

A CORRELATION OF MUSIC APTITUDE
AND LANGUAGE READING

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A CORRELATION OF MUSIC APTITUDE
AND LANGUAGE READING

May, 1986

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The purpose of this study was to investigate possible relationships between music aptitude and language reading. Two standardized tests were administered to second-grade children: Primary Measures of Music Audiation and California Achievement Test. Two schools, public and private, were used in the population. High and low second-grade groups showed a significant correlation with reading scores at .01 level when scores were rank ordered according to music aptitude. The variable which showed the greatest predictive ability with music aptitude, at .05 level, was comprehension. There was no significant difference between girls' and boys' performance on music aptitude tests. Girls in private school had the highest mean reading total. Students of private school had a significantly higher mean reading total than students of public school. Results of this research contain implications for further study with a broader sample, treatment effect, and a more precise instrument to measure reading achievement.

DEDICATION

To my husband, Eugene, for his endless patience and encouragement.

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A CORRELATION OF MUSIC APTITUDE AND LANGUAGE READING

CHAPTER I

INTRODUCTION

Research, discussions, and class observations suggest that music aptitude might have a positive and significant correlation with language reading. Maze (1967) states, "Reading success seems to be affected by a pattern ability, or melodic language pattern facility of the individual student" (p. 28). Another author has challenged this position saying, "We are on uncertain ground when we rely solely on testimonials about the supposedly meritorious effect of music activities on children's reading" (Groff, 1977, p. 39.)

Purpose

The purpose of this study was to investigate the possible relationship between musical aptitude and language reading achievement. This research might aid in clarifying conjecture and opinion that has persisted for thirty years. The focus of this investigation was to compare the performance of second-grade children on a standardized music aptitude test and a standardized reading achievement test. Since language expression and its components comprise reading readiness activities which were similar to those

found in the development of tonal memory and rhythm in music this study investigated the common activities that music and language reading might share.

Justification

Dykstra (1966) found in his research that auditory discrimination ability as a predictor to successful reading achievement deserved only cursory attention because he found low correlation between reading readiness subtests and a primary reading test. Fundamentals of teaching reading have changed since the Dykstra study was made. Currently, early childhood specialists maintain that experiences with language (hearing and speaking) are a prerequisite to reading achievement (Gillet & Temple, 1982). Norton (1980) found that music aptitude was a factor in predicting auditory conservation performance. It was noted by the researcher that piano teachers were experiencing language reading problems with young children learning to play the piano. Often children could not read well enough to understand the piano method books' instructions to complete an assignment. On one occasion it was advantageous for a teacher to teach language reading along with piano pedagogical techniques in order for a young child to succeed in learning the piano. This teacher observed that some of the readiness concepts used in piano

or different). This teacher began to question if the two disciplines might be related. More research is needed to identify relationships between music aptitude and language reading achievement to aid in instruction of young children.

Hypothesis

Relationships between the standardized music aptitude test scores and the standardized reading and language achievement test scores of second-grade children is the general question posed by this study. From this question there are there are four specific hypotheses:

- H 1: There is no difference between the musical aptitude and language reading achievement of second-grade students.
- H 2: Girls and boys show no difference in correlations between music aptitude tests and language reading tests.
- H 3: There is no difference between tonal and rhythm subtests and reading achievement subtests.
- H 4: There is no difference between the achievement of students in public or private schools on music aptitude tests and language reading tests.

Procedure

Two standardized tests were administered to second-grade children. The Primary Measures of Music Audiation (Gordon, 1979) had two subtests, tonal and rhythm, each requiring about twenty minutes to administer. The California-Achievement Test (CAT) (1977) had nine subtests in all. Four subtests were related to reading: phonic analysis, structural analysis, reading vocabulary and reading comprehension. Three subtests were concerned with language expression (choice of words). The remaining subtests measured mathematics. The Multiple Regression Prediction Equation and Hotelling's T^2 for correlated samples were used to calculate the correlation between the language scores and the music aptitude scores to determine whether music aptitude and reading achievement were related. Other statistical procedures (ANOVA and MANOVA) were employed to compare the mean score differences.

Definition of Terms

The following terms are defined as they are used in this study:

Music Aptitude. In this study music aptitude is the product of "...nature and nurture; both contribute in unknown proportions to one's music aptitude" (Gordon, 1979, p. 4).

Music Audiation. Music audiation is the ability to hear

and recall music. In order to perceive and conceive music aurally, for referential and comparative purposes, one must audiate music heard at a previous time (Gordon, 1979).

Musicality. Musicality is defined as the "...sensitivity to, knowledge of, or talent for music" (Maze, 1967, p. 13).

Reading Achievement. Reading achievement is the performance of certain reading skills, to a minimal competence, as measured by a standardized reading achievement test.

ORGANIZATION OF THE STUDY

Chapter I of this study stated the purpose and problem of research, defined terms used in the body of the study and explained the justification of the study. Chapter II reviews the related literature on the selected topic. Chapter III outlines the design of the study and the procedures to be used. Chapter IV consists of the analysis of the data obtained. Chapter V is a summary of the findings, implications, and recommendations for future research.

CHAPTER II

RELATED LITERATURE

Music activities (listening, performing, or writing) have appeared to educators and researchers to be related to the acquisition of language reading. They have been paired often and in diverse ways. Authentic research, discussions of new ideas, and class observations have revealed a wealth of literature on the apparent, or not so apparent relationship, depending on the vantage point. The literature concerning music and language reading falls into three general categories: research, discussions, and class observations.

Research in the field of music reading and/or musicality and its parallel to language reading has been approached from many viewpoints. Interest in this area has ranged from music reading and language reading to auditory discrimination skills, improvement of music education, transfer of skills from one area to another, to combining the two fields to aid the slow or disabled learner.

