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**A comparative analysis of melodic and rhythmic music reading
skills of percussion and wind instrument students in selected
North Carolina high schools**

Wheeler, Mark Roy, Ed.D.

The University of North Carolina at Greensboro, 1992

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A COMPARATIVE ANALYSIS OF MELODIC AND RHYTHMIC MUSIC
READING SKILLS OF PERCUSSION AND WIND INSTRUMENT
STUDENTS IN SELECTED NORTH CAROLINA HIGH SCHOOLS

by

Mark R. Wheeler

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the Faculty of the Graduate School at
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Doctor of Education

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1992

Approved by


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APPROVAL PAGE

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WHEELER, MARK ROY, Ed.D. A Comparative Analysis of Melodic and Rhythmic Music Reading Skills of Percussion and Wind Instrument Students in Selected North Carolina High Schools. (1992) Directed by Dr. James W. Sherbon. 93 pp.

The purpose of this study was to determine if there were differences in melodic and rhythmic reading skills between percussion and wind instrument students in selected North Carolina band programs. Specifically, comparisons were made of the music reading skills among percussion, clarinet, and trumpet students in high school bands. A secondary research objective was to determine the effects of years of instruction, private instruction, piano instruction, and other music training or experience on the music reading skills of the students. A sample of 388 students from twelve North Carolina high school band programs served as subjects. The subjects were administered four subtests of the Colwell Music Achievement Test which measured melodic and rhythmic music reading skills directly applicable to this study.

The independent variable was instrument group (percussion, clarinet, and trumpet). The dependent variables were the scores on the four subtests of the MAT. A series of univariate analyses of variance were computed to determine significant differences between the three instrument groups. Two-way analyses of variance were computed for each of the secondary variables to determine significant effects and interactions.

Significant differences in melodic mean scores occurred between the trumpet and percussion groups, and the trumpet

and clarinet groups. There were no significant differences in rhythmic reading mean scores. Among the three instrument groups, there were significant differences in mean scores for subjects receiving from three to six years of band instruction. Private instruction on the principal instrument improved the melodic scores of the trumpet and clarinet groups, but did not contribute to the melodic scores of the percussion group. Results of the study support the speculation that percussion students may not be as well prepared in basic music reading skills when compared with trumpet students.

CHAPTER I
INTRODUCTION

Traditional band instruction from the elementary school level through high school includes the development of various music reading skills. Typically, beginning band students are grouped in heterogeneous classes and issued method books with band ensemble parts adapted to the specific instruments they are learning to play. With the books serving as a basis for instructional sequencing, students begin learning an association between printed symbols and the sounds represented by those symbols. Students learn that appropriate physical actions while playing an instrument, such as covering holes or pressing valves, produce the respective sounds represented by the symbols. The result is a conceptual link between notational symbols and musical response. The development of these associations may be translated into the ability to read music; this ability is considered basic to learning and performing music independently (Petzold, 1966). The focus of this study, therefore, was to compare the music reading skills of percussion students with those of trumpet and clarinet students.

Music Reading Skills

According to Brocklehurst (1971), music reading is a component of music literacy skills. The term music literacy implies a cultivated aural perception of notational symbols, and visualization of the associated sounds.

The ability to comprehend what is seen in notation and to visualize the notation of music that is heard are basic skills and accomplishments common to performing musicians (Dodson, 1983); this characteristic of music reading ability has been referred to as auditory-visual discrimination (Stecklein & Aliferis, 1957). According to Leonhard and House (1972), skill in reading music is determined by "awareness of tonal and rhythmic movement in music and the development of concepts of tonality, of the tendencies of chords and tones, of the meaning of notational symbols, and the relationship between the symbols and the sounds they represent" (p. 138).

Petzold (1960) describes three perceptual levels involved in the music reading process: aural perception of music sounds; visual perception of music symbols; and the integration process which organizes aural and visual perceptions for new learning situations. Aural perception takes place when one perceives music from a sound stimulus. Groups of sounds are perceived as complete melodic units, patterns, or phrases. Visual perception of music notation requires an understanding of music symbols, and visual

recognition of melodic and rhythmic patterns. Persons who possess music reading skills are able to organize melodic and rhythmic sounds that are presented aurally and visually (Petzold, 1960).

The development of music reading skills and the variance among students in music reading achievement have been a major concern of music educators since music instruction was introduced into the school curriculum (Elliott, 1982; Schneider & Cady, 1965). For example, students within and across instrumental sections of bands may master music reading skills at different rates. Two factors commonly emerge as principal causes of variance in music reading achievement rate: individual abilities and technical requirements of specific instruments.

The influence of individual learning abilities on the development of music reading skills has been well-established by researchers (Bolden, 1967; Colwell, 1963; Gordon, 1970; MacKnight, 1975; McCarthy, 1969; Petzold, 1960; Froseth, 1968); however, the influence of technical requirements of instruments on music reading skills has not been thoroughly documented. Fundamentally, instruments such as the clarinet and trumpet require students to concentrate on factors such as proper breathing and air support, embouchure and tongue placement, pressing the correct valves or covering the correct holes, and associating notation on the page with certain melodic and

rhythmic patterns. In comparison, students playing the snare drum are required to hold a pair of drum sticks, strike the drum according to a prescribed written note, and maintain correct stick height, velocity, and playing area. Further, in terms of music notation, a simple example of requirements for percussion students presented in beginning band method books shows that most exercises written for the snare drum can be performed rhythmically correct with little regard for grip, stick height, velocity, and playing area. In comparison, wind instrument students must coordinate breathing and air support, embouchure, and finger placement in order to produce a melodically or rhythmically correct sound. As observed in First Division Band Method (Weber, 1968), Belwin Elementary Band Method (Weber, 1957), and Band Today (Ployhar, 1977), the first pages of the books show lines containing whole notes, half notes, and quarter notes alternating with rests. Based on the notation offered in these method books, a percussion student does not need a music instrument to participate in the first stages of a beginning band program to develop fundamental rhythmic reading skills.

Given this comparison regarding music reading and technical factors, students playing clarinets, trumpets, and other wind instruments are presented with greater challenges than percussion students, and conditionally gain more attention from band directors than percussion students.

This situation supports the premise that some students may receive more instruction than others as a result of the perceived difficulty of the instrument they play. If students in elementary and middle school programs receive varying amounts of music instruction as they progress through early stages of instrumental instruction, those who were neglected or not provided equal instruction may possess deficiencies in music reading skills, concepts, and performance abilities when they reach the high school level of band performance.

When considering achievement levels of students in band programs, percussion players often are criticized for lack of music reading skills (McClaren, 1987). Certain factors could contribute to this criticism: 1) less attention focused on percussion players from band directors, 2) insufficient knowledge of percussion pedagogical techniques by band directors, 3) less demanding exercises in method books, and 4) lack of attention to melodic reading. Several music educators (Buehlman, 1973; Byo, 1988; Hong, 1977, 1975; Sampson, 1968) have studied percussion books, as part of heterogeneous band method series, and have reported deficiencies in content and presentation. They indicate that the snare drum parts are elementary and simple, containing quarter notes and eighth notes for a considerable portion of the book. Also, the other percussion instruments such as keyboard percussion and timpani are usually not

introduced in beginning band instruction particularly because method books do not provide material for the development of music reading skills on these instruments. In a survey of percussion texts (instruction books and sheet music), Pimentel (1977) found a severe deficiency in space devoted to tonal concepts, such as discussion of and musical examples for keyboard percussion instruments. The texts focused on snare drum instead of the development of all percussion instruments.

Percussion in the Band Program

Throughout a percussion student's school music experience, a variety of percussion instruments are encountered. These instruments form two distinct categories: indefinite pitch, which include the snare drum, bass drum, and many metallic and wooden instruments; and definite pitch, which include the xylophone, bells, chimes, marimba, and timpani.

The twentieth century may be described as the era of the percussionist (Houllif, 1983). This view has emerged from the fact that contemporary composers increasingly have searched for new modes of musical expression involving percussion instruments, and have expanded the technical demands on percussion players. Because of this trend, the repertoire for percussionists during the twentieth century has gained prominence, has become more complex and technically more demanding.

In recent years, composers of elementary and secondary school band music have included multiple percussion parts in their music resulting in an increasing number of published works containing complex and demanding parts for snare drum, bass drum, timpani, and the accessory instruments, such as triangle, tambourine, and woodblock. Expansion also has occurred in the emergence of works which require keyboard percussion instruments, such as bells, xylophone, marimba, and vibraphone. Stylistically, composers are using keyboard instruments in accompanying and in soloistic capacities (Houllif, 1983). With the expansion of music literature for all kinds of percussion instruments and the important values being placed upon keyboard percussion, there is an increased demand for percussion students who possess advanced technical skills and competencies in melodic and rhythmic music reading.

Because of these trends in music composition and the increased availability of percussion instruments, percussion students need to become proficient on keyboard percussion instruments such as bells, xylophone, and timpani. Attainment of melodic and rhythmic music reading skills is essential to acquiring proficiency on definite pitched percussion instruments. If percussion students are expected to perform at the same skill levels as other high school instrumental students, they need to know how to read melodic and rhythmic music, in order to play independently and

within an instrumental ensemble. When considering the possibility that percussion students may be subjected to inferior method books and lack of attention from directors, their achievement level may be affected by these factors, which in turn determines the extent of their music reading skills in high school bands.

Purpose of the Study

The purpose of this study was to determine if there are differences in melodic and rhythmic reading skills between percussion and wind instrument students in selected North Carolina band programs. The focus of this study was music reading achievement among students in three band sections: percussion, clarinet, and trumpet. Since the study was directed toward the investigation of advanced music reading skills that are formulated in beginning band classes, the researcher determined that clarinet and trumpet sections were most likely to provide representative and balanced numbers of students for comparison with percussion students. Results of this comparison provided data regarding possible variance of achievement among band students in melodic and rhythmic music reading skills. The study of differences between factors of music reading skills may also provide information that will reflect on the effectiveness of instructional procedures traditionally employed in band programs.

Statement of the Problem

While the issue of music reading skills has been questioned by professionals in music education, there appears to be insufficient evidence in the literature related to differences in music reading skills between high school instrumental students. There has been considerable interest in the status of percussion music education in recent years; however, there is a lack of published research in music reading comparisons between percussionists and other band students. The issues that have emerged in the present rationale increase the speculation that percussionists are not as well prepared in basic music reading skills when compared with their counterparts in other instrumental sections of bands at the high school level of performance. The following questions served as a catalyst for the critical objectives of this study in music reading skills:

Principal question:

- 1) Is there a difference in music reading skills among percussion, clarinet, and trumpet students at the high school level?

