music	<i>no</i>	130	33.8%	43	11.2%	139	36.1%	312	
	<i>yes</i>	34	8.8%	10	2.6%	29	7.5%	73	385

Subproblem One

In order to determine the extent that fourth grade academic achievement scores differed for students who participated in instrumental music programs from those students who do not participate in instrumental music education programs, descriptive statistics were calculated. Figure 9 illustrates the participating students' fourth grade CTBS scores as represented by the three levels of instrumental music participation (no participation, partial year participation, and full year participation). Students participating in a full year of instrumental music instruction are represented by the black area (n = 169), students participating for a partial year are represented by the dark grey area (n = 53), and students not participating are represented by the light grey area (n = 167).

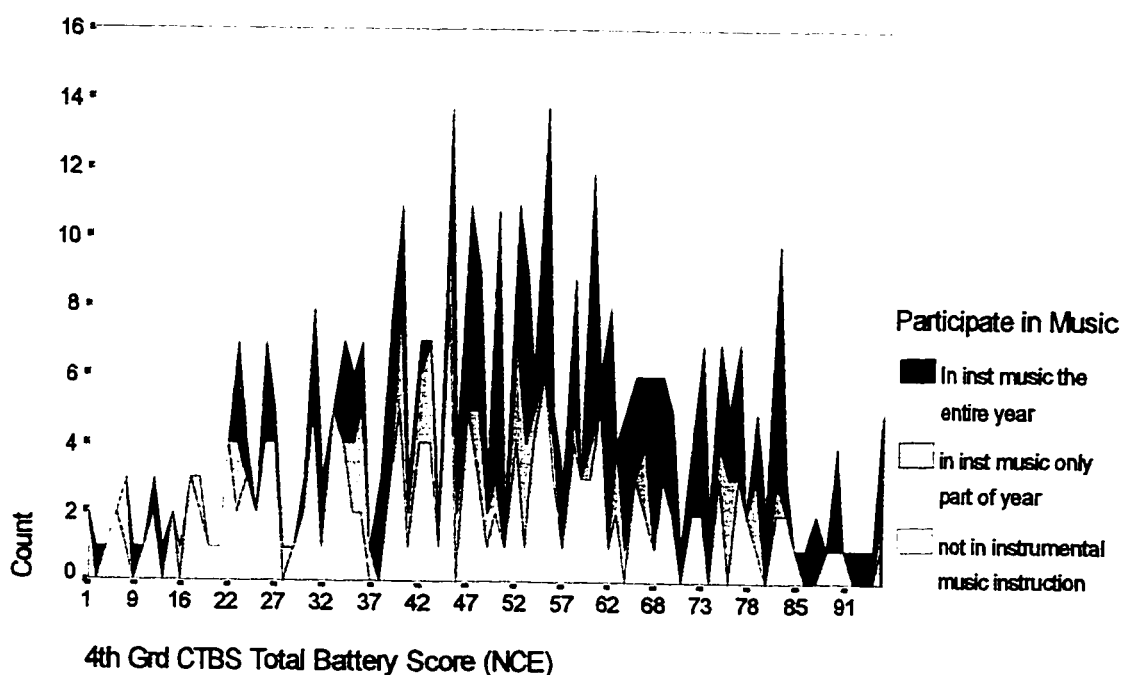


Figure 9 - Area Graph of 4th Grade CTBS Scores Across School Districts

To determine if there was a difference between these three groups on fourth grade CTBS scores, an analysis of variance (ANOVA) test was calculated. In order to gain a clearer perspective of this relationship, the test was first used with all students who participated in instrumental music instruction as a single group and students not participating in instrumental music as a single group. The results are reported in Table 6. The ANOVA indicated a difference between groups [$F = 19.38 (1, 387); p < .01$]. The test for homogeneity of variance reported no violations for parametric tests.

Table 6. Summary of Analysis of Variance for Fourth Grade CTBS Scores and Students Who Elected to Participate in Instrumental Music Instruction.

Source	df	SS	MS	F	p
Between Groups	1	7715.3	7715.34	19.38	.001
Within Groups	387	154059.8	398.1		
Total	388	161775.1			

The students who participated in music were further divided into two sub-groups (those participating a partial year and those participating a full year) with results reported in Table 7. In this analysis, the ANOVA also indicated a difference between groups [$F = 13.13 (2, 386); p < .01$]. The test for homogeneity of variance reported no violations for parametric tests.

Table 7. Summary of Analysis of Variance for Fourth Grade CTBS Scores and Instrumental Music Instruction (two sub-groups).

Source	df	SS	MS	F	p
Between Groups	2	10303.74	5151.13	13.13	.001
Within Groups	386	151471.38	392.41		
Total	388	161775.12			

In summary, the ANOVA demonstrated a significant difference between students who participated in instrumental music instruction and those who did not participate in instrumental music instruction on fourth grade CTBS scores. The difference was significant for both subgroups of students who participated in instrumental music instruction.

Subproblem Two

In order to determine the extent that fifth grade music achievement scores as measured by the MAT1 differed for students who participated in instrumental music programs from those students who did not participate in instrumental music education programs at the beginning of the fifth grade year, descriptive statistics were calculated. Figure 10 illustrates the students' MAT1 pretest scores as represented by the three levels of instrumental music instruction (no participation, partial year participation, and full year participation). Students participating for a full year are represented by the black area (n = 169), students participating for a

partial year are represented by the dark grey area (n = 53), and students not participating are represented by the light grey area (n = 167).