Combining factors of previous research, Maze (1976) considered the relationship between native musical ability and reading achievement with first-grade children. The Seashore Measures of Musical Talents was used, but it was adapted for first-grade children by Maze and it was assumed

to be valid. Reading achievement scores were derived from the Metropolitan Achievement Test. The correlations between subtests of musicality and reading achievement reached high levels of significance, with most reaching the .01 level.

The relationship of teaching specific music reading skills and learning basic reading skills in the primary grades was investigated by Movsesian (1967). He hoped to find a significant transfer of music skills to reading vocabulary and reading comprehension, as well as eliminating oral reading errors. He used three tests: the California Achievement Test, the Gray Oral Reading Test, and the Survey of Primary Music Reading Development. The experimental groups made gains more than the control groups in all three primary grades (Movsesian, 1967). The findings revealed that children in the first-grade experimental group made very significant gains in reading vocabulary and reading comprehension. His treatment method used 12 songs on charts of two- and three-part songs, resonator bells, lines and spaces of the staff, and attention given to symbols of the staff. The method developed left-to-right orientation, spatial perception relationship, and refinement of visual motor coordination (Movsesian, 1967).

Two researchers considered specific ways music could aid

the child with special needs. The results of Nicholson's (1972) study indicated that music could improve the ability of the slow learner in discrimination of paired groups of letters that gave difficulty because of similarity.

Mallock (1974) developed a program called Say It With Music to help children in her special education classes.

Significant improvement was noted in expressive language ability, grammatical accuracy, ideas expressed in longer units, and verbalization of experiences.

In considering music aptitude, I.Q., and auditory conservation Norton (1980) found that the results of the study indicated that music aptitude was a prominent factor in predicting auditory conservation performance, and that the interaction of I.Q. and music aptitude was predictive of auditory conservation task performance. Since the results of the study showed the significance of intelligence (I.Q.) in the performance of music tasks, it seemed reasonable to recommend cognitive development through the inclusion of music task solving as a part of the general curriculum for the young child.

Research in the fifties established a foundation of correlating music and language reading. A low positive relationship was found by Wheeler and Wheeler (1952) between music reading and language reading. Since the

correlations were not high enough to make predictions such as a good music reader would necessarily be a good language reader or vice versa, they could only suggest that more research be done. They did find no apparent male and female differences in music reading ability. They reported that pupils taking private music lessons were able to read music better, but the difference was smaller than might be expected, and the ability to read language was more closely related to intelligence than to the ability to read music.

The implications of Dykstra's research indicated that more experimental studies were needed comparing groups receiving instruction directed at improving auditory discrimination. He found that girls were significantly superior to boys in auditory discrimination skills, and girls were superior in reading achievement after a year of instruction (Dykstra, 1966).

In seeking to clarify the process of teaching music reading, Monroe (1967) investigated the aspects of the teaching of language reading as it related to the music reading process. This study considered six areas: a) outstanding features in both reading programs, b) a suggested growth sequence in music reading, c) musical experiences involving music reading in elementary grades, d) identification of how language reading might be useful

in music reading, e) purposes of music education, and f) a sequenced music reading program for the elementary grades. The implications were that the classroom teacher and music specialist could communicate joint teaching goals by increased knowledge of the parallels in both fields of reading.

Michael Gordon (1977) examined two related problem areas in reading instruction and music performance. First, he considered if contingent music instruction acted as reinforcement for reading behavior in the classroom and second, he considered what effect contingent music instruction could have on music performance achievement. The experimental group's performance increased and declined as the reinforcement of music instruction was withdrawn or returned accordingly. Thus, the motivational value of music was established. The results of the study suggested that instrumental music (or any other music) could be used as a powerful force in the daily lives of children; however, the implication that music must be used as a reinforcer could not be supported.

Lauder (1976) conducted a study examining the effect of music activities upon reading achievement at the first-grade level. Both control groups and the experimental groups received a special treatment including a) music

exercises correlated to reading texts, b) activities developed by reading specialists to relate music to reading, c) activities taken from the music text, and d) general interest activities. The results showed only one area nearing the .05 level of significance. That area dealt with identification of initial consonants and vowels of words read aloud (pretest) and identification of letter sounds (a particular letter made a particular sound) when a word was read aloud (posttest).

In reviewing the research literature on music and language reading, Sullivan stated that there appeared to be a positive correlation between factors of music ability and language reading ability (Sullivan, 1979). The findings thus far did not support the use of music instruction for purposes of improving language reading. However, Sullivan pointed out that studies involving music instruction did not use song materials for reading materials, rather music reading as a technique for language reading improvement was attempted.

Educators and researchers have concluded at long last that research of the young student should be given highest priority (Webb, 1985). She updated the review of research in music education, pointing out Gordon's research of 1980 which concluded that musical aptitude was developing until

about the age of nine. Another researcher in 1982 compared musical development to physical and psychological development. Based on earlier research suggesting that musical ability was the result of an interaction between intelligence and environmental stimulation, Webb concluded that musical ability might not evince unless environmental stimuli were present, which agreed with Mursell's theory (1937) that all children needed musical experiences. Webb's investigation was designed to determine if there was a linear relationship between musical aptitude test scores and intelligence test scores of children at the third grade level. The results showed a positive correlation (+.37) between I.Q. test scores and musical aptitude test scores for the third-grade. The implications were that music educators might expect musical aptitude to vary positively with I.Q. and plan objectives and activities accordingly (Webb, 1985).

In planning and strategizing, educators often sought predictors that would aid them. Earlier studies suggested that academic achievement and intelligence were important predictors of successful performance of elementary instrumental music (Hedden, 1982). Hedden was looking for a set of variables to predict music achievement in general music classes. His research included academic achievement,

attitude toward music, self-concept in music, music background, and gender as predictors. The results of the investigation clearly indicated that academic achievement was the best single predictor of music achievement.