Secondary questions:

- 2) What are the effects of years of formal instruction, private instruction, piano experience, and other out-of-school music training or experiences on music reading skills among percussion, clarinet, and trumpet players at the high school level?

- 3) Are there significant interactions between the factors of instrument and years of formal instruction, private instruction, piano experience, or other out-of-school music training and experiences?

If differences in melodic and rhythmic reading skills between percussion, clarinet, and trumpet students are found as a result of this study, the identification of these differences may help determine a possible need for additional research on changes in percussion instruction in school band programs, and will help to stimulate further research in the areas of early and continued music training for percussion, clarinet, and trumpet students.

CHAPTER II

RELATED LITERATURE

The concerns and issues of music students' skills as a result of music instruction have been addressed by various researchers. The literature reviewed for this study includes the following topics: instrumental instruction at the beginning level, music reading in instrumental music programs, the content of music instruction in instrumental music programs, and various views and concepts of the current status of percussion education as it relates to instrumental music programs in general.

Beginning Instrumental Music Instruction

Many articles have been published concerning various teaching approaches at the beginning level of instrumental music instruction. Garofalo and Whaley (1979) investigated the effects of a traditional teaching method (performance-oriented approach) versus the Unit Study Composition on the development of music concepts and skills in instrumental programs. The Unit Study was a learning module that provided a systematic introduction to basic concepts such as melody, harmony, form, rhythm, and the historical context of music. The authors concluded that this module, when used as the main instructional component

in the curriculum, established an effective method for teaching music concepts and skills to instrumental music students.

Whitener (1982) studied the effects of a comprehensive musicianship approach versus a performance-oriented approach on the achievement of beginning band students. A comprehensive musicianship approach was designed by the researcher to teach the musical elements of rhythm, timbre, melody, form, and harmony. The author concluded that the introduction of a comprehensive musicianship approach enhanced the musical development of beginning band students.

Noble (1971) investigated the values of certain music concepts in teaching beginning band. His curriculum consisted of the introduction of basic concepts of band instrument performance before any skills were introduced. Noble hypothesized that a difference in musical skill development would result from using the following seven concepts: physical design of the instrument, tone production, ideal tone quality, intervallic relationships, correct note duration, rhythm, and phrasing. Noble concluded that the concept approach was superior to traditional teaching approaches (use of band text only) in the development of performance skills.

Elliott (1972) conducted a study to determine the effectiveness of singing in beginning band classes. The researcher investigated the extent to which singing the band

parts affected the sense of pitch of the students. Elliott theorized that, by singing, students would learn to associate music notation with specific sounds rather than with certain fingerings or hand positions. Students following daily singing exercises were superior to those who did not sing in pitch discrimination ability, relating musical sounds to musical notation, and mentally converting musical notation into musical sounds.

In a study of beginning fifth-grade instrumental students, Kendall (1988) investigated the introduction of music reading activities during beginning instrumental instruction and the development of better aural and instrumental performance skills with a modeling mode of instruction. Kendall's findings confirmed that music reading activities assisted student development of melodic verbal association skills (use of solfege syllables) more effectively than the modeling instruction. Kendall concluded that music reading activities contribute significantly to the development of students' melodic and rhythmic sight-reading skills.

Music Reading in Instrumental Music

Some music educators believe that there is an overemphasis on music reading in beginning instrumental music instruction, thus limiting the development of essential reading readiness skills. Andrews (1962) referred to the problem of teaching notes and musical context without

developing musicianship. Ernst (1962), Hartshorn (1963), and House (1966) expressed that instrumental students have possibly developed notation or note-reading skills without the benefit of melodic and rhythmic readiness experiences.

Delzell (1989) investigated the concept of using musical discrimination training with beginning instrumental music students. The author found that music discrimination skills can be developed with a systematic training approach that uses models, discriminator foils (variants of the models), and imitation. A moderate relationship ($r = .50$) was reported between musical discrimination skill and instrumental music performance achievement.

The process of music reading in instrumental music instruction has been addressed by various researchers. Bolden (1967), Boyle (1968), and Greer (1980) consider audiation and kinesthetic response to tonal and rhythmic patterns to be necessary readiness experiences in the development of instrumental reading and performance skills. Boyle (1968) investigated the use of physical movements in teaching rhythmic reading. He found that this type of instructional program significantly affected the rhythmic sight-reading abilities of instrumental students.

Gordon (1971) emphasized the importance of developing a vocabulary of tonal and rhythm patterns. This vocabulary contains the experiences a student needs to associate musical meaning to notation. Schleuter (1984) found that a

tonal and rhythm vocabulary helped develop instrumental techniques and music content perception of style, phrasing, harmony, and form.

MacKnight (1975) studied the concept of music reading as a process emphasizing the structure of the melodic line in the instructional process. Results of the study suggested that tonal pattern instruction is superior to note identification teaching techniques in the development of sight reading skills and auditory discrimination skills. The findings also indicated that increased musical understanding, as well as proficiency on an instrument, can be achieved when the instructional process includes identification of musical patterns, involvement in listening, singing with tonal syllables, chanting with rhythm syllables, and thought and conceptualization.

Grutzmacher (1987) investigated the relationship of tonal pattern instruction to reading recognition and melodic sight-reading achievement of beginning instrumentalists. Two courses of study were compared: one course of study emphasized tonal concept development using harmonization and vocalization as teaching techniques; the other emphasized technical skill development. The author concluded that tonal pattern instruction improved the aural perception and melodic sight-reading skills of beginning band students.

Content of Music Instruction

Many researchers investigated the effectiveness of discrimination training on the development of music concepts and skills. Music instruction that includes discrimination training has resulted in improvement of aural discrimination of instrument timbres (Froelich, 1971; Jetter, 1978); melodic and rhythmic concepts, expressive qualities and form (Norton, 1973); and concepts related to exact melodic repetition (Jetter, 1978).

Carlson (1972) conducted a study that provided data about the subject matter content incorporated into the public high school band rehearsal. One phase of his survey revealed that band directors taught the key signature, time signature, note values, and rest values most frequently when rehearsing music compositions.

Gebhardt (1973) integrated performance skills, listening skills, and analytical skills in score reading in a junior high school band program. An experimental group discussed, sang, and listened to examples of major and minor modes, and examples in duple and triple meter. The students also rehearsed arpeggios, chords, and rhythmic and technical etudes. A control group was taught with an emphasis only on performance skills. Posttests indicated significant improvement by the experimental group while the control group showed minimal improvement.

Related Literature in Percussion Education

Much of the literature concerning percussion in the school music program described typical situations and circumstances which contributed to the development of a percussion student. Sims (1986) described the problematic nature of the percussion section in school band programs, which often is a constant source of confusion to band directors. The point of entry for a student percussionist is usually a practice pad and a pair of sticks. According to Sims, the student is referred to as a "drummer" but quickly undergoes the transition to a percussionist. Instead of playing only the snare drum, the student is required to play the triangle, cymbals, bass drum, and other instruments. The author concluded that student frustration can result from attempting to play these different instruments; and that band directors should remember that young percussionists should learn to play not one but several instruments. Rack (1987) stated that the study and mastery of percussion instruments requires as much talent and guidance as with woodwind and brass instruments. The challenge for percussionists is greater with requirements for multiple instrument performance.

Masoner (1977) suggested that phrasing, articulation, tone quality, and dynamics are essential elements involved in playing musically, including the percussion section. These elements relate to sounds of percussion instruments,

how they fit the character of the music, and how they embellish the music being played.

Paxcia (1973) studied the effect of "melodic training" on the musical development of beginning percussionists. A music text and teacher's manual developed by the researcher was used to introduce melodic concepts to an experimental group while a control group received only rhythmic training. Paxcia concluded that students who received melodic training were superior to those who received only rhythmic training in the areas of aural perception, reading recognition, and notational understanding of tonal and rhythmic concepts.

Grumley (1983) investigated the challenge of including mallet instrument instruction for beginning percussionists. The author contends that by supplementing instruction with Orff mallet instruments, the beginning band program will expand a percussionist's concept of melody and harmony, and of percussion instruments. McClaren (1987) discussed the concept of the "Dumb Drummer Syndrome," describing a dichotomy between the needs of a percussionist and the fulfillment of those needs. Symptoms of this syndrome consisted of the following events which deviate from an acceptable standard: a lack of attention to the sequential musical development of percussion students; many percussion sections lack the basic instruments necessary to allow total development; keyboard instruments are seldom included in the training of young percussionists; the percussion section is

ignored during the band warm-up; and percussion parts in band music are non-stimulating.

Deficiencies in tonal instruction for percussionists have been addressed by various researchers. Pimentel (1977), in a survey of percussion texts, found a severe deficiency in space devoted to tonal aspects, such as discussion and musical examples for keyboard percussion instruments. Dire (1977) expressed the belief that the first several months of instruction are important to the musical development of young percussionists, and that this instruction should be based on the concepts of theory and listening. Casimino (1985) identified a need for knowledgeable and proficient percussionists with the increased use of contemporary music in public school band programs. Sampson (1968), in a survey of beginning band method books, noted a number of weaknesses in materials regarding rhythmic training and general percussion techniques. The issue of percussionists being prepared in pitch and rhythmic discrimination skills as compared to other instrumentalists may be influenced by two factors (Pimentel, 1979): a lack of understanding of and inability to perform basic melodic and harmonic material on keyboard percussion instruments; and difficulty with basic skills such as ear training and sightsinging.

Addendum and Null Hypotheses

The research and literature that has been presented supports the need for further study and comparative analysis in the area of instrumental students' music achievement. Of importance to the researcher is the absence of current literature concerning music reading skills between instrumental students. The related literature concerning percussion instruction supports the objective of the current study: a comparative analysis of melodic and rhythmic music reading skills between high school percussion and wind instrument students.

The null hypotheses for this study are listed below, then restated as operational null hypotheses in Chapter V ($\alpha = .05$).

1. There is no significant difference in pitch discrimination scores between trumpet, clarinet, and percussion groups.
2. There is no significant difference in pitch recognition scores between trumpet, clarinet, and percussion groups.
3. There is no significant difference in rhythmic discrimination scores between trumpet, clarinet, and percussion groups.
4. There is no significant difference in advanced rhythmic discrimination scores between trumpet, clarinet, and percussion groups.