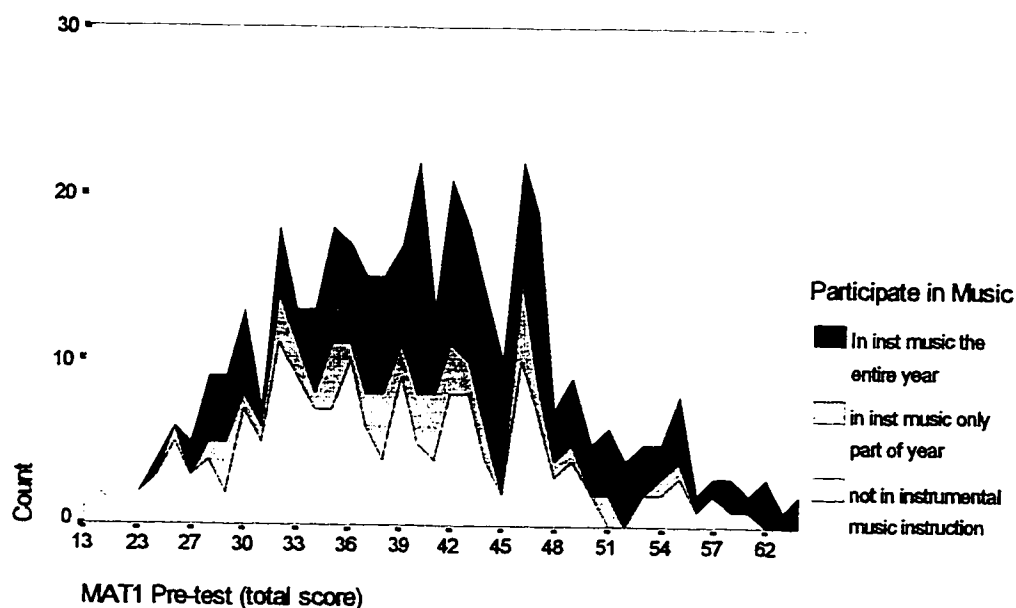


Figure 10 - Area Graph of MAT1 Pretest Scores Across School Districts

To determine if a difference existed between groups on MAT1 pretest scores, analysis of variance (ANOVA) was used. As for the first subproblem, the analysis was first used to test for differences between students participating in instrumental music instruction, and students not participating in instrumental music. Results are reported in Table 8. In this analysis, the ANOVA indicated a difference between groups [$F = 17.80 (1, 387); p < .01$]. The test for homogeneity of variance reported no violations for parametric tests.

Table 8. Summary of Analysis of Variance for MAT1 Pretest Scores and Participation in Instrumental Music.

Source	df	SS	MS	F	p
Between Groups	1	1264.76	1264.76	17.8	.001
Within Groups	387	27504.67	71.07		
Total	388	28769.43			

Then, the instrumental group was further divided into two sub-groups, those participating a partial year and those participating a full year. Results are reported in Table 9. In this analysis, the ANOVA indicated a difference between groups [$F = 11.40 (2, 386); p < .01$]. The test for homogeneity of variance reported no violations for parametric tests.

Table 9. Summary of Analysis of Variance for MAT Pretest Scores and Instrumental Music Instruction (two subgroups).

Source	df	SS	MS	F	p
Between Groups	2	1605.20	802.60	11.40	.000
Within Groups	386	27164.24	70.37		
Total	388	28769.44			

In summary, the ANOVA demonstrated a significant difference between students who participated in instrumental music instruction and those who did not participate in instrumental music instruction on MAT1 pretest scores. The difference was significant for both subgroups of students who participated in instrumental music instruction.

Subproblem Three

In order to determine the extent that fifth grade MAT1 scores differed for students who participated in instrumental music programs from those students who did not participate in instrumental music education programs at the end of the fifth grade year, descriptive statistics were calculated. Figure 11 reports these statistics by illustrating the students' MAT1 posttest scores as represented by the three levels of instrumental music instruction (no participation, partial year participation and full year participation), across school districts. Students participating for a full year are represented by the black area (n = 169), students participating for a partial year are represented by the dark grey area (n = 53), and students not participating are represented by the light grey area (n = 167). A visual comparison between Figure 11 and Figure 10 indicate that there is an increase of scores on the MAT1 posttest for students having finished one year of instrumental music instruction as compared to the other groups. Those students that finished one year of instrumental music instruction had a greater increase in the scores than did the rest of the students.

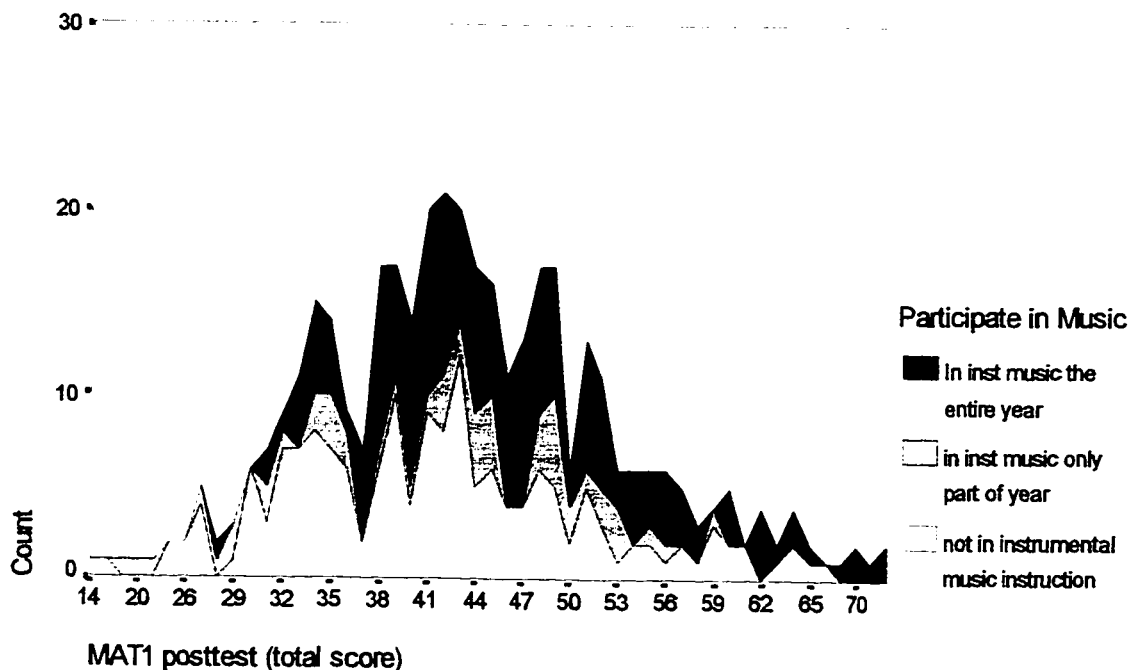


Figure 11 - MAT1 Posttest Scores Across School Districts

Table 10 contains the MAT1 pretest mean scores and standard deviations across school districts for each group of fifth grade students. Table 11 contains the MAT1 posttest mean scores and standard deviations combined across school districts for each group of fifth grade students.

Table 10. Mean Scores and Standard Deviations for MAT1 Pretest for Each Participating Group (School Districts Combined).