Discussions of the effective use of music as a tool, aid, and/or method of teaching one or many aspects of reading have often arisen from the ranks of music educators and classroom teachers. Patrick Groff (1977) reviewed seven prominent opinions on the subject of the relationship of music and language reading, pointing to the weaknesses or flaws of the research that achieved a positive and significant correlation in the two fields of study. His conclusions warned language teachers to be prudent in using musical activities in language reading instruction, stating that the likelihood of music activities teaching children to read was a premise that could not be accepted (Groff, 1976).

McDonald, using the same research findings, concluded that music could be useful in the development of auditory discrimination skills (letter sounds, syllabication and pronunciation of word, vocabulary expansion), expansion of oral skills (broadening of context meaning, creative experiences with phrase and sentence structure, introduction to grammar) and the acquisition of visual skills (recogni-

tion of differentiation of letters and introduction to writing) (McDonald, 1974). McDonald pointed to research conducted by Friss concerning the achievements of Hungarian children involved in the Kodaly method of music instruction, who were statistically superior to control groups in all other subject areas. To the specifics of the parallel in music learning and language learning, McDonald reported that music gave opportunity for careful listening drill (to learn a song) and repetitive pronunciation drill (singing experience) needed for reading readiness and reading mastery (McDonald, 1974). Oral skills needed before children undertake the complex task of reading should be expanded to include singing activities using a variety of words and meanings. Folk literature as language experiences has been the bread and butter of music instruction, noting that few folk tales have not been set to music (McDonald, 1974).

Lloyd (1978), a reading specialist, stated from first hand experiences (field research) that the tasks of learning music and learning language reading closely paralleled one another. Both endeavors depended on one being able to perceive likenesses and differences in sounds and in shapes of symbols. Lloyd continued by stating that young children needed the opportunity to develop auditory

and visual skills by methods not overtly identified as drill and practice, and she believed music was the ideal medium.

Many senses and clues must be called into play for the learning of reading language to occur (Gillet and Temple, 1982). Teachers, researchers and methodologists have sought many devices, strategies, and methods to enable just one more person to unlock the puzzle of written language. Yaakob (1973) stated that musical skills for teaching simple melodies emphasized similar reading readiness skills such as auditory discrimination, visual discrimination, direction imitation, interpretation, voice expressions and listening. As a classroom teacher and reading specialist, Yaakob described in detail how she used music as an effective medium for teaching reading skills.

Benthul (1981) noted that music offered practice in and motivation for reading. Even for the youngest child readiness skills could begin via rhythm bands working with accent, pause, stress, movement, and patterns. These musical activities could provide meaningful usage of language, sequencing of events, communicating both thoughts and feelings through folk song stories. Fluency, a problem of older non-reading youngsters, could be approached using choral reading and singing. He concluded with the idea that the arts certainly did more than facilitate language

reading, rather they fostered literacy of the spirit (Benthul, 1981).

Uhl (1979) maintained that teaching of singing was an extension of auditory acuity, noting that rote singing required the same concentration as learning spoken language. Auditory perception skills outranked all other factors in its contribution to successful reading, certainly in programs stressing phonics instruction (Harris & Sipay, 1980).

The "musical cloze" process was developed by John Mateja (1982), a strategy designed to increase students' language abilities. This was a strategy developed with its roots in reading cloze procedure, language expansion, vocabulary development, and music instruction. The three-step format called for students to listen to a tape (singing along), while following words on the chalkboard as they sang the second time, and then engaging in skill activities with words. At this point words were deleted in the song text and the class would provide suggestions for the blanks. Students following this process made considerable gain in a few months (Mateja, 1982).

Zinar (1976), reviewing research done in the field of music and language reading, concluded that music with such a multisensory approach involving movement of eye, ear, and

body, accounted for the successes achieved correlating the two fields.

Compiling a two hundred entried bibliography on listening and reading involved comprehension, interpretation, and evaluation. Instruction in listening skills that were similar in nature to pre-reading skills might be extremely effective in improving reading readiness (Duker, 1965).

Reading specialists, classroom teachers, educators, and music specialists continued returning to auditory discrimination and its importance to the acquisition of reading skills. Seymour (1970) reported that auditory perception was different from hearing or perceiving language. Children entered school having the facility of perceiving language. The aim of their teacher was to help them discover that there were symbols for that language and that each sound comprising language could be isolated and symbolized. She continued by naming five essential steps a child must understand prior to reading: a) what "first" meant, b) what "sound" meant, c) what "the first sound" meant, d) that words could be groups of "sounds", and e) that (in English) the initiating sound of ball, book, and boy sound the same (Seymour, 1970). Children must be taught an awareness of sounds in their speech experiences

already learned. Teachers must learn to be more precise in describing what they are instructing, i.e., phonemic perception, sound-symbol association, and symbol-sound association (Seymour, 1970).

Speech and song can be blended together to enrich learning in almost all academic areas. Familiar sounds, rhyming sounds, and commonly used phrases in songs and rhymes have aided children as they begin to read, (later referred to as speech to print materials) (Kuhmerker, 1969). Music was the vehicle used to achieve this kinesthetic approach. Drill and practice needed for fluency in language reading has been accomplished via music with less stress on teachers and learners alike (Kuhmerker, 1969). Musicians have long been aware of the necessity of isolating sounds when learning the correct symbol for that sound, and then putting the individual sound back together to make a whole composition. Educators, realizing how valuable music skills and activities could be, have proposed that music be included in the structure of early childhood educational processes. An appropriate kindergarten reading program would include the specific use of music, rhythms, rhymes, movements, singing games, and listening activities as a part of a well structured readiness program for young children (Black, Puckett, Haws,

Moberg, and Vernon, 1985).

Class observations, rich in firsthand experiences and creativity, admittedly lack the control of variables. These observations often possess inaccurate measurement practices and offer opportunity of subtlety of practice to the educator.