The secondary research objective is served by the following questions.

1. Will length of instruction on the principal instrument produce a significant difference in music reading scores when grouped by instrument?
2. Will private instruction on the principal instrument produce a significant difference in music reading scores when grouped by instrument?
3. Will private piano instruction produce a significant difference in music reading scores when grouped by instrument?
4. Will other music training or experience produce a significant difference in music reading scores when grouped by instrument?
5. Will there be significant interaction between any of the secondary variables and instrument?

CHAPTER III

PROCEDURES

Introduction

The purpose of this study was to compare the melodic and rhythmic reading skills of percussion, clarinet, and trumpet students in select North Carolina high school band programs. A secondary research objective included an analysis of music reading skills in association with: (1) number of years playing the instrument, (2) private instruction on the instrument, (3) private piano instruction, and (4) other out-of-school music training or experiences. The rationale presented in Chapter I supported the selection of clarinet and trumpet players for the study. The researcher determined that these instruments were most likely to provide representative and balanced numbers of band students for comparison with percussion players, in contrast to oboes, bassoons, and French horns, which traditionally are not present in comparative numbers in bands. To obtain a culmulative perspective of music reading achievement among instrumentalists, high school students (grades nine through twelve) were selected for this study.

Because music reading skills, primarily learned in school band instruction, were investigated in this study, an ex post facto research design was used. Kerlinger (1973)

states that in ex post facto research, the independent variables have already occurred and the researcher initiates a study with observation of the dependent variables. The independent variables are not manipulated, and are studied in retrospect regarding relationships and effects on the dependent variables. The study was, therefore, appropriately classified as ex post facto research.

Selection of Subjects

Band students in North Carolina high schools were used for the study with percussion, clarinet, and trumpet players serving as subjects. To obtain a representative sample of students from a diverse grouping of schools within a manageable geographical region from the home test site, a selection profile was established by the researcher. The profile consisted of two categorical classifications: (1) variables representing a cross section of North Carolina schools, and (2) variables to be controlled. The first group included rural/urban status of the school, socioeconomic status of the school population, school size, and band size. The second group included grade level of beginning instruction, stability of the band director (in position for at least three years), balance of instructional emphasis (marching/concert), and stability of school system (no recent middle/junior high conversion). Among the schools meeting the factors of the selection profile, percussion instrument inventories were assumed to be

relatively standard, with a representative number of traditional and keyboard percussion instruments available for student use.

Information for school selection was collected by surveying all 54 high schools in the North Central region of the state as defined by the North Carolina Department of Public Instruction. Phone numbers and names of officials of these schools were obtained from the North Carolina Education Directory (1990), and band directors and their school addresses were obtained from the North Carolina Music Teachers Directory (1990-91). Information was collected through a telephone interview conducted with administrators at each school. A comparison of profiles of the 54 schools revealed a cross-section of rural/urban status, socioeconomic status, school size, and band size. Variables that predominantly were controlled were grade level of beginning instruction, stability of the band director, general instructional emphasis, and stability of school. To obtain a study sample, 16 schools were selected randomly from the population. Profiles of the sample revealed a representation of the desired cross sectional variables, while maintaining homogeneity among the control variables. These profiles ensured that the sample represented a diverse grouping of schools from the North Central region of the state.

A letter (Appendix A) was mailed to the band directors at the sample schools describing the study and assessing each band director's willingness to participate in the study. The letter was followed by a phone call to the band directors to confirm their agreement to participate. Subsequent contacts produced permission from school officials for the study, and established visitation dates for data collection. Decisions regarding an adequate number of subjects were based on the criteria established by Kerlinger and Pedhazur (1973). They indicated that using a large and representative sample, of at least 100 subjects to 200 or more, strengthens statistical estimates. Using these guidelines, a sample of approximately 400 subjects was considered a reasonable target number for this study, thus providing a margin for attrition. The sixteen schools initially selected from the region were assumed to contain the 400 subjects. As expected, scheduling and activity conflicts at various schools reduced the original sample, and twelve schools ultimately were used for data collection. These schools provided 388 subjects among the trumpet, clarinet, and percussion students.

Table 1 shows the profiles of the final sample pertaining to the four cross-sectional variables. School size ranged from 625 students to 1409 students, with a mean of 941.42. Band size ranged from 50 to 149 students, with a mean of 85.92. Socioeconomic status (SES) and rural/urban

status were determined from estimates by school principals. The socioeconomic status among the schools represented a relatively balanced cross section of levels. Three were lower SES, two were middle SES, and one was upper SES. The six remaining schools represented a combination of socioeconomic levels. One was a general mix, one contained an equal combination of lower/upper SES, one contained all three SESs, and three were middle-to-upper SES. There was an almost equal division of rural/urban classification; six schools were rural, five were urban, and one was a 50/50 combination. Additional profile data not presented in the table reveal that band instruction in all twelve school systems started in the sixth grade; the instructional emphasis at the twelve schools contained the same ratio of marching and concert bands; all directors had been in their positions for at least three years; and all of the schools included grades nine through twelve.

Instruments for Measuring the Dependent Variable

According to Gordon (1971), comprehensive standardized music achievement tests can be used to compare music achievement among individuals and groups of students. Gordon considered music achievement tests most appropriate for assessing students' music literacy skills. Colwell (1969) stated that the use of standardized music tests is important in the teaching and learning of instrumental music. After an extensive survey of published standardized

music achievement tests, the Music Achievement Test (MAT) (Colwell, 1968, 1970) was chosen as most appropriate because it measures melodic and rhythmic music reading skills directly applicable to this study.

Table 1

School Information Pertaining to Cross-Sectional Variables

School	Size	Band	Soc/Eco	Urban/Rural
1	1050	100	Mix	Urban
2	704	58	Low	50/50
3	706	50	Low	Rural
4	1000	73	Low	Rural
5	1409	85	Mid/Upper	Urban
6	970	149	Low/Upper	Urban
7	1000	83	Middle	Rural
8	1126	83	Upper	Rural
9	892	80	Mid/Upper	Urban
10	625	55	Low/Mid/Upper	Rural
11	780	120	Middle	Rural
12	1035	95	Mid/Upper	Urban
	N= 11297	1031		
	M= 941.42	85.92		

The MAT contained four levels of tests with each level measuring different skills. The following levels and subtests specifically measured music reading skills of concern in this study.

Level 2: Part 3--Auditory-Visual Discrimination
Subtest a: pitch (12 items)
Subtest b: rhythm (12 items)

In the Interpretive Manual for Level 2 (1969), Colwell stated: "All music curriculums cite ability in music reading as an objective, considering it essential to full musical understanding" (p. 113). Colwell designed the Auditory-Visual part of Level 2 to measure a student's understanding of music symbols. In each item, the student compares a printed four-measure phrase with what is heard on the recording and indicates any discrepancies in each of the four measures. Subtest "a" measures pitch errors and subtest "b" measures rhythm errors. Using the Kuder-Richardson 21 formula for reliability, Colwell reported a coefficient of .91 for both subtests, considered in the literature to be highly satisfactory for group measurement (Leonhard & House, 1972).

Level 3: Part 3--Pitch Recognition (20 items)

Colwell describes pitch recognition as the ability to mentally hear notated pitches. According to Colwell, Part 3 measures the ability to read notes since a student must recognize both direction and interval between two written notes. Each item consists of two notes printed on the

answer sheet. The first recorded tone is presented, then after a brief pause, three more tones are presented. The student indicates which of the three tones, or none, match the second note printed on the page. Colwell reported reliability coefficients ranging from .71 to .79 for grades 9 through 12. Leonhard and House (1972) consider coefficients in this range adequate for group measurement.

Level 4: Part 2--Auditory-Visual Discrimination (14 items)

Colwell constructed Part 2 to measure the ability to read rhythms accurately. Each item consists of a four-measure phrase notated on the answer sheet. The student listens to a four-measure phrase while following the notation and identifies each measure that contains a rhythmic discrepancy between what is heard and what is seen. Reliability coefficients ranging from .76 to .81 are reported for grades 9 through 12. This range is considered adequate to satisfactory for group measurement (Leonhard and House, 1972).

According to Boyle and Radocy (1987), content validity of Colwell's tests was established on basal text objectives and teacher judgements, and criterion-related validity was confirmed by a correlation of .92 between the top and bottom 20 percent of selected classes and test scores. Because of the adequate-to-satisfactory reliability and validity coefficients reported in the literature, and the appropriateness to the measurement needed for the study, the

MAT was considered to be the instrument best suited for measuring melodic and rhythmic music reading skills.

Data Collection

The MAT is available on four long-play recordings. To ensure standardized testing conditions at the various schools, a cassette tape was made of the specific levels and subtests that were used for the study. Permission to copy the recordings onto a cassette tape was granted by Richard Colwell, author and current owner of the MAT (Appendix B). The recordings were played on a Pioneer PL-71 direct drive turntable and were copied onto a Denon HD8 cassette tape using a Pioneer CT-F500 stereo cassette deck and a Marantz 2275 receiver. After all test materials were collected and prepared, testing procedures were established and verified through faculty consultation. The researcher then began school visitation to administer the MAT. The subtests of the MAT selected for the study were administered to percussion, clarinet, and trumpet students enrolled in band at each of the sample schools. The students at these schools were tested during their scheduled band period. Data collection started in October 1991 and was completed in December 1991.

Upon arrival at each school, the researcher met the band director and set up the test equipment in the band room or designated room with similar acoustics. To ensure standardized test presentation at each school, the test tape

was played on a General Electric 3-5452B stereo cassette recorder with built-in speakers.

At the beginning of the scheduled band period, the trumpet, clarinet, and percussion players were seated in close proximity to the test equipment. The band director introduced the researcher to the students and briefly explained the purpose of the visit. The researcher then proceeded with instructions and test administration. Before testing procedures commenced, students completed a music experience and background questionnaire (Appendix C). After the questionnaires were collected, test answer sheets were distributed and standardized test procedures were read (Appendix D). Each of the four subtests of the MAT also were discussed with the students, explaining content and required tasks. When the students signified that the instructions were understood, the researcher started the tape and testing proceeded. Total testing time, including the questionnaire, instructions and testing, was approximately 45 minutes at each school. When testing was finished, answer sheets were collected according to instrument group by the researcher.

Preparation of Data for Analysis

Upon completion of the data collection at the twelve schools, a data file was formulated on a VAX/VMS computing system. Information from the student questionnaires was entered in the file using a number coding system for grade

level, instrument, years of instruction, private lessons, piano experience, and other music instruction. Percussion students ranked their experience on various percussion instruments on a scale from 1 to 5, with 1 representing the most experience and 5 representing no experience.