	M	SD	n
Full Year Participation	42.41	8.53	169
Partial Year Participation	39.51	6.94	53
No Music Instruction	38.08	8.66	167

Table 11. Mean Scores and Standard Deviations for MAT1 Posttest for Each Participating Group (School Districts Combined).

	M	SD	n
Full Year Participation	46.25	9.08	169
Partial Year Participation	41.75	9.49	53
No Music Instruction	41.63	9.62	167

Figure 12 illustrates the gain scores from the pretest to posttest on the MAT1 for each of the three groups: those participating in instrumental music for the entire year, those participating for part of the year, and those not participating in instrumental music. The increase for those completing the full year of instrumental music instruction is 3.83; the score increase for those participating for a partial year is 2.24; and the score increase for those not participating in instrumental music is 3.55 (the total scale is 1-99).

Music Achievement Test Scores

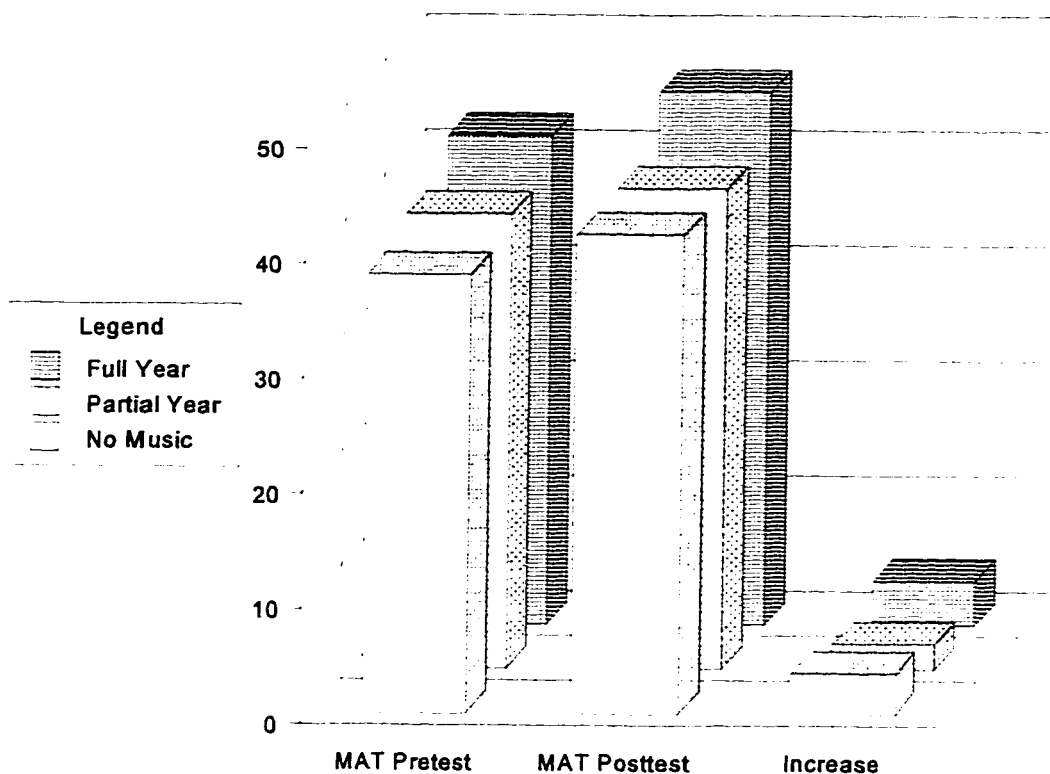


Figure 12 - Gain Scores for the MAT1

To determine if there was a difference between participating groups and MAT1 gain scores, Analysis of Covariance (ANCOVA) was used. This test is quite robust, and is able to partition the amount of variance on the gain scores of the MAT1 (using the pretest as a covariate) to being in instrumental music. In order to gain a clearer perspective of this relationship, the test was initially calculated to determine differences between all students participating in instrumental music instruction, and students not participating in instrumental

music. The results are listed in Table 12. No difference was found for gain scores [$F = 2.41 (1, 386)$; $p = .121$]. The test for homogeneity of variance reported no violations for parametric tests.

Table 12. Summary of Analysis of Covariance for MAT1 Posttest Scores and Instrumental Music Instruction with MAT1 Pretest Scores as a Covariate.

Source	df	SS	MS	F	p
Music Instruction	1	151.24	151.24	2.41	0.121
Regression	1	10516.75	10516.75	167.79	.000
Within+Residual	386	24194.11	62.68		
Model	2	11711.73	5855.86	93.43	.000
Total	388	35905.84	92.54		

The experimental group was further broken down into two sub-groups (those participating a partial year and those participating a full year) with results listed in Table 13. In this analysis, the ANCOVA indicated a difference between groups [$F = 3.61 (2, 385)$; $p = .028$]. The test for homogeneity of variance reported no violations for parametric tests.

Table 13. Summary of Analysis of Covariance for MAT1 Posttest Scores and Instrumental Music Instruction (two subgroups) with MAT1 Pretest Scores as a Covariate.

Source	df	SS	MS	F	p
Music Instruction	2	448.53	224.27	3.61	.028
Regression	1	9999.27	9999.27	161.10	.000
Within+Residual	385	23896.82	62.07		
Model	3	12009.02	4003.01	64.49	.000
Total	388	35905.84	92.54		

In summary, the ANCOVA demonstrated a significant difference between students who participated in instrumental music instruction and those who did not participate in instrumental music instruction on MAT1 posttest scores (using the MAT1 pretest as a covariate). The difference was significant for both subgroups of students who participated in instrumental music instruction.

Subproblem Four

In order to determine the extent that sixth grade academic achievement scores differed for students who participated in instrumental music programs from those students who did not participate in instrumental music programs, descriptive statistics were calculated. These descriptive statistics are first illustrated in Figure 13 by an area graph of the students' sixth grade scores as represented by the three levels of instrumental music instruction (no participation, partial year participation, and full year participation) across school districts. Students participating for a full year are represented by the black area ($n = 169$), students participating for a partial year are represented by the dark grey area ($n = 53$), and students not participating are represented by the light grey area ($n = 167$). The results in Figure 13 indicate that students having finished one year of instrumental music instruction have higher overall scores on the sixth grade CTBS when compared to the other groups. Table 14 shows the sixth grade CTBS mean scores and standard deviations for each of the groups.