A recent classroom reading program was divided into three areas: word identification, vocabulary, and comprehension. Word identification referred to ways readers decoded unfamiliar words; structural analysis (prefixes, suffixes); contextual analysis (sentence structure and meaning); and phonics (analyzing letter-sound patterns) (Smith, 1984). Vocabulary instruction involved "sight words" and meaning which was contingent upon background knowledge and concepts. Comprehension instruction helped readers organize their thoughts and relate what they knew to the new information. Four activities in the music realm related directly to this reading program: a) familiar song lyrics used as reading texts, allowed the reader to focus attention on word identification skills, e.g., circle all words that end in "silent e"; b) a deck of flash cards from song lyrics for drill and practice, increased sight vocabulary, and original sentences formed from lyrics flashcards; c)

language experience stories dictated by children from ideas of favorite folk songs, later developing "language experience songs" to familiar tunes, e.g., "Jingle Bells" tune written to a text about service stations; d) song lyrics used in the cloze procedure (fill in the missing word) to aid vocabulary and comprehension (Smith, 1984).

The area of remedial reading at the secondary level has proven to be a demanding task, requiring innovative methods. Wulffson (1970) reported one of the more successful methods involved popular music and lyrics. The music provided the motivation for the student with the teacher providing the song lyric sheets to be read as the record was played, being an instant correctional tool. This was preceded or followed by various support activities such as writing, discussion and even drawing. The importance of this activity was that the student could identify words correctly with the aid of the record. Any activity to be effective had to be successful and if enjoyable, proved to be more productive (Wulffson, 1970).

Modern educators faced with limited sources of funding have seriously given attention to the interdisciplinary approach to learning. Music specialists have devised ways to use music to reinforce and enhance all areas of learning. Reeves (1978) described a series of suggestions

in areas that music could aid basic listening and language skills for preschool and early elementary levels: auditory discrimination, auditory concept development, oral language, language experience, and phonics (Reeves, 1978).

This interdisciplinary learning approach carried music into the social studies field. A series of lessons using the folk song for social studies and the accompanying reading skills needed to ingest information of history was described by Ritt (1974). Four kinds of reading rates were developed: skimming, cursory, study and critical. The lessons were focused around the introduction of the Civil War using the song "I'm A Good Old Rebel."

Ramsey's program (1980) about learning through the arts was another example of interdisciplinary approach to education. The first step was to develop a wide range of art experiences for all children, followed by in-service training for teachers to help them infuse art into their subject areas. After securing the support of the board of education, the teachers established teams and then involved the community art groups. The two important aspects of the program were museum-related studies and an arts internship whereby art education students practice-taught at the school where the program was initiated. In addition to these aspects, a wide variety of events were presented during the

year, such as professional plays, dance workshops, puppeteers, folk singers, jazz ensembles, and holiday productions involving many artisans (Ramsey, 1980).

The probable relationship of music language reading was turned into a tool music educators could use to teach successful reading of traditional notation (Debban, 1977). The learning was concretized by using sticks, drums, and triangles to represent short, long, and longest held words. The children then decided which words were appropriate for the words of the song. They continued on with these readiness exercises until mid-year when they were introduced to notes of the song moving from left to right, up and down according to the melody. The visual-aural link came when someone would notice that the melody would go lower if the sixth note card were placed before the fifth. Using the cards with notes students displayed known melodies and made new creations too. Readiness activities patterned after language readiness activities worked well in teaching the class to read music (Debban, 1977).

The learning disabled have manifested skill deficiencies in processing aural sounds that relate to sight symbols. Kranyik reported that music helped with learning to differentiate sounds, a prerequisite for reading. Teachers of the learning disabled have needed a variety of activities

and strategies for remediation. One problem using musical activities has been reluctant teachers who question their ability to sing adequately. Kranyik listed three activities that anyone could use: a) play 10 pairs of notes on a piano, spaced apart enough to allow children to detect the difference, playing one pair on the same pitch, then asking the children to identify if the second note were the same or different; b) playing paired tones, asking the children if the second two were higher or lower; c) later, adding the choice of "same" (Kranyik, 1970).

Another application of the interdisciplinary approach was used in classes combining reading and music. Volkmann (1974) related how children's literature could be enhanced and comprehension of poetry improved by using dynamics and rhythms in choral reading activities, using markings commonly found in music (ff fortissimo - very loud, or rit. ritardando - slowing of tempo) to aid interpretation and understanding. The next logical step after reading the poem chorally was to set it to a tune created by the children.

Following this approach to reading and music, Olson and Fite (1985) recently have proposed a rationale and criteria for music and reading activities. The music teacher is concerned with the appreciation and knowledge of music,

while the reading teacher has to focus on the mastery of basic reading skills and fluent reading. Together they could enhance both areas so important to the development of the entire person. The criteria for the music teacher to follow in making music activities compatible with the reading were the following: a) the activity should be supportive of the reading teacher's goals (word recognition and comprehension as well as fluency), b) the activity should be motivating and interesting for the students, and c) the activity should provide learning experiences that both enrich and increase students' music knowledge and sensitivity. Using such guidelines, music teachers and reading teachers collaborate to integrate music with reading for the benefit of the children (Olson & Fite, 1985).

Bentley (1985) in his study of music and language reading, organized a review of the literature under the topics reading readiness, levels of achievement, and remediation.

Regularly, specialists in music and language reading find new ways of pairing music with language reading to aid the children they teach. Theorists try to evaluate the worth of these new modes of learning. Research studies follow to validate the theories.

CHAPTER III

DESIGN AND PROCEDURES OF THE STUDY

This study was designed to determine relationships between musical aptitude and reading achievement of second-grade children. The following hypotheses were considered:

- H 1: There is no difference between the musical aptitude and language reading achievement of second-grade students.
- H 2: Girls and boys show no difference in correlations between music aptitude tests and language reading tests.
- H 3: There is no difference between tonal and rhythm subtests and reading achievement subtests.
- H 4: There is no difference between the achievement of students in public or private schools on music aptitude tests and language reading tests.

Plan of Study

This study examined the musical abilities of second-grade children enrolled in private and public schools of northeast Tarrant County and southern Denton County, respectively, in correlation to their individual reading achievement.