The first two subtests (pitch and rhythm), from Level 2: Part 3, were machine-scored using an NCS Sentry 3000 Scanner. Those scores were entered into the file as Pitch1 and Rhythm1. The other two parts, Pitch Recognition and Auditory-Visual Discrimination (rhythm) required hand-scoring by the researcher, and were entered as Pitch2 and Rhythm2.

Data Analyses

The independent variable was instrument group (percussion, clarinet, and trumpet). The dependent variables were the scores on the subtests of the MAT. Two melodic reading scores and two rhythmic reading scores were obtained for each subject. To retain the cross sectional profiles for rural/urban status, socioeconomic status, school size, and band size, and form three groups for analysis, test scores from all sample schools were combined by instrument group into one composite score for each subtest. This process collapsed all boundaries between schools and created three instrument groups, percussion, clarinet, and trumpet, each with two composite melodic scores and two composite rhythmic scores. It was determined

by the researcher that possible variance of scores between schools would not affect the statistical results since mean scores were being analyzed across the three instrument groups instead of across the school boundaries.

The difference between instrument groups regarding music reading skill was the principal research objective in this study. Since the null hypotheses treated the pitch and rhythmic tests independently, a series of univariate analyses of variance were computed for each of the composite test scores. When the univariate analyses were significant, post hoc analyses of mean differences were completed using Tukey's Honest Significant Difference Test.

The secondary research questions were directed toward the effects of years of instruction, private instruction, piano instruction, and other music training or experience on each of the pitch and rhythmic subtest scores of the three instrument groups; and possible interactions between these variables and the instrument variable. The investigation of interactions served to augment the comparative analysis of the three instrument groups in this study. Two-way analyses of variance were computed for each of the secondary variables and the instrument variable to determine significant effects and interactions. As the second factor in the two-way analyses of variance, the instrument variable was retained principally to study the interactions.

CHAPTER IV
DATA ANALYSES

A statistical presentation of data collected from the sample of subjects used in the study, and the results and discussion of the analyses of the Music Achievement Test (MAT) scores as dependent variables are central in this chapter. To facilitate discussion of statistical analyses, Table 2 provides a list of variables used in classifying the four subtests of the MAT that were administered to the subjects.

Table 2

Variable Labels Used in Analysis of Test Data

Test Level	Subtest Title	Variable Label
Level 2: Part 3	Auditory-Visual Discrimination	
	Subtest a: pitch	Pitch1
Level 3: Part 3	Pitch Recognition	Pitch2
Level 2: Part 3	Auditory-Visual Discrimination	
	Subtest b: rhythm	Rhythm1
Level 4: Part 2	Auditory-Visual Discrimination	Rhythm2

In addition to data collected from the four MAT subtests, which served individually as the dependent variables, the following student questionnaire data pertinent to the analyses were obtained: (1) number of years playing the instrument, (2) private instruction on the instrument, (3) private piano instruction, and (4) other out-of-school music training or experiences. Data for these four variables then were categorically combined across the twelve schools within the three instrument groupings: trumpet, clarinet, and percussion.

The frequency of subjects by instrument group and grade level, and the total sample size, are shown in Table 3.

Table 3

Distribution of Band Students by Instrument Group and Grade Level

Instrument	Grade				Total
	9	10	11	12	
Trumpet	53	39	25	25	142
Clarinet	57	39	27	16	139
Percussion	35	33	17	22	107
				Total	388

The total sample of 388 subjects exceeded criteria for sample size established by Kerlinger and Pedhazur (1973). In addition, the distribution of subjects across the three instrument groups approximated proportions that represent standard instrumentation in high school bands.

Analyses of Test Scores

Discussion of the test analyses includes separate treatment of instrument categories; however, primary attention is directed toward differences between the two wind instrument groups and the percussion group. Table 4 shows the means and standard deviations by instrument group of the scores from the four MAT subtests.

Table 4

Mean Scores and Standard Deviations on the MAT,
by Instrument Group

Test	Max	Trumpet		Clarinet		Percussion	
		<u>M</u>	SD	<u>M</u>	SD	<u>M</u>	SD
Pitch1	28	16.70	6.03	13.51	6.83	13.81	6.72
Pitch2	20	11.23	3.10	9.92	2.62	9.65	3.68
Rhythm1	32	24.86	6.96	22.89	7.04	23.44	7.67
Rhythm2	19	9.71	3.90	8.86	3.68	9.20	4.17

The trumpet group scored highest on the Pitch1 subtest ($\underline{M} = 16.70$), and the clarinet group scored the lowest ($\underline{M} = 13.51$). The mean score for the percussion group was 13.81, which was only .3 higher than the clarinet mean score. The trumpet group scored the highest on the Pitch2 subtest ($\underline{M} = 11.23$), followed by the clarinet group ($\underline{M} = 9.92$) and the percussion group ($\underline{M} = 9.65$). The table shows that the trumpet group had the highest mean score for the Rhythm1 subtest ($\underline{M} = 24.86$), followed by the percussion group ($\underline{M} = 23.44$) and the clarinet group ($\underline{M} = 22.89$). The Rhythm2 subtest mean score for the trumpet group was 9.71. The percussion group scored second highest with a mean score of 9.20, and the clarinet group scored lowest ($\underline{M} = 8.86$). Across the four subtests, Table 4 shows that the percussion group means are consistently lower than the trumpet group means and are similar to the clarinet group means, which ranked lowest in all but the Pitch2 subtest. Figure 1 shows a comparison of mean scores for the three instrument groups.

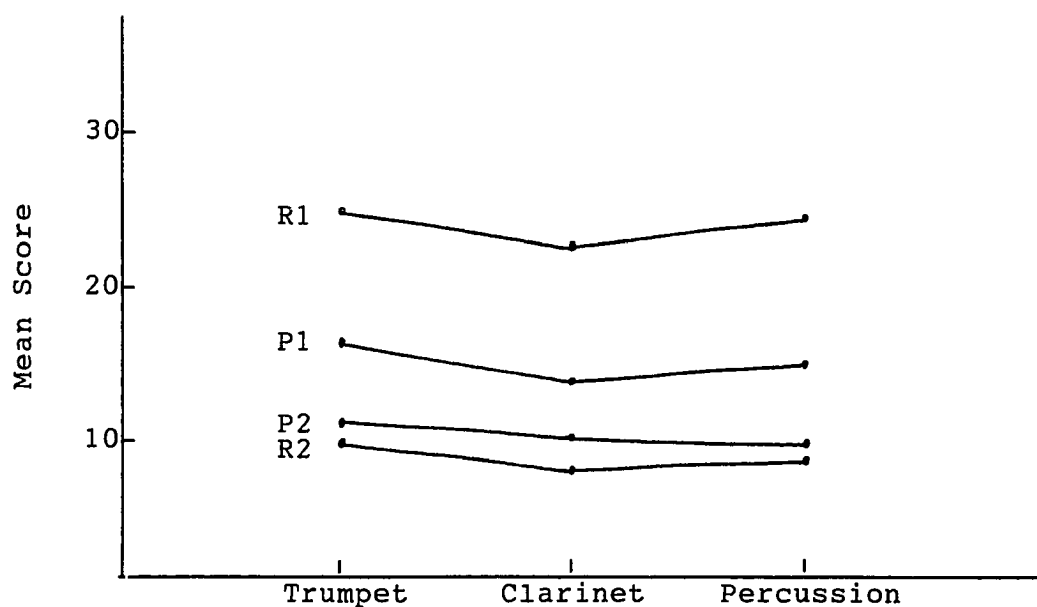


Figure 1. Mean scores of the three instrument groups on the four subtests of the MAT.

To determine if there were significant differences in pitch and rhythmic reading scores between the three instrument groups, a univariate analysis of variance was computed for each of the four subtests of the MAT. Table 5 shows a summary of the analyses for each subtest.

The analyses showed a significant difference between instrument groups for Pitch1, $F(2, 385) = 10.01, p = .0001$, and for Pitch2, $F(2, 385) = 9.69, p = .0001$. There was no significant difference between instrument groups for the Rhythm1 and Rhythm2 subtests.

Table 5

Analyses of Variance Between Instrument Groups for Pitch1,
Pitch2, Rhythm1, and Rhythm2 Subtests

Test	Source	df	SS	MS	F	p
Pitch1	Instrument	2	849.61	424.81	10.01	.0001
	Error	385	16340.57	42.44		
	Total	387	17190.19			
Pitch2	Instrument	2	187.76	93.88	9.69	.0001
	Error	385	3731.67	9.69		
	Total	387	3919.43			
Rhythm1	Instrument	2	287.27	143.63	2.78	.0634
	Error	385	19906.92	51.71		
	Total	387	20194.19			
Rhythm2	Instrument	2	51.21	25.61	1.69	.1868
	Error	385	5850.44	15.20		
	Total	387	5901.66			

To determine between which instrument groups significant differences occurred in the Pitch1 and Pitch2 subtests, the Tukey Honest Significant Difference Test (HSD) was computed. For both subtests, there were significant differences between the means of trumpet and percussion players, $p = .05$, and trumpet and clarinet players, $p = .05$. There was no significant difference between the means of clarinet and percussion players on either subtest. In the Pitch1 subtest, the difference between the trumpet and percussion mean scores was 2.89; and the difference between the trumpet and clarinet means was 3.19. The percussion

group mean score was .30 higher than the clarinet group. In the Pitch2 subtest, the difference between the trumpet and percussion mean scores was 1.58, and the difference between the trumpet and clarinet means was 1.31. The percussion group mean score was .27 lower than the clarinet group. This post hoc procedure showed that the percussion group produced MAT scores that were significantly different (lower) than the trumpet group for both Pitch subtests. The percussion group mean scores, however, were higher on the Pitch1 subtest and lower on the Pitch2 subtest than the clarinet group, although these comparisons were not significantly different.

Effects of Secondary Variables on Test Scores

A secondary area of interest in this study was to determine the effects of years of instruction (ranging from one to nine years), private instruction, private piano instruction, and other music training and experience on pitch and rhythmic reading scores of the subjects as categorized by the three instrument groups. The principal objective in these analyses was to determine if there were significant interactions between each of these four variables and the instrument groups; and to determine significant differences in main effects for each secondary variable. To determine effects of each variable when analyzed separately, and possible interactions between instrument group and each variable, four two-way analyses of

variance were computed independently for each variable. It was recognized that these procedures produced redundancy in the analysis of the instrument variable. Based on the objective of separate analyses of the secondary variables, the researcher, upon consultation, elected an independent approach as shown in the univariate analyses of variance. As explained in Chapter III, the instrument variable was retained for each two-way analysis of variance principally to study interactions.