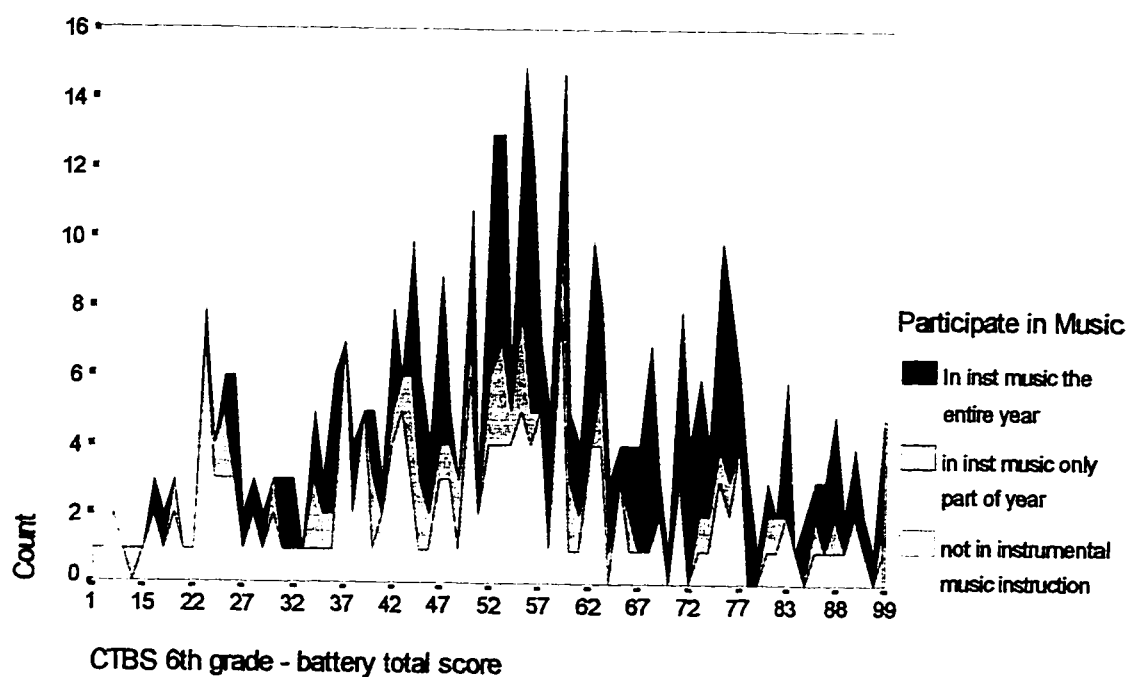


Figure 13 - Sixth Grade CTBS Scores Across School Districts

Table 14. Mean Scores and Standard Deviations for Sixth Grade CTBS Scores Across School Districts.

	M	SD	n
Full Year Instruction	59.72	17.89	169
Partial Year Instruction	52.43	17.91	53
No Music Instruction	49.30	20.04	167

To determine if there was a difference between groups on scores of the CTBS, Analysis of Variance (ANOVA) was calculated. To gain a clearer perspective of this relationship, the test was again first used to test for differences

between all students participating in instrumental music instruction to students not participating in instrumental music on CTBS gain scores. Results are reported in Table 15. The ANOVA did indicate a difference between groups [$F = 19.95 (1, 387); p = .0000$]. The test for homogeneity of variance reported no violations for parametric tests.

Table 15. Summary of Analysis of Variance for CTBS Scores and Instrumental Music Instruction

Source	df	SS	MS	F	p
Between Groups	1	7177.4	7177.4	19.95	.0000
Within Groups	387	139231.9	359.8		
Total	388	146409.3			

The instrumental group was further broken down into two sub-groups (those participating a partial year and those participating a full year) on CTBS gain scores. Results are reported in Table 16. The ANOVA did indicate a difference between groups [$F = 13.12 (2, 386); p = .0000$]. The test for homogeneity of variance reported no violations for parametric tests.

Table 16. Summary of Analysis of Variance for CTBS Scores and Instrumental Music Instruction (two subgroups).

Source	df	SS	MS	F	p
Between Groups	2	9316.90	4658.45	13.12	.0000
Within Groups	386	137092.42	355.16		
Total	388	146409.31			

In summary, the ANOVA demonstrated a significant difference between students who participated in instrumental music instruction and those who did not participate in instrumental music instruction on sixth grade CTBS scores. The difference was significant for both subgroups of students who participated in instrumental music instruction.

Subproblem Five

In order to determine the extent of the relationship between selected demographic factors and participation in instrumental music programs, non-parametric statistics were used, due to the nominal data. Chi-Square values between the six demographic factors and participation in instrumental music were calculated. Results across school districts are reported in Table 17.

Table 17. Results of Chi-Square Tests of Demographic Factors by Participation in Instrumental Music Instruction.

Demographic Variable	Chi-Square Value	DF	Significance
Gender of Student	4.93842	2	0.08465
Piano Proficiency	5.84251	2	0.05387
Other Musical Inst	2.23111	2	0.32773
Outside School Music	2.99505	2	0.22368
Parents' Education	2.46559	2	0.29148
Parents In Music	0.65058	2	0.72232

In referring to a Chi-Square distribution table (Dayton, 1970, p. 393), with 2 degrees of freedom the minimum level for significance ($p = .05$) is 5.99. As can be seen from Table 17, no demographic variables meet this minimum significance, although piano proficiency does come close. The SPSS analysis also computes a Pearson's R and a Spearman correlation value for each of these demographic variables. The Spearman value will be referred to as it is more appropriate for non-parametric data. These values are reported in Table 18. As can be seen, none of these values approach significance.

Table 18. Spearman Correlation Value of Demographic Factors by Participation in Instrumental Music Instruction.

Variable	Value	Significance
Gender of Student	-0.11069	0.02904
Piano Proficiency	0.07054	0.16662
Other Musical Instrument	0.04961	0.33166
Outside School Music	0.03522	0.49079
Parents' Education	0.07805	0.16038
Parents Involved in Music	-0.04109	0.42145

Multivariate Relationships

In order to determine the combined relationships with the measured variables to participation in fifth grade instrumental music instruction, a stepwise

discriminant analysis function was calculated. Variables were entered to examine the influence of gender of student, piano proficiency, other musical instrument, outside school music, parents' education, parents' involvement in music, fourth grade CTBS scores and the MAT1 pretest. At step one, fourth grade CTBS scores were listed as having the highest relationship with participation in instrumental music instruction. At step two, the MAT1 was included. No other variables were included after step two due to minimum tolerance levels not being reached. The results are reported in Table 19.