The Primary Measures of Music Audiation (PMMA) by Edwin E. Gordon (1979) was used to measure the musical abilities of the children. The test was designed to measure the musical potential in children from kindergarten through the third grade. It was composed of two parts, Tonal and Rhythm, which concentrated on audile perception to evaluate the musical potential. The listeners responded to what they heard on the tape as being same or different. Each test had 40 questions, with the child circling a choice (same or different faces) on an answer sheet.

The California Achievement Test (CAT), level 12c, reading, spelling, and language sections, was used to measure the reading and language achievement at both schools, public and private. The CAT reading and language subtests served as a short standardized survey test of general reading and language achievement. The first seven sections were administered: Phonic Analysis (beginning and ending consonant sounds and vowel sounds), Structural Analysis (word combinations to make new word, contractions' meanings, prefixes, suffixes, and base words), Reading Vocabulary (same and opposite meanings), Reading Comprehension (passages and questions), Spelling (right or wrong choice of underlined word), Language Mechanics (capitalization and punctuation) and Language Expression (best choice of words to complete

sentence).

Subjects

The subjects of this study were second-grade students at two different schools, one public and one private. There were four second-grade sections at the public school in southern Denton County, numbering 74 in all. There were two sections of second graders at the private school in northeast Tarrant County, numbering 24 for both sections. The children in these schools came from varying socio-economic backgrounds within each school. The private and public school populations ranged from lower economic strata to affluent.

There were 98 children in the sample of both schools. The identity of the children was coded with a control number for protection of privacy.

Sources of Data

The principals in both schools wrote letters of permission for the researcher to conduct the study using their second-grade population. All the tests were administered in the spring semester. All music tests were administered by the researcher with the permission of both schools administrators. The CAT was administered by

classroom teachers at the private school. The researcher administered the CAT at the public school.

Procedure

The PMMA was given to the children within the structure of their general music classroom. The researcher administered these tests and followed the directions and timing procedures exactly. The specific directions for this test were very simple and clear. The instruction manual was designed to accommodate the young child's understanding. It systematically prepared the child to listen to two parts of a song (short phrases) and then to decide if the two parts were the same or different. There was practice with this procedure before asking the children to circle the faces indicating their choice of same or different. As the children proceeded with the instructions, they were given time to become acquainted with the picture faces that were both smiling to indicate same, and the smiling and frowning faces to indicate different. After a thorough introduction was given, the researcher administered the Tonal Test during one class day. On the following class day the Rhythm Test was given.

The small number (19 maximum) of children taking the test allowed the researcher to monitor carefully any

problems occurring. This setting followed the guideline of the test manual. The answer sheet had each child's name clearly written on it prior to the test. Extra pencils were provided. A quality tape recorder was used so that everyone was able to hear the recording adequately. The children were spaced apart in the room or portable carrels were used to prevent a child from seeing his classmate's answer sheet.

The CAT was given with the same strict adherence to directions as the music test. The CAT testing in the private school was administered by the classroom teacher in a three day testing schedule. The public school CAT tests were administered by the researcher in a three day testing schedule, with additional days for testing those students who had been ill.

Analysis

The data from music test scores will be rank ordered, then divided into three groups, high, medium and low. These groups will represent the ability groups as they relate to reading achievement as measured by the subtests of the CAT.

Summary

The purpose of this study was a) to determine if there were a significant relationship between the musical aptitude and reading achievement of second-grade children,

aptitude test and reading achievement test were greater for girls than for boys, or vice versa, c) to determine if the correlation between the Tonal or Rhythm tests were more significantly related to any of the reading and language subtests, and d) to determine if students in the private school had more significant correlations between musical aptitude and reading achievement than students in the public school, or vice versa.

Scores from the PMMA were obtained from student answer sheets and percentile ranks assigned from the norms available in the PMMA manual. Scores from the reading, spelling and language sections of the CAT were obtained and similarly tabulated and ranked.

CHAPTER IV

ANALYSIS OF THE DATA

The hypothesis of this study as stated in Chapter I was that there would be no significant difference between the standardized music aptitude test scores and the standardized reading and language achievement test scores of the second-grade children. This hypothesis was tested on the second-grade pupils in Tarrant and Denton Counties of north central Texas, one group from a private school and one group from a public school. Four specific hypotheses considered the overall hypothesis of this study. These hypotheses were stated in Chapter III.

The first hypothesis considered the high degree and low degree of music aptitude as related to reading achievement. The raw scores of the PMMA were divided into three groups (raw scores 32 to 65 were the bottom 33.7%, raw scores 66 to 70 were the middle 32.1%, and raw scores 71 to 77 were the top 34.5%). Using the top third group and the bottom third group the coefficient of correlations were calculated with the Hotelling's T^2 formula. It was significant at .015 (See Table 1).

TABLE 1

Differences on Single Variables *				
Low and High Groups Comparison +				
of means on the CAT				
Dependent variable	Lower third group's mean	Upper third group's mean	Univariate	P value
Reading Total	50.73	59.53	-2.95	.005*#
Spelling Total	16.00	18.97	-2.07	.04*#
Language Total	29.67	34.38	-2.70	.01*#

²
*Hotellings' T = 11.79

+Groups used PMMA scores for determining high and low aptitude

#Denotes statistical significance

Univariate T's were computed on each variable and all were significant at .05 level. Table 1 showed the comparison of the two groups of students on the dependent variables, reading, spelling and language totals after adjustments were made for possible correlations among dependent variables and for the fact that more than one dependent variable was involved. The null hypothesis being tested was that the two

groups would have the same population means for music aptitude as the two groups would have for the dependent variables, reading, spelling and language totals. The mean scores for each group on reading, spelling and language were 50.73, 16.00, and 29.67, respectively, for the low group, and 59.53, 18.97, and 34.38, respectively, for the high group. Hypothesis 1 was rejected.

Hypothesis 2 considered the performance of boys and girls (sex) and music mean scores (tonal and rhythm) as independent variables when considering the dependent variables reading totals, spelling totals, and language totals. Tables 2, 3, 4 and 5 considered the multivariate and univariate analysis of variance of hypothesis 2.