Number of Years of Instruction on the Instrument

Subject responses for the number of years of instruction on trumpet, clarinet, or percussion ranged from one to nine years. Table 6 shows the frequencies for each instrument group by the number of years of instruction. The table shows that over half, or 52.8% of the subjects from the three instrument groups combined had received four to five years of instruction. For the trumpet group, 56.3% of the subjects had received four to five years of instruction; for the clarinet group, 52.5% of the subjects had received four to five years of instruction; and for the percussion group, 48.6% of the subjects had received four to five years of instruction.

Pitch1 & Pitch2

To determine effects of years of instruction and interaction with the instrument variable on each of the MAT

Table 6

Frequency of Years of Instruction by Instrument

Yrs	Trumpet	Clarinet	Percussion
1	2	0	9
2	3	5	9
3	14	23	16
4	48	43	26
5	32	30	26
6	17	24	10
7	23	11	10
8	3	1	1
9	0	2	0

subtest scores, a two-way analysis of variance was computed for each of the four subtests. A summary of the analyses is shown in Table 7. The analysis for Pitch1 showed no significant difference for the main effect of years of instruction; however, there was a significant difference for the main effect of instrument group, $F(2, 364) = 8.93$, $p = .0002$. There was no significant interaction between years of instruction and instrument on Pitch1 subtest scores. For the Pitch2 subtest, the analysis revealed a significant difference for the main effect of years of instruction, $F(8, 364) = 2.15$, $p = .0308$; and for the main effect of

instrument group, $F(2, 364) = 9.23$, $p = .0001$. There was no significant interaction between years of instruction and instrument on Pitch2 subtest scores. The significant main effect of instrument group under the condition of years of instruction is consistent with the results of the Pitch1 and Pitch2 univariate analyses of variance.

Table 7

Summary of Analyses of Variance for Years of Instruction

Test	Source	df	SS	MS	F	p
Pitch1	Noyrs	8	284.11	35.51	0.83	.5768
	Inst	2	764.60	382.30	8.93	.0002
	Noyrs*Inst	13	562.75	43.29	1.01	.4393
	Error	364	15578.73	42.80		
Pitch2	Noyrs	8	160.03	20.00	2.15	.0308
	Inst	2	171.87	85.94	9.23	.0001
	Noyrs*Inst	13	198.10	15.23	1.64	.0732
	Error	364	3389.42	9.31		
Rhythm1	Noyrs	8	1060.12	132.52	2.70	.0068
	Inst	2	252.24	126.19	2.57	.0781
	Noyrs*Inst	13	1000.59	76.97	1.57	.0923
	Error	364	17881.23	49.12		
Rhythm2	Noyrs	8	412.37	51.55	3.60	.0005
	Inst	2	42.65	21.32	1.49	.2271
	Noyrs*Inst	13	230.90	17.76	1.24	.2489
	Error	364	5215.74	14.33		

To determine between which category of years of instruction significant differences occurred for the Pitch2 subtest scores, the Tukey Honest Significant Difference Test

was computed. Results showed a significant difference between subtest scores of subjects that received three years of instruction and subjects that received five years of instruction, $p = .05$. The difference between the means of the two groups was 2.06 points (three year group $\bar{M} = 8.92$; five year group $\bar{M} = 10.98$).

*Further examination of the mean scores for groups receiving three and five years of instruction by instrument revealed an increase in scores for the trumpet and percussion groups with five years of instruction, but a slight decline for the clarinet group. Table 8 shows the Pitch2 subtest mean scores, by instrument. The table shows that as years of instruction increase from three to five years, the Pitch2 mean scores increase, except for the clarinet group. Apparently, the mean scores for the trumpet and percussion groups were the principal contributors for significance. These findings indicate that the increase in years of instruction from three to five years affected the Pitch2 subtest scores differently for the clarinet group, even though interpretation is somewhat difficult.

*Since the mean scores varied occasionally within and between instrument groups, in unexpected ways, further examination of the differences between years of instruction by instrument was warranted. Examination of mean scores by instrument was utilized in the other secondary variables when such discussion was relevant to the instrument group comparisons.

Table 8

Mean Scores on Pitch2 Subtest for Subjects Receiving Three
and Five Years of Instruction, by Instrument

Yrs	Trumpet	Clarinet	Percussion
3	8.60	10.04	7.63
5	12.63	9.70	10.46

Rhythm1 & Rhythm2

For the Rhythm1 subtest, there was a significant difference for the main effect of years of instruction, $F(8, 364) = 2.70, p = .0068$. There was no significant difference for the main effect of instrument group, and no significant interaction between years of instruction and instrument group on Rhythm1 subtest scores. Similar results were reported for the Rhythm2 subtest, with a significant difference for the main effect of number of years, $F(8, 364) = 3.60, p = .0005$. There was no significant difference for the main effect of instrument group, and no significant interaction between years of instruction and instrument group on Rhythm2 subtest scores. The nonsignificant main effect of instrument group under the condition of years of instruction was consistent with the results of the Rhythm1 and Rhythm2 univariate analyses of variance.

To determine between which category of years of instruction significant differences occurred for the main effect of years of instruction on the Rhythm1 and Rhythm2 subtests, Tukey's Honest Significant Difference Test was computed for each subtest. For the Rhythm1 subtest, the procedure revealed a significant difference between mean scores of subjects that had received three years of instruction and six years of instruction, $p = .05$. The difference between mean scores was 4.48 points (three year group $\bar{M} = 21.36$; six year group $\bar{M} = 25.84$).

Further examination of the subtest mean scores for each instrument group revealed an increase in scores for all three instrument groups from three to six years of instruction. Table 9 shows the Rhythm1 subtest mean scores for each group, by instrument. The table shows that as years of instruction increase from three to six years, the Rhythm1 mean scores increase for all three instrument groups; however, the smallest increase occurred in the percussion group.

Table 9

Mean Scores on Rhythm1 Subtest for Subjects Receiving Three and Six Years of Instruction, by Instrument

Yrs	Trumpet	Clarinet	Percussion
3	21.00	21.28	21.88
6	28.94	25.00	22.60

For the Rhythm2 subtest, there were significant differences in mean scores between the following comparisons of years of instruction, $p = .05$: (1) three and six years of instruction, (2) four and six years of instruction, and (3) three and five years of instruction. Table 10 shows the Rhythm2 subtest mean scores for each significant comparison of years of instruction. Table 11 shows further examination of the significant comparisons for years of instruction, by instrument group. The table shows an increase in mean scores for all comparisons except the percussion group in the four to six year comparison.

Table 10

Mean Scores on Rhythm2 Subtest for Significant Years of Instruction Comparisons

Comparison	Mean Score
3-6	3 7.81
	6 10.61
4-6	4 8.60
	6 10.61
3-5	3 7.81
	5 9.97

Except for the Pitch1 subtest, there is an apparent trend for the main effect of years of instruction across the subtest mean scores. There is a significant difference in scores for subjects that have received from three to six years of instruction, from three to five years of instruction, and from four to six years of instruction. Apparently, these years are particularly important in affecting Pitch2, Rhythm1, and Rhythm2 subtest mean scores.

Table 11

Mean Scores on Rhythm2 Subtest for Significant Comparisons
of Years of Instruction, by Instrument

Comparison	Trumpet	Clarinet	Percussion
3-6	3 7.79	3 7.91	3 7.69
	6 12.82	6 9.88	6 8.60
4-6	4 8.73	4 8.21	4 9.00
	6 12.82	6 9.88	6 8.60
3-5	3 7.79	3 7.91	3 7.69
	5 10.28	5 9.27	5 10.38

Private Instruction on Principal Instrument

The subjects' main response concerning this variable was whether they had received private lessons on their principal instrument of trumpet, clarinet, or percussion. The frequency of responses for the total sample shows that 335 subjects had not received private instruction, and only 53 subjects had received private instruction. The frequency of responses for each instrument group is shown in Table 12. Within the trumpet group, 13.4% of the subjects had received private instruction on their instrument; within the clarinet group, 5.8% of the subjects had received private instruction; and within the percussion group, 24.3% of the subjects had received private instruction. The table shows

that the percussion group had the highest number of students who had received private instruction ($N = 26$).

Table 12

Frequency of Private Instruction by Instrument

Instrument	Yes/No	%/Group	%/Sample
Trumpet	No 123	86.6	31.7
	Yes 19	13.4	4.9
Clarinet	No 131	94.2	33.8
	Yes 8	5.8	2.1
Percussion	No 81	75.7	20.9
	Yes 26	24.3	6.7

To determine effects of private instruction and possible interaction with the instrument variable on each of the MAT subtest scores, a two-way analysis of variance was computed for each of the four subtests. A summary of the analyses is presented in Table 13.

Pitch1 & Pitch2

The analysis for Pitch1 showed no significant difference for the effect of private instruction. However, there was a significant difference for the effect of instrument group, $F(2, 382) = 10.13, p = .0001$. In addition, there was significant interaction between private instruction and instrument on Pitch1 subtest scores, $F(2,$

382) = 3.68, $p = .0261$. The results of the Pitch2 subtest yielded similar findings to those of the Pitch1 subtest. The table showed no significant difference for the main effect of private instruction and a significant difference for the main effect of instrument group, $F(2, 382) = 9.68$, $p = .0001$. The results showed there was significant interaction between private instruction and instrument on Pitch2 subtest scores, $F(2, 382) = 3.65$, $p = .0268$. The significant main effect of instrument group under the condition of private instruction was consistent with the results of the Pitch1 and Pitch2 univariate analyses of variance. The significant interaction between private instruction and instrument on the Pitch1 and Pitch2 subtest scores showed that, apparently, private instruction did not influence pitch discrimination and recognition scores uniformly with the condition of instrument.