Table 19. Summary of Discriminant Analysis of Measured Variables to Participation in Fifth Grade Instrumental Music Instruction.

n = 324				
At step 1, 4th Grade CTBS Scores were included in the analysis.				
		Degrees of Freedom		Signif.
Wilks' Lambda	.93811	1	2	321
Equivalent F	10.58861	2	321	.0000
At step 2, MAT1 Pretest was included in the analysis.				
		Degrees of Freedom		Signif.
Wilks' Lambda	.91131	2	2	321
Equivalent F	7.60504	4	640	.0000
Variables not in the Analysis after Step 2 (F level or tolerance or VIN insufficient for further computation).				
<u>Variable</u>	<u>Minimum Tolerance</u>	<u>Tolerance</u>	<u>F to Enter</u>	<u>Wilks' Lambda</u>
Gender	.9908243	.8656584	1.6996522	.9009675
Keyboard Proficiency	.8982122	.8130492	1.7074169	.9009241
Other Musical Instrument	.9943058	.8684809	1.8912664	.8998978
Outside School Music	.9908044	.8663488	.9879702	.9049628
Parent Graduate College	.9660282	.8628254	.2208346	.9093093
Parent Involved Music	.9738900	.8536224	.9873867	.9049661

Finally, in a similar analysis, to determine the influence on sixth grade CTBS scores, the measured variables (gender of student, piano proficiency, other musical instrument, outside school music, parents' education, parents' involvement in music, fourth grade CTBS scores, MAT1 pretest, MAT1 posttest, and instrumental music instruction participation) were entered in a stepwise multiple regression analysis. At step one, the MAT1 posttest was listed as having the highest relationship with sixth grade CTBS scores. At step two, the MAT1 pretest was included. At step three, instrumental music instruction was included. The combined variance for these three variables was 22%. No other variables were included after step three due to minimum tolerance levels not being reached. The results are reported in Table 20.

Table 20. Summary of Multiple Regression Analysis of Listed Variables to Sixth Grade CTBS Scores.

Variable	B	SE B	Beta	T	Sig. of T
Step 1					
MAT1 Posttest	.814126	.102822	.403690	7.918	.0000
Step 2					
MAT1 Pretest	.576665	.136313	.250850	4.230	.0000
MAT1 Posttest	.538174	.119584	.266858	4.500	.0000
Step 3					
MAT1 Pretest	.522197	.136512	.227156	3.825	.0002
MAT1 Posttest	.501874	.119201	.248858	4.210	.0000
Music Instruction	2.857824	1.061252	.137547	2.693	.0075

Note. $R^2 = .16297$ for Step 1; $R^2 = .20717$ for Step 2; $R^2 = .22474$ for Step 3 ($p < .01$).

CHAPTER V

SUMMARY, CONCLUSIONS and RECOMMENDATIONS for FURTHER STUDY

Summary

This study was designed to examine the effects of selected factors of students who participate in instrumental music programs on their music and academic achievement. Specifically, a comparison was conducted between students in the fifth grade who participated in instrumental music programs and students who did not participate in instrumental music programs on scores of Colwell's Music Achievement Test Level I (MAT1) and of the Comprehensive Test of Basic Skills (CTBS) . This study evaluated selected fifth-grade instrumental music pull-out programs, and the effect that participation by students in these programs had on both music achievement and academic achievement when compared to students not participating in fifth-grade instrumental music pull-out programs. In order to address this problem, five subproblems were developed to guide the research:

- 1) To what extent do fourth grade academic achievement scores differ for students who participate in instrumental music education programs from those students who do not participate in instrumental music education programs?

- 2) To what extent do fifth grade music achievement scores differ for students who participate in instrumental music education programs from those students who do not participate in instrumental music education programs at the beginning of the fifth grade year?
- 3) To what extent do fifth grade music achievement scores differ for students who participate in instrumental music education programs from those students who do not participate in instrumental music education programs at the end of the fifth grade year?
- 4) To what extent do sixth grade academic achievement scores differ for students who participate in instrumental music education programs from those students who do not participate in instrumental music education programs?
- 5) To what extent is the relationship between selected demographic factors and participation in instrumental music programs?

Three school districts were selected that met three criteria: a traditional pull-out instrumental music program for fifth grade, administration of the Comprehensive Test of Basic Skills in both the fourth and sixth grades, and approval of the district's music coordinators and curriculum directors. Issues discussed with district personnel included human subjects protection, logistics of administering the MAT1, targeting specific elementary schools, and agreement from these schools' staff and administration. Students choosing to participate in the study took the MAT1 in September of 1995 as a pretest, and again in May of 1996 as a posttest. Each administration of the test and questionnaire required approximately 30 minutes at each school.

The fourth grade CTBS scores for each participating student was acquired during the time of the MAT1 pretest. The sixth grade CTBS scores were secured by the researcher in the fall of 1996. No names were made public, assuring

anonymity of the students involved. Students in the research were identified only as those having completed one year of instrumental instruction, those completing a partial year of instruction, and those not having participated in instrumental music instruction.

The fourth grade CTBS scores were then examined to determine if instrumental music attracts a cross-section of the district's level of achievement. This study further examined if selected demographic factors influenced who participated in instrumental music. Finally, students who participated in band or orchestra and those who did not were compared on fourth grade CTBS scores , MAT1 pretest scores, MAT1 posttest scores and sixth grade CTBS scores.

Conclusion

Subproblem one examined the extent that fourth grade academic achievement scores differed for students who participated in instrumental music education programs from those students who did not participate in instrumental music education programs. An ANOVA for the two instructional groups and those not receiving instruction with fourth grade CTBS scores indicated a statistical significant difference between groups [$F = 13.13 (2, 386); p < .01$] (see Table 7). This is consistent with research by Hedden (1982), Hobbs (1985), Hufstader (1974), Klinedinst (1991) and Phillips' (1976). Further, the discriminant analysis examining the listed variables also tabulated fourth grade CTBS scores

as having the strongest relationship with participation in instrumental music instruction (see Table 19).