A two-way multivariate (MANOVA) procedure was used to analyze the data, using sex and music as the independent variables and reading totals, spelling totals and language totals as the dependent variables (Table 2). The results indicate that there was a multivariate effect (meaning significance level) attributable to the sex condition ($F = 2.42$, $p. < .0716$), while the multivariate difference for music scores and sex condition ($F_s = 1.42$, and 0.22 , $p. < .2169$ and $.9699$, respectively) were of no significant difference.

TABLE 2

Multivariate Analysis of Variance
Summary Table

The results of all three dependent variables (reading, spelling, and language totals), using sex and music aptitude as independent variables, including interaction of the two.

Factor	F	P value
Sex	2.42	.0716*
Music	1.40	.2169
Sex & Music	.22	.9699

*Denotes statistical significance

A one-way analysis of variance (ANOVA) was used to compare the group using sex as independent variable (Table 3) in terms of the mean scores of reading totals, spelling totals, and language totals. The F value was larger than the critical value on the language total ($F = 4.78$, $p. < .0313$) indicating a significant difference between boys and girls on language totals. The F value was not larger than the critical value on the reading and spelling totals ($F_s = 1.25$, $p. < .2672$; $F_{ss} = .43$, $p. < .5149$) indicating the boys and girls did not differ significantly from one another.

TABLE 3

ANOVA Summary Table for comparing reading, spelling, and language totals using sex as the independent variable.

Factor	F	P value
Sex		
Reading	1.25	.2672
Spelling	.43	.5149
Language	4.78	.0313*

*Denotes statistical significance

Again, the one-way analysis of variance (ANOVA) was used to compute the group using music scores as the independent variable (Table 4) in terms of mean scores of reading, spelling and language totals. The F value was smaller than the critical value on the reading, spelling and language totals ($F = 2.46$, $p. < .0722$; $F_s = 2.45$, $p. < .0920$; $F_{ss} = 2.46$, $p. < .0910$) indicating no significant difference in group using music scores as the independent variable.

TABLE 4

ANOVA analysis using Music scores as independent variables, using reading, spelling, and language totals as dependent variables.

Factor	F	P value
Music Aptitude		
Reading	2.71	.0722
Spelling	2.45	.0920
Language	2.46	.0910

Using the one-way analysis of variance (ANOVA) to compute the interaction of sex and music scores (Table 5) in terms of mean scores of reading, spelling and language totals, the F value was smaller than the critical value on the reading, spelling and language totals ($F = .45$, $p. < .6399$; $F_s = .08$, $p. < .9241$; $F_{ss} = .14$, $p. < .8686$). There was no significant difference in the group using sex and music scores as the independent variables in terms of reading, spelling and language mean scores. Hypothesis 2 was accepted.

TABLE 5

ANOVA analysis showing interaction of sex and music as independent variables, with reading, spelling and language totals as dependent variables.

Factor	F	P value
Sex & Music Aptitude		
Reading	.45	.6399
Spelling	.08	.9241
Language	.14	.8686

Hypothesis 3, considered how the tonal test and the rhythm test were related to all parts of reading achievement (Table 6). The data in Table 6 presents the dependent variables rank ordered by level of significance. The data results of the raw scores of the phonics, structural analysis, vocabulary, comprehension, spelling and language mechanics and expression were computed in a Stepwise Multiple Correlation using the music tonal raw scores as the criterion. The only variable that entered the equation as a significant predictor was comprehension raw score ($R = .2556$, $p. < .05$).

TABLE 6

STEPWISE MULTIPLE CORRELATION	
Tonal Raw Scores and Rhythm Raw Scores as Criterion	

Tonal Raw Score	
<u>Variable:</u>	<u>Correlation:</u>
Comprehension Rs	.2556*
Phonics RS	.2313
Lang. Ex.Rs	.1760
Spelling Rs	.1558
Structural Ana.Rs	.1536
Lang. Mech. Rs	.1201
Vocab. Rs	.1119
*R-square value .0556	

Rhythm Raw Score	
<u>Variable:</u>	<u>Correlation:</u>
Comprehension Rs	.2171*
Phonic Rs	.1809
Lang. Ex. Rs	.1533
Lang. Mech. Rs	.1235
Spelling Rs	.1196
Structural Ana. Rs	.1086
Vocab. Rs.	.0952
*R-square value .0372	

The same reading, spelling and language raw score variables were computed in a Stepwise Multiple Correlation using the music rhythm raw scores as the criterion. Again, the only variable that entered the equation as a significant

predictor was the comprehension raw score ($R = .2171$, $p. < .05$). The multiple correlation coefficients were relatively low ($R = .2556$ [tonal] and $R = .2171$ [rhythm]) and the $R^2 = .0653$, or about 6% of the variance, was shared. Using the prediction equation $Y = 31.57 + .21 X$ and having the comprehension total one could predict the tonal and rhythm scores. The reverse was also true, but with a different equation. This variance would be shared only 6% of the time, a relatively low incidence. Hypothesis 3 was rejected.

Hypothesis 4 looked at the performance of students of a private school and a public school considering school, sex and music as independent variables when considering the dependent variables of reading, spelling and language totals. Tables 7, 8, 9 and 10 presented the results of the data on hypothesis 4.

A multivariate (MANOVA) procedure was used to analyze the data, using sex and school as independent variables, and reading, spelling and language totals as dependent variables (Table 7). The results indicated that there was no significant multivariate effect attributable to sex, school or the interaction between sex and school ($F = 1.93$, $p. < .1297$; $F_s = 1.88$, $p. < .1391$; and $F_{ss} = 0.8$, $p. < .4712$).

TABLE 7

Multivariate Summary Table using school and sex as independent variables with reading, spelling, and language totals as dependent variables.