Table 13

Summary of Analyses of Variance for Private Instruction

Test	Source	<u>df</u>	SS	MS	<u>F</u>	<u>p</u>
Pitch1	Privles	1	0.90	0.90	0.02	.8834
	Inst	2	850.40	425.20	10.13	.0001
	Privles*Inst	2	308.89	154.44	3.68	.0261
	Error	382	16029.99	41.96		
Pitch2	Privles	1	9.05	9.05	0.95	.3315
	Inst	2	185.17	92.59	9.68	.0001
	Privles*Inst	2	69.94	34.97	3.65	.0268
	Error	382	3655.27	9.57		
Rhythm1	Privles	1	141.85	141.85	2.74	.0986
	Inst	2	274.60	137.30	2.65	.0716
	Privles*Inst	2	17.28	8.64	0.17	.8462
	Error	382	19760.45	51.73		
Rhythm2	Privles	1	205.32	205.32	14.04	.0002
	Inst	2	45.94	22.97	1.57	.2091
	Privles*Inst	2	65.72	32.86	2.25	.1070
	Error	382	5584.67	14.62		

Table 14 shows the Pitch1 and Pitch2 subtest mean scores, by private instruction and instrument. For the Pitch1 subtest, the table shows that the subjects who had received private instruction achieved higher mean scores than those who had not received private instruction. However, within the percussion group, the mean score is lower for those subjects that had received private instruction. The Pitch2 subtest mean scores show similar results to those of Pitch1. The trumpet and clarinet mean scores are higher for those who had received private

instruction; however, the percussion mean scores are lower for those who had received private instruction. The significant interaction between private instruction and instrument shows that private instruction did not influence pitch discrimination and recognition scores uniformly across the condition of instrument. Figures 2 and 3 supplement Table 14 with graphic illustrations of the interactions between the Pitch1 and Pitch2 subtest scores and instrument group. The figures show how the percussion group mean scores decrease for the private instruction group, in contrast to the trumpet and clarinet groups who received private instruction.

Table 14

Mean Scores on Pitch1 and Pitch2 Subtests, by Private Instruction and Instrument

PrivInst	Trumpet	Clarinet	Percussion
Pitch1			
No	16.46	13.34	14.57
Yes	18.32	16.25	11.46
Pitch2			
No	11.18	9.84	10.07
Yes	11.58	11.25	8.35

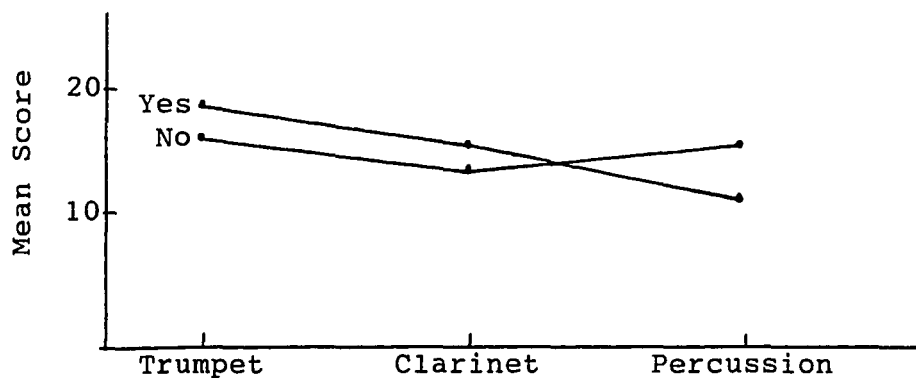


Figure 2. Private instruction-instrument two-way interaction for Pitch1 subtest.

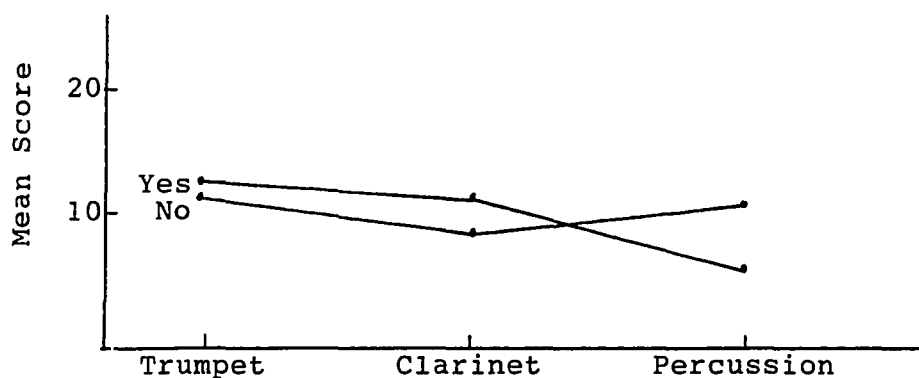


Figure 3. Private instruction-instrument two-way interaction for Pitch2 subtest.

Rhythm1 & Rhythm2

The analysis of variance for the Rhythm1 subtest revealed no significant difference for the main effect of private instruction and no significant difference for the main effect of instrument group. There was no significant interaction between private instruction and instrument. The analysis of variance for the Rhythm2 subtest showed a

significant difference for the main effect of private instruction, $F(1, 382) = 14.04$, $p = .0002$. The Rhythm2 mean score for subjects who had received private instruction was 11.09; the Rhythm2 mean score for subjects who had not received private instruction was 8.98. There was no significant difference for the main effect of instrument group and no significant interaction between private instruction and instrument. The nonsignificant main effect of instrument group under the condition of private instruction was consistent with the results of the Rhythm1 and Rhythm2 univariate analyses of variance.

Further examination of Rhythm2 subtest mean scores for each instrument and the effect of private instruction is shown in Table 15. The table shows that Rhythm2 subtest mean scores were higher for all three instrument groups for subjects who had received private instruction; with the smallest increase occurring within the percussion group.

Table 15

Mean Scores on Rhythm2 Subtest for Private Instruction, by Instrument

PrivInst	Trumpet	Clarinet	Percussion
No	9.24	8.73	8.99
Yes	12.79	11.13	9.85

Private Piano Instruction

Subjects responded to this item by indicating whether they had received private piano instruction. The composite responses indicated that 259 subjects had not received private piano instruction, and 129 subjects had received private piano instruction. Table 16 shows the responses to piano instruction by instrument group. The table shows that the percussion group had the lowest percentage of subjects (29.9%) who had received private piano instruction.

Table 16

Frequency of Private Piano Instruction, by Instrument

Instrument	Yes/No		%/Group	%/Sample
Trumpet	No	98	69.0	25.3
	Yes	44	31.0	11.3
Clarinet	No	86	61.9	22.2
	Yes	53	38.1	13.7
Percussion	No	75	70.1	19.3
	Yes	32	29.9	8.2

To determine effects of piano instruction and possible interaction with the instrument variable on each of the MAT subtest scores, a two-way analysis of variance was computed for each of the four subtests. Results are provided in Table 16.

Pitch1 & Pitch2

The analysis of variance for the Pitch1 subtest showed a significant difference for the main effect of piano instruction, $F(1, 382) = 21.94$, $p = .0001$, and a significant difference for the main effect of instrument group, $F(2, 382) = 11.56$, $p = .0001$. There was no significant interaction between private piano instruction and instrument. The analysis of variance for the Pitch2 subtest yielded similar results to those of the Pitch1 subtest. The analysis showed a significant difference for the main effect of private piano instruction, $F(1, 382) = 11.28$, $p = .0009$, and a significant difference for the main effect of instrument group, $F(2, 382) = 10.36$, $p = .0001$. There was no significant interaction between private piano instruction and instrument on Pitch2 subtest scores. The significant main effect of instrument group under the condition of private piano instruction was consistent with the results of the Pitch1 and Pitch2 univariate analyses of variance.

For the Pitch1 subtest, the mean score for subjects having received private piano instruction ($M = 16.90$) was significantly higher than the mean score for subjects who had not received private piano instruction ($M = 13.70$). For the Pitch2 subtest, the mean score for subjects having received piano instruction ($M = 11.07$) was significantly higher than the mean score for subjects who had not received private piano instruction ($M = 9.96$).

Table 17

Analyses of Variance for Private Piano Instruction

Test	Source	<u>df</u>	SS	MS	<u>F</u>	<u>p</u>
Pitch1	Piano	1	881.99	881.99	21.94	.0001
	Inst	2	929.51	464.75	11.56	.0001
	Piano*Inst	2	22.26	11.13	0.28	.7583
	Error	382	15356.43	40.20		
Pitch2	Piano	1	106.53	106.53	11.28	.0009
	Inst	2	195.83	97.92	10.36	.0001
	Piano*Inst	2	8.07	4.04	0.43	.6526
	Error	382	3609.00	9.45		
Rhythm1	Piano	1	914.28	914.28	18.48	.0001
	Inst	2	347.90	173.95	3.52	.0307
	Piano*Inst	2	34.39	17.19	0.35	.7066
	Error	382	18897.62	49.47		
Rhythm2	Piano	1	525.66	525.66	38.08	.0001
	Inst	2	74.06	37.03	2.68	.0697
	Piano*Inst	2	29.03	14.52	1.05	.3504
	Error	382	5272.91	13.80		

Further examination of the Pitch1 and Pitch 2 subtest mean scores for each instrument group and the effect of private piano instruction is shown in Table 18. The table shows that Pitch1 and Pitch2 subtest mean scores were higher across all three instrument groups for subjects who have received private piano instruction. However, between the three instrument groups, the percussion Pitch1 subtest mean scores ranked second for those who had received piano instruction; and the percussion Pitch2 subtest mean scores were lowest for those who had received piano instruction.

Table 18

Pitch1 and Pitch2 Mean Scores According to Private Piano Instruction, by Instrument

PrivPiano	Trumpet	Clarinet	Percussion
Pitch1			
No	15.88	12.07	12.72
Yes	18.55	15.85	16.38
Pitch2			
No	11.00	9.37	9.27
Yes	11.75	10.81	10.56

Rhythm1 & Rhythm2

The analysis of variance for the Rhythm1 subtest showed a significant difference in subtest scores as a result of private piano instruction, $F(1, 382) = 18.48, p = .0001$. The analysis revealed no significant difference for the main effect of instrument group and no significant interaction between private piano instruction and instrument group on Rhythm1 subtest scores. The analysis for Rhythm2 showed a significant difference for the main effect of private piano instruction, $F(1, 382) = 38.08, p = .0001$. The results showed no significant difference for the main effect of instrument group and no significant interaction between

private piano instruction and instrument on Rhythm2 subtest scores. The nonsignificant main effect of instrument group under the condition of private piano instruction was consistent with the results of the Rhythm1 and Rhythm2 univariate analyses of variance.