Subproblem two examined the extent that fifth grade music achievement scores (MAT1 pretest) differed for students who participated in instrumental music programs from those students who did not participate in instrumental music education programs at the beginning of the fifth grade year. An ANOVA for the these two variables (MAT1 pretest and participation in music instruction) indicated a difference between groups [$F = 11.40 (2, 386); p < .01$] (see Table 9), indicating that those students with the highest MAT1 pretest scores were the students that participated in instrumental music instruction. These findings were consistent with Hufstader (1974), whose research reported that academic achievement was a strong predictor of success in fifth grade band. The discriminant function also determined a statistical relationship between the MAT1 pretest and participation in instrumental music instruction (see Table 19).

In summary, the results of the data analyses determine that there was a statistically significant difference between groups (those who participated in instrumental music instruction and those who did not participate) on academic achievement (fourth grade CTBS scores) and music achievement (MAT1 pretest). These findings are consistent with other researchers in this field of study (Hedden, 1982; Hobbs, 1985; Hufstader, 1974; Klinedinst, 1991; Phillips, 1976).

Subproblem three examines the extent that fifth grade music achievement scores differed for students who participated in instrumental music education

programs to those students who did not participate in instrumental music education programs at the end of the fifth grade year. As can be observed from the gain scores of each group (those not participating in instrumental music were 3.55; those participating for a partial year were 2.24; those completing the full year of instrumental music instruction were 3.83 as reported in Figure 12), those completing a full year of instrumental music instruction have the largest increase. The increase for the students completing a year of instrumental music instruction could suggest that the year of instruction was significant in gain scores of music achievement. However, students not having instrumental music had the second highest gain, which suggest other issues were influencing this data.

For statistical analysis of this particular question, the primary tool was the Analysis of Covariance (ANCOVA). The ANCOVA examined the relationship between the MAT1 posttest scores to participation in instrumental music with the MAT1 pretest scores used as a covariate. It is effectively able to measure the variance between the two variables without being affected by preconditions existing at the time of the MAT1 pretest. The results of this analysis indicated a significant difference between groups [$F = 3.61 (2, 385); p = .028$] (see Table 12). This is consistent with Hinton (1968) and Vaughn (1983) who reported that better music instructional services resulted in better music achievement scores. Kehrberg (1989) also found that instrumental music experience predicts general music achievement. The results of the research presented in this paper support their findings.

Subproblem four examined the extent that sixth grade academic achievement scores differed for students who participated in instrumental music education programs to those students who did not participate in instrumental music education programs. For statistical analysis of this question, Analysis of Variance (ANOVA) was used. To gain a clearer perspective of this relationship, the test was first used to test for differences between all students participating in instrumental music instruction to students not participating in instrumental music on CTBS gain scores. The ANOVA did indicate a difference between groups [$F = 19.95 (1, 387); p = .0000$] (see Table 15). Then the instrumental group was further broken down into two sub-groups (those participating a partial year and those participating a full year). In this analysis, the ANOVA also indicated a difference between groups [$F = 13.12 (2, 386); p = .0000$] (see Table 16). These results indicate that the relationship between sixth grade CTBS scores and participation in instrumental music instruction was statistically significant. These findings support those of Dryden (1992) who found that students receiving instrumental music instruction also had higher CTBS scores.

Subproblem five examined the relationship between selected demographic factors and participation in instrumental music programs. Analysis of variance was not appropriate for these data, due to their being nominal. Chi-square analyses resulted in no demographic variable reaching a significant chi-square value at the $p = .05$ level of significance, although piano proficiency came close, with $p = .05387$ (see Table 17). Hedden's (1982) research also found that these demographic factors had no relationship with music achievement. These findings

apparently contradict the suggestion by Webb (1985) that certain demographic factors had a relationship with musical aptitude, although Webb was examining music aptitude, not music achievement.

Further clarification of subproblem four, as well as subproblem three, is to be gained from the multivariate procedures (discriminant analysis and multiple regression). The discriminant analysis procedure determines the linear combination of the selected predictor variables on a selected grouping variable. In this study, the grouping variable was participation in instrumental music instruction, with the predictor variables being fourth grade CTBS scores, gender, piano proficiency, MAT1 pretest, outside of school musical participation, proficiency on another musical instrument (other than piano), if parents were involved in music, and parents' level of education. These analyses were further able to examine not only the influence of any given predictor variable, but was also able to detect the interaction of these variables and identify the separate effects within the interaction. It was able to do this in a stepwise fashion, listing the variable that has the most influence first, the second variable second, until a minimum level of significance is reached. It is significant to note that at step one of the analysis, fourth grade CTBS scores were included (see Table 19). At step two of the analysis, the MAT1 pretest scores were included. No other variables were included in the discriminant function. These results further reinforce the conclusions of subquestions one and two.

Sixth grade CTBS scores were then entered into a multiple regression analysis as the dependent variable. The multiple regression procedure estimates

the coefficients of the linear equation, involving a set of independent variables, that best predicts the value of the dependent variable. The independent variables used were gender, piano proficiency, MAT1 pretest and posttest, outside of school musical participation, proficiency on another musical instrument (other than piano), if parents were involved in music, parents' level of education, and status of instrumental music instruction. This procedure also does this in a step-wise fashion, listing the combined coefficient amount of each included independent variable. The results of this analysis list the MAT1 posttest as having the highest variance with sixth grade CTBS scores, with an Adjusted R Square value of .16037 (see Table 20). The MAT1 pretest is listed as having the second highest variance with sixth grade CTBS scores. The combined Adjusted R Square value of these two variables is .20223 (MAT1 pretest contributing .04186 of the variance). The third listed variable having influence on the sixth grade CTBS scores is instrumental music instruction. The combined Adjusted R Square value of these three variables is .21747 (participation in instrumental music instruction contributing .01524 of the variance). No other independent variables were included in the analysis.

There are two implications to be gained from these data. One refers to knowledge as measured through the music achievement tests (MAT1 scores) and how this knowledge is affected by the treatment (instrumental music instruction). The second refers to knowledge as measured through the academic achievement tests (CTBS scores) and how this knowledge is affected by the treatment. In examining the data referring to music achievement tests, the data

indicated that music achievement is a predictor of who will participate in instrumental music, but not a strong predictor, as demonstrated through the results of the discriminant analysis. Further, there is a significant difference between music instruction and gain scores of the MAT1. And this difference remains significant when subjected to an analysis of covariance procedure which controlled for pre-existing music achievement (MAT1 pretest). The difference between fifth grade instrumental music instruction and music achievement is statistically and practically significant.