Factor	F	P Value
Sex	1.93	.1297
School	1.88	.1391
Sex & School	.80	.4712

A one-way analysis of variance (ANOVA) was computed to compare the group using school as independent variable in terms of the mean scores of reading, spelling and language totals (Table 8). The F value was larger than the critical value on the reading totals using the school as an independent variable ($F = 4.82$, $p. < .0301$) indicating a significant difference between schools on reading totals. The F value was not larger than the critical value on spelling totals ($F = .01$, $p. < .9106$) indicating no significant difference between schools. The F value was larger than the critical value on language totals using school as an independent variable ($F = 4.14$, $p. < .0447$)

indicating there was a significant difference between schools on language totals.

A one-way analysis of variance (ANOVA) was computed to compare the group using sex as an independent variable in terms of the mean scores of reading, spelling and language totals (Table 8). The F value was larger than the critical value on the language scores ($F = 5.09$, $p. < .0264$) indicating a significant difference between boys and girls on language totals. The F value was not larger than the spelling and reading totals ($F = .00$, $p. < .9680$; $F_s = 2.11$, $p. < .1495$, respectively) indicating no significant difference between boys and girls on the spelling and reading totals.

A one-way analysis of variance (ANOVA) was used to compute the interaction of sex and school in terms of mean scores of reading, spelling and language totals (Table 8). The F value was smaller than the critical values on reading, spelling and language totals ($F = 2.14$, $p. < .1466$; $F_s = 1.05$, $p. < .3090$; $F_{ss} = 1.24$, $p. < .2690$). There was no significant difference in the group using sex and school as the independent variables in terms of reading, spelling and language mean scores.

TABLE 8

Summary Table of One-way ANOVA using school as the independent variable, with reading, spelling and language totals as dependent variables.

FACTOR	F	P value
Reading	4.85	.0301*
Spelling	0.01	.9106
Language	4.14	.0447*

Summary Table of One-way ANOVA using sex as the independent variable, with reading, spelling and language totals as dependent variables.

FACTOR	F	P value
Reading	2.11	.1495
Spelling	0.00	.9680
Language	5.09	.0264*

Summary Table of One-way ANOVA using school and sex as the independent variables, with reading, spelling and language totals as dependent variables.

FACTOR	F	P value
Reading	2.14	.1466
Spelling	1.05	.3090
Language	1.24	.2690

* Denotes statistical significance

A two-way multivariate procedure (MANOVA) was used to analyze the data, using sex and school as the independent variables in terms of tonal and rhythm totals (Table 9). The results indicated that there was no significant difference of the multivariate effect using sex and school as independent variables, or in the interaction between sex and school ($F = .02$, $p. < .9826$; $F_s = 1.50$, $p. < .2291$; $F_{ss} = .20$, $p. < .8215$, respectively).

TABLE 9

Multivariate Summary Table using sex and school as independent variables and Music Tonal and Rhythm Totals as dependent variables.

Factor	F	P value
Sex	.02	.9826
School	1.50	.2291
Sex & School	.20	.8215

A one-way analysis of variance (ANOVA) was used to compare the groups using sex as independent variable (Table 10) in terms of the mean scores of music tonal and rhythm totals. The F value was smaller than the critical value on the tonal and rhythm totals, using sex as the independent variable.

TABLE 10

A Summary Table of one-way ANOVA using sex and school as independent variables with Music Tonal and Rhythm Totals as dependent variables.

	TONAL		RHYTHM	
	F	P value	F	P value
Sex	.02	.8969	.04	.8512
School	.02	.8969	1.45	.2316
Sex & School	.39	.5342	.24	.6268

Again, a one-way analysis of variance (ANOVA) was used to compare the groups using the school as independent variable (Table 10) in terms of the mean scores of music tonal and rhythm totals. The F value was smaller than the critical value on the tonal and rhythm totals ($F = .02$, $p. < .8969$; $F_s = 1.45$, $p. < .2316$) indicating no significant difference on the tonal and rhythm totals using school as the independent variable.

Using the one-way analysis of variance (ANOVA) to compute the interaction of sex and schools (Table 10) in terms of mean scores of music tonal and rhythm totals, the F value was smaller than the critical value on music tonal and rhythm totals ($F = .39$, $p. < .5342$; $F_s = .24$, $p. < .6268$, respectively). These results indicated there was no

significant difference in the group using sex and school as independent variable in terms of music tonal and rhythm totals. Hypothesis 4 was accepted.

The cell statistics showing the raw scores of the boys' performance of reading, spelling and language totals are in Table 11 (means). The cell statistics showing the raw scores of the girls' performance of reading, spelling and language totals are in Table 12 (means). The cell scores show the performance of the two schools on reading totals. There was a significant difference between the two schools. The cell statistics show what that difference was, i.e., the private school reading score totals were significantly higher.

TABLE 11

Cell Statistics showing Males' performance on the reading, spelling, and language totals comparing private and public schools.

Males	Private School Mean	Public School Mean
Reading Total	55.38	53.11
Spelling Total	16.75	18.19
Language Total	31.25	29.56

TABLE 12

Cell Statistics showing Females' performance on the reading, spelling, and language totals comparing private and public school.

Females	Private School Mean	Public School Mean
Reading Total	64.31	53.08
Spelling Total	18.00	16.84
Language Total	34.44	31.66

Summary

The four hypotheses posed for this study were:

1. Are children with a high degree or low degree of musical aptitude comparatively proficient in language reading achievement?
2. How do girls compare to boys in correlations between music aptitude tests and language reading tests?
3. How are the tonal test and the rhythmic test correlated with reading achievement subtests?
4. Do students in public or private schools demonstrate comparable achievement on the music aptitude tests and language reading tests?

The first question indicated a significant correlation among children in the population with a high or low degree of music aptitude.

The second question indicated that no significant difference between boys' and girls' music aptitude, in comparison with reading, spelling and language achievement. There was a difference nearing significance between boys and girls in terms of reading and language achievement.