The Rhythm1 mean score for subjects who had received private piano instruction ($\underline{M} = 25.94$) was significantly higher than the mean score for those who had not received private piano instruction ($\underline{M} = 22.68$). The Rhythm2 mean score for subjects having received private piano instruction ($\underline{M} = 10.91$) also was significantly higher than the mean score for subjects who had not received private piano instruction ($\underline{M} = 8.44$).

Further examination of the Rhythm1 and Rhythm2 mean scores for each instrument group and the effect of private piano instruction is shown in Table 19. The table shows that the mean scores across all three instrument groups are higher for those subjects that have received private piano instruction. However, the percussion Rhythm1 subtest mean scores ranked second for those who had received piano instruction; and the percussion Rhythm2 subtest mean scores were lowest for those who had received piano instruction.

Table 19

Mean Scores on Rhythm1 and Rhythm2 Subtests According to
Private Piano Instruction, by Instrument

PrivPiano	Trumpet	Clarinet	Percussion
Rhythm1			
No	24.00	21.30	22.53
Yes	26.77	25.47	25.56
Rhythm2			
No	9.07	7.62	8.57
Yes	11.14	10.89	10.66

Other Music Training/Experiences

Subject responses to this item indicated whether they had acquired other out-of-school music training or experience. Other music training or experience refers to band camp, solo/ensemble festival, all-district/all-state band, or community group. The composite frequency of responses for this item showed that 195 subjects had not received other music training or experience, and 193 had received other music training or experience. Table 20 shows the frequency of responses by instrument for other music instruction. The data showed that within the percussion group, 51.4% of the subjects had received other

music training or experience; however, the percussion group ranked the lowest in the number of subjects that had received other music training ($N = 55$).

Table 20

Frequency of Other Music Training/Experience by Instrument

Instrument		Frequency	%/Group	%/Sample
Trumpet	No	77	54.2	19.8
	Yes	65	45.8	16.8
Clarinet	No	66	47.5	17.0
	Yes	73	52.5	18.8
Percussion	No	52	48.6	13.4
	Yes	55	51.4	14.2

To determine effects of other music training/experience and possible interaction with the instrument variable on each of the MAT subtest scores, a two-way analysis of variance was computed for each of the four subtests. A summary of the analyses is shown in Table 21.

Pitch1 & Pitch2

The analysis of variance for Pitch1 resulted in a significant difference for the main effect of other music instruction, $F(1, 382) = 12.19$, $p = .0005$. The mean score for subjects that had received other music training/experience was 15.91; and the mean score for subjects that

had not received other music training/experience was 13.63. The analysis showed a significant difference for the main effect of instrument group, $F(2, 382) = 11.33, p = .0001$. There was no significant interaction between other music instruction and instrument group. The Pitch2 subtest analysis of variance resulted in no significant difference for the main effect of other music training, and a significant difference for the main effect of instrument group, $F(2, 382) = 9.87, p = .0001$. There was no significant interaction between other music instruction and instrument on Pitch2 subtest scores. The significant main effect of instrument group under the condition of other music training or experience was consistent with the results of the Pitch1 and Pitch2 univariate analyses of variance.

Further examination of the Pitch1 subtest mean scores for each instrument and the effect of other music training/experience is shown in Table 22. The table shows higher mean scores for each of the three instrument groups for subjects who had received other music training/experience.

Table 21

Analyses of Variance for Other Music Training/Experience

Test	Source	df	SS	MS	F	p
Pitch1	Othinst	1	502.45	502.45	12.19	.0005
	Inst	2	934.39	467.19	11.33	.0001
	Othinst*Inst	2	2.40	1.20	0.03	.9713
	Error	382	15750.95	41.23		
Pitch2	Othinst	1	2.27	2.27	0.23	.6285
	Inst	2	190.83	95.41	9.87	.0001
	Othinst*Inst	2	34.64	17.32	1.79	.1680
	Error	382	3691.70	9.66		
Rhythm1	Othinst	1	653.47	653.47	13.06	.0003
	Inst	2	343.44	171.72	3.43	.0333
	Othinst*Inst	2	82.50	41.25	0.82	.4393
	Error	382	19114.78	50.04		
Rhythm2	Othinst	1	195.67	195.67	13.36	.0003
	Inst	2	64.06	32.03	2.19	.1136
	Othinst*Inst	2	48.68	24.34	1.66	.1911
	Error	382	5593.25	14.64		

Table 22

Mean Scores on Pitch1 Subtest According to Other Music
Training/Experience, by Instrument

OthInst/Exp	Trumpet	Clarinet	Percussion
No	15.66	12.12	12.54
Yes	17.94	14.77	15.02

Rhythm1 & Rhythm2

The Rhythm1 subtest analysis of variance revealed a significant difference in subtest scores as a result of other music training/experience, $F(1, 382) = 13.06$, $p = .0003$. The mean score for subjects who had received other music training and experience was 25.07; and the mean score for subjects who had not received other music training and experience was 22.47. Analysis showed no significant difference for the main effect of instrument group and no interaction between other music training and instrument group on Rhythm1 subtest scores. The analysis for the Rhythm2 subtest yielded similar results to those of Rhythm1. The analysis of variance for Rhythm2 resulted in a significant difference for the main effect of other music training or experience, $F(1, 382) = 13.36$, $p = .0003$. The mean score for subjects who had received other music training and experience was 9.98; and the mean score for subjects who had not received other music training and experience was 8.56. Analysis showed no significant difference for the main effect of instrument group and no significant interaction between other music training or experience and instrument group. The nonsignificant main effect of instrument group under the condition of other music training or experience was consistent with the results of the Rhythm1 and Rhythm2 univariate analyses of variance.

Further examination of Rhythm1 and Rhythm2 subtest mean scores for each instrument group and the effects of other music training/experience is shown in Table 23. The table shows that Rhythm1 and Rhythm2 subtest mean scores for each of the three instrument groups are higher for subjects who have received other music training and experience. The percussion Rhythm1 subtest mean scores ranked second for those who had acquired other music training or experience; and the percussion Rhythm2 subtest mean scores were highest for those who had acquired other music training or experience.

Table 23

Rhythm1 and Rhythm2 Subtest Mean Scores According to Other Music Training/Experience, by Instrument

OthInst	Trumpet	Clarinet	Percussion
Rhythm1			
No	24.16	20.97	21.88
Yes	25.69	24.63	24.91
Rhythm2			
No	9.47	7.82	8.15
Yes	10.00	9.81	10.18

Summary

The results and discussion of the analyses of the scores from the four MAT subtests, as a function of primary and secondary variables, were central in this chapter. Of particular interest were: 1) comparisons of differences between the percussion group and the two wind instrument groups, 2) the main effects of the secondary variables on each of the four subtest mean scores, and 3) possible interactions between these variables and the instrument variable. To augment the discussion of the secondary variables, descriptive statistics for each secondary variable and examination of significant subtest mean scores were presented, by instrument group.

For the Pitch1 subtest, the percussion group mean scores ranked second, below the trumpet group for each of the variables. However, for private instruction, the percussion group achieved the lowest scores, below the trumpet and clarinet groups.

For the Pitch2 subtest, the trumpet group achieved the highest scores for each of the variables. The clarinet and percussion groups fluctuated between second and third place across the variables. The percussion group achieved the lowest scores for the instrument comparison, the private instruction variable, and the piano instruction variable.

For the Rhythm1 subtest, the percussion group ranked second in instrument comparison and in each of the secondary

variables except for private instruction, where percussion subjects achieved the lowest scores. For the Rhythm2 subtest, the trumpet group achieved the highest scores for the instrument comparison, and for each of the secondary variables, except the other music training variable. The percussion group achieved the highest Rhythm2 subtest scores for subjects who had received other music training or experience.

CHAPTER V
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to compare the melodic and rhythmic reading skills of trumpet, clarinet, and percussion players in select North Carolina high school band programs. A secondary research objective was to determine the effects of years of instruction (ranging from one to nine years), private instruction, private piano instruction, and other out-of-school music training or experience on melodic and rhythmic reading skills of the subjects as categorized by the three instrument groups. The secondary variables were investigated to determine possible differences in main effects; and to determine if there were interactions between each of the four variables and the instrument variable.

The main research objective for the study was to determine if there were significant differences in Music Achievement Test (MAT) scores between the three instrument groups. The subtests of the MAT, serving as a measure of the dependent variable, were treated independently; and four null hypotheses were employed in this study.

1. There is no significant difference in Pitch1 subtest mean scores between trumpet, clarinet, and percussion groups.
2. There is no significant difference in Pitch2 subtest mean scores between trumpet, clarinet, and percussion groups.
3. There is no significant difference in Rhythm1 subtest mean scores between trumpet, clarinet, and percussion groups.
4. There is no significant difference in Rhythm2 subtest mean scores between trumpet, clarinet, and percussion groups.

The secondary research objective was served by the following questions.

1. Will length of instruction on the principal instrument produce a significant difference in scores for any of the subtests when grouped by instrument?
2. Will private instruction on the principal instrument produce a significant difference in scores for any of the subtests when grouped by instrument?
3. Will private piano instruction produce a significant difference in scores for any of the subtests when grouped by instrument?
4. Will other music training or experience produce a significant difference in scores for any of the subtests when grouped by instrument?
5. Will there be significant interaction between any of the secondary variables and instrument?

Treatment of Null Hypotheses and Research Questions

Null hypotheses

Based on results of the univariate analysis of variance between instrument groups, there were significant

differences in mean scores for both the Pitch1 and Pitch 2 subtests. Therefore, null hypotheses 1 and 2 were rejected. Post hoc analyses on these subtests showed that the percussion group mean scores were significantly lower than the trumpet group. There was no significant difference in mean scores for the Rhythm1 and Rhythm2 subtests. Therefore, null hypotheses 3 and 4 were retained.

Research question 1

For the years of instruction variable, analyses showed significant differences in mean scores for the Pitch2, Rhythm1, and Rhythm2 subtests. Post hoc analyses on these subtests showed significant differences between the following comparisons: Pitch2--three and five years of instruction; Rhythm1--three and six years of instruction; and Rhythm2--three and six years/four and six years/three and five years of instruction.

Research questions 2, 3, & 4

For the private instruction variable, analyses showed a significant difference in scores for the Rhythm2 subtest only. The analyses for the private piano instruction variable showed significant differences in mean scores for each of the four subtests. For the other music training or experience variable, analyses showed significant differences in mean scores for the Pitch1, Rhythm1, and Rhythm2 subtests.

Research question 5

Pertaining to the question of interaction effects for each of the secondary variables, analyses for the private instruction variable showed significant interactions between private instruction and instrument for both Pitch1 and Pitch2 subtest scores. The analyses for the other secondary variables showed no significant interactions between those variables and instrument.