In examining the data referring to academic achievement, fourth grade CTBS scores were found to be the strongest predictor of participation in instrumental music instruction. This finding is consistent with other research in this area. Further, an ANOVA between sixth grade CTBS scores and participation in music instruction determined a statistical difference between these two variables; this was also true between fourth grade CTBS scores and participation in instrumental music instruction. The multiple regression analysis listed the MAT1 posttest as having the greatest relationship with sixth grade CTBS scores, followed closely by the MAT1 pretest scores and participation in instrumental music instruction. The results of the ANOVA and the multiple regression analysis clearly indicated a statistically significant relationship between music achievement, fifth grade instrumental music instruction, and students' academic achievement.

In summary, the data demonstrated that participation in instrumental music instruction had a significant relationship with academic achievement. These

findings also support those of Phillips (1976), Hobbs (1985), Webb (1985), Lamar (1989), all of whom were examining the relationships between musical aptitude and academic achievement. The data illustrated that students with the highest CTBS scores in fourth grade tend to be the ones who participated in instrumental music instruction, and maintained the highest scores in sixth grade CTBS testing.

The data further indicated that there is a significant relationship between instrumental music instruction and scores of music achievement instruction as measured by the MAT1. This implication is strongest in observation of the mean scores. The group of students having participated in music instruction over the full year had a larger increase than those with partial or no participation. This observation was further reinforced by the findings of the ANCOVA. These findings support those of Hinton (1968), who found that music instruction by music specialists lead to higher music achievement scores as compared to music instruction delivered by the classroom teachers.

The results of the ANOVA between instrumental music instruction, MAT1 and sixth grade CTBS scores, and the results of the multiple regression analysis clearly demonstrated a statistically significant relationship between these three variables. In particular, the combined Adjusted R Square value of .21747 from the multiple regression analysis is not only significant, it is of practical significance. It states that over 20% of the variance of sixth grade CTBS scores was directly due to the interaction of these three variables (MAT1 pretest and posttest scores, and participation in instrumental music instruction). When one considers the large sample size ($n = 389$) and that all probability levels were

below .01, these results take on even greater practical significance. These findings closely parallel and support those of Dryden (1992).

Finally, it must be noted that the data clearly demonstrated that participation in pull-out instrumental music instruction did not have any negative effect upon academic achievement. In all examinations of the relationships between academic achievement and participation in instrumental music instruction on the collected data, the results were consistent; the standard "pull-out" model for fifth grade instrumental music instruction had no negative effect on academic achievement. This was demonstrated through the analysis of variance tests, and the discriminant analysis and multiple regression procedures. Contrary to "conventional wisdom," the time students spend in instrumental music instruction did not have a detrimental effect on their academic growth.

After three years of data collection, analysis of data from 389 students from nine schools in three school districts, the results indicated that participation in instrumental music has a statistically significant relationship with academic achievement as measured by scores of the Comprehensive Tests of Basic Skills. The data further indicated that those students with higher CTBS scores in fourth grade are those students that sign up for instrumental music. The data also demonstrated that there is a statistical significant relationship between instrumental music instruction and music achievement as measured by scores of Colwell's Music Achievement Test, Level 1. In all other variables (gender, piano proficiency, other musical instruments, outside of school participation in music, parental education level, and parental involvement in music), there was no

statistical significant relationship with participation in instrumental music instruction.

Recommendations for Further Study

This study indicated that instrumental music instruction has a significant relationship with academic achievement as measured by the students' scores from their sixth grade CTBS. There is further need to examine this particular relationship. Specifically, it would be helpful to replicate this study using academic pretest and posttest scores from within the same year as the pretest and posttest scores of the music achievement test. Results of this study would likely be reinforced with better overall control of the academic achievement scores in a true pretest and posttest configuration.

Further, it was determined that while academic achievement was the strongest predictor of participation in instrumental music instruction, the year's instruction (treatment) had no effect on the general trend of the academic achievement scores. Nor did any other factors (both examined and not examined) in this research. The relative level of the three test groups' CTBS scores remained constant over two years (see Tables 1 and 14). While this data cannot demonstrate that participation in instrumental music had any causal effect upon academic achievement, it can demonstrate that the extra classroom time gained by students not participating in instrumental music also had no measurable effect, particularly negative effect. It would be useful to see what

factors did affect academic achievement during these two years. Again, a replication with better control of pretest and posttest of academic achievement would be helpful.

Clearly, there is a relationship between academic achievement and participation in instrumental music instruction. This particular research was not successful at uncovering a causal relationship between instrumental music instruction and academic achievement. However, the relationship is there nonetheless. Researchers have long suspected that there is "something" going on between participation in the arts and overall academic standings. This research further reinforces those findings with the results of the analysis of variance test. Moreover, in the multiple regression procedure, of all the listed variables, MAT1 posttest was listed as having the highest correlation with sixth grade CTBS scores. These results clearly demonstrate a statistically significant relationship between these variables.

It is the hope of this researcher that future research will better control for possible confounding issues and have better control of pretest and posttest measures of academic scores, with the intended goal of determining a causal relationship between these two variables. It is in the best interest of education in general, and music education in specific, that this relationship be clearly understood.

Regardless, based upon the results of this research, anyone counselling students of their choices for academic activities would be well advised to have students include participation in instrumental music instruction. This research

shows that participation has no negative effects upon academic standing; it further exhibits that musical knowledge, as well as musical performance skills, are improved. It also reveals that those students who choose to participate in instrumental music instruction are also those students who are doing well in overall academic achievement. It is always in a student's best interest to be with others who are doing well in their academic studies. While this research was not able to identify a causal relationship for this phenomena, nevertheless, the phenomena exists. It behooves all of us in the music education profession to rigorously pursue this phenomena until it is clearly understood.