The third question identified which element (tonal or rhythm) was related to reading achievement. The results indicated that both tonal and rhythm aptitude were related significantly to comprehension. Tonal aptitude was nearing significance when correlated to phonics.

The fourth question considered performance of public school children compared to private school children in music aptitude and reading achievement. There was no significant difference in music aptitude in the comparison of the public school and private school. There was a significant difference using sex and school as the criterion, when comparing reading and language achievement. Private school children's reading and language total mean scores were higher than the Public school children's reading and language total mean scores.

CHAPTER V

IMPLICATIONS AND RECOMMENDATIONS

The purpose of this study was to investigate the possible relationship between musical aptitude and language reading achievement at the second-grade level. Secondary considerations as outlined in four questions were possible differences between male and female, public school educational experiences and private school educational experiences, and high or low degree of musical aptitude.

The overall group of the children showed no significant difference between music aptitude and reading achievement in a multiple correlation computation. The null hypothesis, no significant difference, was accepted when the mean of all children in the population was considered as one group.

Since there were levels of significance achieved when the children were grouped according to high or low music aptitude in comparison with their reading achievement, one should accept the importance music instruction could effect with the slow or disabled learner or the gifted and talented student. The middle continuum of students did not show a strong correlation between music aptitude and reading achievement. The students were divided into three groups with the top and bottom groups showing a significant

correlation at $p. < .01$. It should be noted that two groups out of the three were correlated significantly. Educators cannot dismiss that 66% of the population (when rank ordered) did show a significant correlation. Since it has been the child with problems (gifted or disabled) that perplexed the classroom teacher, one should consider music aptitude as a predictor and a tool when providing learning experiences for this 66% of the population.

The data showed that comprehension was the only variable with significant predictive ability ($R = .2556$, $p. < .05$) for both tonal and rhythm tests as the independent variable. The next variable nearing significance was phonics, which dealt with beginning and ending sounds ($R = .2313$, $p. < .04$). Comprehension could be explained as being affected by intelligence, or that good students do well in all areas, but this is not true of those in the lower intelligence spectrum. Intelligence and aptitude (artistic) are illusive and unpredictable. One cannot ignore the musical idiot savant. This evidence would suggest more research with students in the lower I.Q. range was needed as well as with the gifted and talented students.

Audiation was defined as the ability to recall sounds heard at a previous time. This was the case of the students taking the CAT, phonics section. They had to look at the

"beginning" and "ending", then decide if there were another sound similar to it in the selection list. However, not like the PMMA, no actual sounds were heard. The children had to "think" of the sounds. This study might have revealed a stronger correlation if a tape had been played using initial and ending sounds for them to hear and to identify, rather than a "mental sound" reproduction process.

There was no significant difference between public school and private school performance on the PMMA. There was no significant difference between girls and boys on the PMMA. It should be mentioned that the music specialist and music curriculum used in the two schools were the same.

There was a significant difference in reading totals when school and sex were the independent variables. The results indicated that the students in the private school achieved higher reading and language totals. Suggested reasons for this difference might include smaller class sizes, more parental involvement in the educational experiences, additional professional instruction after school or in summer, and an attitude of striving for excellence promoted by staff and parents.

There was a significant difference in the reading and language totals when sex and schools were the independent variables and reading and language totals were the dependent

variables. Girls in the private school had higher mean totals than girls and boys of the public school. Also, private school girls scored higher than the boys of the private school. This researcher observed several reasons for this finding. Parental and teacher expectations were different for girls than boys. Girls enjoyed activities related to the acquisition of language skills. The parents of private school children were much more anxious for their offspring to succeed because of the monetary factor. Support activities for learning in private schools were more accessible because of the time commitment and availability of resources in each family of the private school children.

Recommendations

Results of this research contain implications for further study with a broader sample, for a treatment effect and for more precise measuring instruments as detailed in the following recommendations.

1. A similar study should be conducted using a larger population, dividing the population into thirds based on their music aptitude.

2. A study considering the disabled learner and the gifted and talented child as the focal point, using music ability to aid and augment reading achievement, should be conducted.
3. A treatment effect should be developed using song lyrics to influence reading comprehension, phonics and language expression. This treatment effect would include an experimental group and control group using extended age groups from kindergarten through third grade.
4. A different instrument of measure for phonic analysis should be found that more closely follows the procedure used in the PMMA, which played a tonal or rhythm pattern, then followed it with an exact repetition or a slight or greater alteration in the second phrase.

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APPENDIX

TEXAS WOMAN'S UNIVERSITY
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Grad School
(Karon) indicated
The ...
on 3/4/86

HUMAN SUBJECTS REVIEW COMMITTEE

Name of Investigator: Mrs. Barbara L. Witowski Center: Denton

Address: 5716 Starling Circle Date: 2-25-86

Ft. Worth, Texas 76117

Dear Mrs. Barbara L. Witowski

Your study entitled A Correlation of Music Aptitude and
Language Reading

has been reviewed by a committee of the Human Subjects Review Committee and it appears to meet our requirements in regard to protection of the individual's rights.

Please be reminded that both the University and the Department of Health, Education, and Welfare regulations typically require that signatures indicating informed consent be obtained from all human subjects in your studies. These are to be filed with the Human Subjects Review Committee. Any exception to this requirement is noted below. Furthermore, according to DHEW regulations, another review by the Committee is required if your project changes.

Any special provisions pertaining to your study are noted below:

Add to informed consent form: No medical service or compensation is provided to subjects by the University as a result of injury from participation in research.

Add to informed consent form: I UNDERSTAND THAT THE RETURN OF MY QUESTIONNAIRE CONSTITUTES MY INFORMED CONSENT TO ACT AS A SUBJECT IN THIS RESEARCH.

The filing of signatures of subjects with the Human Subjects Review Committee is not required.

Other:

vvv No special provisions apply.

cc: Graduate School
Project Director
Director of School or
Chairman of Department

Sincerely,


Chairman, Human Subjects
Review Committee

at Denton

3/10/82