Discussion

Conclusions for this study were based on retention or rejection of the null hypotheses and treatment of the research questions. Although discussion of the test analyses included separate treatment of instrument categories, in keeping with the objectives of the study, primary attention was directed toward differences between the percussion group and the two wind instrument groups.

The four subtests of the MAT measured melodic and rhythmic music reading skills directly applicable to this study. The Pitch1 subtest measured auditory-visual pitch discrimination within a melody. The Pitch2 subtest measured pitch recognition--the ability to recognize direction and interval between two written notes. The Rhythm1 and Rhythm2 subtests measured auditory-visual rhythmic discrimination within a melody. Both Rhythm subtests were the same in structure but vary in difficulty; the Rhythm2 subtest measuring more advanced rhythmic discrimination skills.

Melodic and rhythmic music reading skills of the three instrument groups were measured by the four subtests. Test score means showed that the trumpet group was superior to the percussion and clarinet groups in pitch discrimination and recognition skills, and rhythmic discrimination skills. Test scores of the percussion group were consistently lower than the trumpet group in each of the four subtests. When compared to the clarinet group, test score means indicated that the percussion group was superior in pitch discrimination and rhythmic discrimination skills.

Test score means showed that subjects with five years of instruction were superior in pitch recognition skills to subjects with three years of instruction. In addition, test score means indicated the following differences according to years of instruction: subjects with six years of instruction were superior in rhythmic discrimination skills to subjects with three and four years of instruction; and subjects with five years of instruction were superior in rhythmic discrimination skills to subjects with three years of instruction. All band programs in the sample started instruction in the sixth grade. Considering the significant comparisons, ranging from three years to six years of instruction, the period from eighth grade through eleventh grade is apparently influential in improving pitch recognition skills and rhythmic reading skills. The data do not permit conclusive statements on possible influences;

however, possible factors may include motivation and maturation of the students, or influences of transition from middle school to high school.

According to test score means, private instruction improved the pitch discrimination and pitch recognition skills of trumpet and clarinet students. However, percussion students who received private instruction achieved lower scores in pitch discrimination and recognition skills than percussion players who had not received private instruction. Possible factors may include an emphasis of only rhythmic development in private percussion instruction; or the data provided by the subjects pertaining to private instruction may not have revealed adequate knowledge about the length of private study.

Test score means showed that private piano instruction improved the pitch discrimination and pitch recognition skills for each of the three instrument groups. In addition, private piano instruction improved the rhythmic discrimination skills for each group. Similarly, according to test score means, other music training or experience improved the pitch discrimination and pitch recognition skills, and the rhythmic discrimination skills for each of the three instrument groups.

Implications of the Study

This study provided empirical evidence of music achievement for trumpet, clarinet, and percussion players as

measured by the four MAT subtests. Of specific importance was comparisons of music reading skills of percussion students with trumpet and clarinet students. Results, however, placed the clarinet group closer to the percussion group than the trumpet group in music reading skills. Normally, considering typical beginning band instruction methods, expectations of music reading skills would parallel the clarinet group with the trumpet group. It is noted that for some variables in this study, the clarinet group was statistically different in music reading scores than the trumpet group. After verification of data accuracy, it was determined that these inconsistencies cannot be explained. Therefore, comparisons of most importance to the researcher emerged as those between the trumpet and percussion groups.

Results of this study showed that percussion students scored lower in pitch discrimination, pitch recognition, and rhythmic discrimination than trumpet students in the sample. This finding supports the speculation that percussion students may not be as well prepared in basic music reading skills when compared with trumpet students. The identification of specific causes was not an objective of this study, however, it is clear that percussion students have not achieved music reading skills to the extent of trumpet players. Speculation on the causes of these differences may relate to: 1) less attention focused on percussion players from band directors, 2) insufficient

knowledge of percussion pedagogical techniques by band directors, and 3) less demanding exercises in band method books.

The differences in music reading skills identified in this study may indicate a need for reassessment of educational methods and techniques for percussion students. Considering the current demands on percussionists to possess multiple instrument skills, it may be paramount for band directors to develop modes of instruction that effectively prepare percussion students in music reading skills and performance capabilities on multiple percussion instruments.

Analyses of the secondary variables provided further confirmation of differences in music reading scores between percussion, trumpet, and clarinet students. Private instruction apparently did not improve the pitch discrimination and recognition scores of percussion students, as shown by the lower scores of percussion students who had received private instruction. Conversely, trumpet and clarinet students who received private instruction achieved higher scores in pitch discrimination and recognition. This tendency may be the result of the content of private instruction for percussion students; implying possible absence of melodic reading skill development.

Private piano instruction improved the pitch discrimination and recognition, and rhythm discrimination scores of percussion students in this study. However, they were consistently lower in the four subtest scores than trumpet students who had received private piano instruction. As with private percussion instruction, speculation on content in private piano instruction may be dependent on emphasis of melodic and rhythmic reading skill development.

The other music training or experience variable included activities such as music camp, solo and ensemble festivals, all-district or all-state band, and community groups. Percussion students in this study who indicated other music training or experience achieved higher scores in pitch and rhythmic discrimination than percussion students who did not receive other music training or experience. The activities mentioned may vary the emphasis on melodic and rhythmic music reading development. Therefore, speculation on viable activities for percussion students may be dependent on instructional emphasis.

Recommendations for Further Research

Considering the many ambiguities surrounding the clarinet group scores and the effects of the secondary variables on the scores, subsequent research should examine other instrumental comparisons to verify the position of clarinet players in the context of music reading skills. The conclusions from this study were limited to

generalizations about melodic and rhythmic reading skills of high school band students from the North Central Region of North Carolina. Replication of this study at the high school level of instruction in other regions of other states may provide further knowledge of percussion instruction methods within the context of instrumental music education.

Replication of this study using different instrument groups to compare with the percussion group is recommended. Other instrumental students will provide additional data on comparisons of music reading skills applied to instrumental ensembles.

Further research should include investigations and studies of private instruction for percussion students, and instructional content of middle and high school instrumental programs. Studying the instructional emphasis in these programs may provide further data concerning instructional strategies for music reading skill development.

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APPENDIX A
LETTER TO BAND DIRECTORS

LETTER TO BAND DIRECTORS

4901 Liberty Road
Greensboro, NC 27406
Date

Band Director
School
Address
City, State, Zip

Dear Band Director:

The purpose of this letter is to request your participation in a research study involving high school band students. I am a graduate music student in the doctoral program at the University of North Carolina at Greensboro. The topic of my dissertation is the comparison of melodic and rhythmic music reading skills among percussionists, clarinet players, and trumpet players in select North Carolina high schools. The results of this comparison may provide documented insight into the questions and concerns of music educators regarding the achievement of percussion students in select instrumental programs in North Carolina.

Schools randomly were selected for the study based on the establishment of certain criteria. A standardized test will be used to measure the students' melodic and rhythmic reading skills. The test can be administered at your convenience, during the regular class period that you have rehearsal. Total testing time, including the completion of a questionnaire and the reading of instructions, is approximately fifty minutes (one class period).

Test results and analysis of the data will refer only to the groups of instruments that were tested. No student names will be used in any part of the analysis or the interpretation of the data. I appreciate your favorable consideration to participate in this research study. If you have any questions concerning the project, I will be calling you to confirm your decision and to clarify any information you may need. I look forward to talking with you.

Sincerely,

Mark R. Wheeler
(919) 674-9848

APPENDIX B

PERMISSION TO COPY MUSIC ACHIEVEMENT TEST RECORDINGS

Boston University

School for the Arts
855 Commonwealth Avenue
Boston, Massachusetts 02215



July 30, 1991


Mark R. Wheeler
4901 Liberty Road
Greensboro, NC 27406

Dear Mr. Wheeler:

I am in receipt of your letter dated July 24, 1991 and agree to your request to use the Music Achievement Test material for your doctoral dissertation. You may make a cassette tape of parts of the recording as long as the original is referenced.

I look forward to reading your thesis when it is complete.

Sincerely yours,


Richard J. Colwell
Chair, Music Education

RJC/ms

APPENDIX C
STUDENT QUESTIONNAIRE

STUDENT QUESTIONNAIRE

Please respond to the following questions as accurately as possible. The information you supply will be an important part of this research study and confidentiality is ensured. Your name is only for initial identification of questionnaire returns and will not be used in association with any answers. Thank you for your participation.

1. High school name: will be filled in by researcher
2. Your name: _____
3. Grade level: freshman sophomore junior senior
(Circle one)
4. The instrument you currently play: Check one category
TRUMPET: _____
CLARINET: _____
PERCUSSION: _____
If you are a percussion player, rank the following categories according to experience. Use the chart to the right of the categories.
Snare drum _____ 1= most experience(principal)
Timpani _____ 2= some experience
Xylo./Bells _____ 3= limited experience
Bass drum _____ 4= seldom experience
Accessories _____ 5= no experience
6. The number of years you have played this instrument in a band program: _____
The number of years you have played this instrument outside a band program: _____
7. Do you take private lessons on this instrument? _____
If yes, how long have you been taking these private lessons? 1 year _____
2 years _____
3 years _____
4 years _____
5 years or more _____
8. Have you ever taken private piano lessons? _____.
If yes, how many years have you taken piano lessons? _____
Do you take piano lessons currently? _____.
9. Have you had any other music instruction or formal training that would include reading music?

Thank you for this information.

APPENDIX D

MUSIC ACHIEVEMENT TEST EXPLANATIONS AND DIRECTIONS

MUSIC ACHIEVEMENT TEST EXPLANATIONS AND DIRECTIONS

This is an achievement test in music. The test will measure how well you are able to hear and identify correct melodic and rhythmic notation.

The test will be given from this record, and you must stay with the record at all times. If some questions are difficult, or go too fast, make a guess and go on to the next question. To make your answers in this test, fill in the answer blank you have decided is correct. Be sure to fill in the space completely. If you make a mistake, fill in the new answer blank and then erase your old answer, but do not go back and change answers after the next question has begun. If there is more than one correct answer to the question, fill in every blank you have decided is correct.

Sample questions will be given before each section of the test. Answer these examples to make sure that you understand what you are to do. There will be time after each question for you to fill in your answer blank and prepare for the next question. Remember, do not go back and change answers after the next question has begun.

Note: These directions were followed by the starting of the tape, with recorded directions for each of the subtests.