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APPENDIX A

Human Subjects Approval Form

SCHOOL OF MUSIC

REQUEST FOR REVIEW OF PROPOSED RESEARCH
INVOLVING HUMAN PARTICIPANTSDate: October 25, 1994

1. Principal investigator: David M. Holmes
Academic title or Student status: Doctoral Candidate
2. Names of other investigators: none
3. If a student, name of faculty sponsor: Dr. Thomas Goolsbv
4. Title of proposed study: "An Examination of Fifth Grade Instrumental Music Programs
and their Effect on Scores of the Comprehensive Test of
Basic Skills." September 1995
5. Proposed starting date: September 1995
Anticipated termination date: May, 1997

6. Please answer the questions listed below:	YES	NO
Are any subjects under 18 years of age?	<u>X</u>	<u> </u>
Are any subjects confined in a correctional or detention facility?	<u> </u>	<u>X</u>
Is pregnancy a prerequisite for serving as a subject?	<u> </u>	<u>X</u>
Are fetuses <u>in utero</u> subjects in this research?	<u> </u>	<u>X</u>
Are all subjects presumed to be legally competent?	<u> </u>	<u>X</u>
Are personal records (medical, academic, etc.) used without written consent?	<u> </u>	<u>X</u>
Are data from subjects (responses, information, specimens) directly or indirectly identifiable?	<u> </u>	<u>X</u>
Are data damaging to subjects' financial standing, employability or reputation?	<u> </u>	<u>X</u>
Is material obtained at autopsy used in the research?	<u> </u>	<u>X</u>
Are facilities, staff, or patients from CHMC involved?	<u> </u>	<u>X</u>
Anyone other than individuals named above to interact with participant?	<u> </u>	<u>X</u>
Is the procedure likely to cause the participant any stress or discomfort?	<u> </u>	<u>X</u>
Are there any other potential hazards to the participants?	<u> </u>	<u>X</u>
Is the research grant-supported? (If yes, name the granting agency)	<u> </u>	<u>X</u>
Will the participants receive compensation? (If the reward is not monetary, in what way will participation benefit the participant)	<u> </u>	<u>X</u>
Will participants be fully informed of the procedure to be followed prior to the start of the experiment?	<u>X</u>	<u> </u>

If "YES" is indicated on any of the above questions in 6, please explain.

This study examines fifth grade students, hence all participants are in the fifth grade (11-12 years old).

All participants will be fully informed of procedures both verbally and by written communication prior to study

School of Music
Page 2 of Request for Review

The following statement is from "Ethical Principles in the Conduct of Research with Human Participants". AMERICAN PSYCHOLOGIST, 1973, January, pg. 79, paragraph 5:

Ethical research practice requires the investigator to respect the individual's freedom to decline to participate or to discontinue participation at any time. The obligation to protect this freedom requires special vigilance when the investigator is in a position of power over the participant. The decision to limit this freedom increases the investigator's responsibility to protect the participant's dignity and welfare.

When and how do you inform the participant that he may decline to participate, and that he may withdraw at any time?

Verbally and by written communication prior to study. All participants must have parent signature of consent prior to testing.

When and how may the participant indicate he does not wish to participate or wishes to withdraw from the experiment?

Student may tell investigator prior to study or student (or parent) may telephone investigator at home (number will be provided).

If any deception is to be practiced on the participant, describe:

none

NOTE: The following items must be attached to this Request for Review:

1. Two copies of a prospectus of the research
2. Two copies of the Consent Form

PRINCIPAL INVESTIGATOR'S SIGNATURE:

DATE: 10/25/94

FACULTY CERTIFICATION: I certify that this research is exempt from federal regulations and that it is in accord with the general principles stated in the UJW handbook, Vol. IV, Part II, Ch. 2, Sec. 1.

FACULTY SPONSOR SIGNATURE:

DATE: 10/25/94

DIRECTOR OR DESIGNEE:

ACTION

APPROVE

DISAPPROVE

DATE

x

10/25/94

Approved starting date: _____

Anticipated termination date: _____

SIGNATURE: _____

VALID FOR FIVE YEARS AS LONG AS APPROVED PROCEDURES ARE FOLLOWED

APPENDIX B

Negative Permission Form

TO: Parents and Students of _____ Elementary School

FROM: David M. Holmes

RE: Research Proposal

It is my privilege to inform you that your school has been chosen for a pilot study in gain scores in music education. In view of coming changes due to the *Goals 2000: Educate America Act* (signed into law March 31, 1994). This study should provide useful and pertinent information on the status of music education in your school district.

In brief, the study will involve a 90 minute standardized music achievement test. This test will be given twice: once in October, and once in May. I will be happy to provide you with results of your child's gain scores on this test to determine your child's progress.

Researchers at the University of Washington request permission not only to provide your child the opportunity to take this music assessment, but to also correlate these scores with your child's CTBS results from last year and next year. The CTBS is automatically taken by every student in your child's class. These correlations will be done outside the district by computer through the use of coded data and combined scores of more than 1000 children in the state of Washington to guarantee anonymity.

No names will be made public, assuring anonymity of all students involved. Further, all data will be combined to assure the anonymity of the volunteer school districts.

If you have any questions or concerns, please feel free to call me at my home (206-486-2464). I would be most happy to answer any questions you might have.

Signature of investigator

Date

Subject's statement

"The study described above has been explained to me. I voluntarily consent to participate in this activity. I have had an opportunity to ask questions. I understand that future questions I may have about the research or about my rights as a subject will be answered by the researcher listed above."

Name of student

Classroom teacher

Signature of parent or legal guardian

Date

APPENDIX C

Music Achievement Test

Assessment Form

Please Note

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

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APPENDIX D

Demographic Data Questionnaire

MUSIC QUESTIONNAIRE

Student Number _____

1. Do you participate in any outside of school music activities? (for example, community or church choir, drum & bugle corps, etc.)

YES _____

NO _____

If yes, what kind? _____

2. Do you play piano?

YES _____

NO _____

If yes, how many years have you taken lessons? _____

3. Do you play any other musical instrument (besides piano) that is not taught in school?

YES _____

NO _____

If yes, what kind do you play? _____

4. Are either of your parents actively involved in music?

YES _____

NO _____

If yes, in what groups? _____

5. Did either of your parents graduate from college?

YES _____

NO _____

Vita for

David M. Holmes

EDUCATION

Doctor of Philosophy in Music Education; University of Washington (May, 1995).
Areas of emphasis are music education, wind conducting, and trombone performance.

Master of Music Education; Western Oregon State College, 1980.

Bachelor of Science in Music Education; Western Oregon State College, 1974.

TEACHING EXPERIENCE

1992-1993 - Adjunct Assistant Professor, University of Washington, EdC&I 319,
"Incorporating Music in the Elementary Classroom";

1987-present - Instrumental Music, grades 5-12, Bellevue School District,
Bellevue, WA, (including development of a MIDI-based music theory class
for Bellevue HS).

1977-1987 - Instrumental Music, Silverton Union High School, grades 9-12,
Silverton, OR.

1974-1977 - Instrumental Music, Dayton School District, grades 6-12, Dayton,
OR.