

THE EFFECTS OF LEARNING SONGS BY EAR IN MULTIPLE KEYS  
ON PITCH ACCURACY AND ATTITUDES OF BAND STUDENTS  
(AURAL TRANSPOSITION)

by

ANN MARIE MUSCO

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Dr. Harry E. Price, Chair of the Examining Committee

11/27/06

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Date

Committee in Charge:      Dr. Harry E. Price, Chair  
   Dr. Michael D. Bullis  
   Dr. Phyllis M. Paul  
   Dr. Steve Vacchi

Accepted by:

---

Dean of the Graduate School


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## An Abstract of the Dissertation of

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Approved: \_\_\_\_\_

 Dr. Harry E. Price

The main purpose of the study was to examine the effects of learning songs by ear in multiple keys on skills in playing by ear and sight-reading. Secondary purposes of the study were to explore the effects of instruction on student attitudes, and to consider differential effects due to music aptitude. Students were brass and woodwind musicians ( $N = 28$ ) in grades 7–8, placed in one of two instructional groups according to music aptitude, instrument, and music background.

Time for instruction was three 20-minute lessons per week for four weeks. Students in the experimental group learned songs by ear in the keys of Bb, Db, and G

concert, while students in the contact-control group practiced technical exercises in those same keys. Before and after instruction, students performed a well-known melody by ear in the keys of Bb, Db, and G concert, as well as a short etude in each of the three keys. Two adjudicators listened to recorded performances and evaluated pitch accuracy.

To assess the effects of instruction on performance, repeated-measures ANOVAs considered the variables of group, time, and key. The experimental group improved significantly in playing by ear in the keys of Db and G concert,  $p < .001$ , but not in Bb. The contact-control group did not improve significantly in playing by ear in any of the keys. Both groups improved significantly in sight-reading in all three keys,  $p < .001$ . Analyses of qualitative and quantitative data from a researcher-authored attitude survey indicated that students in the experimental group perceived significant improvement in the new keys of Db and G, while students in the contact-control group did not perceive improvement. There were no statistically significant effects of music aptitude on performance achievement or attitude. Whether this was because the sample sizes were too small for the detection of effects, or whether there were no significant effects, is not known. The results of the study suggest that learning songs by ear may benefit student musicians.

## CURRICULUM VITAE

NAME OF AUTHOR: Ann Marie Musco

### SCHOOLS ATTENDED:

University of Oregon, Eugene, Oregon  
University of Calgary, Calgary, Alberta, Canada  
University of Hartford, Hartt School of Music, Hartford, Connecticut  
Indiana University, Bloomington, Indiana

### DEGREES AWARDED:

Doctor of Musical Arts in Music Education, 2006, University of Oregon  
Diploma of Fine Arts in Conducting, 2002, University of Calgary  
Master of Music Education, 1990, University of Hartford  
Bachelor of Music Education, 1985, Indiana University

### AREAS OF SPECIAL INTEREST:

Music Reading  
Band Pedagogy  
Teacher Education  
Wind Literature  
Conducting

### PROFESSIONAL EXPERIENCE:

Assistant Professor of Music, University of Alaska Fairbanks, 2004–present  
Graduate Teaching Assistant, University of Oregon, Eugene, 2000–2004  
Associate Faculty, Allan Hancock College, Santa Maria, California, 1999–2000  
Band Director, Grades 4–12, Piedmont Unified School District, California,  
1995–1998

## PROFESSIONAL EXPERIENCE (CONTINUED):

Music Teacher, Grades 1–7, San Lorenzo Unified School District, California,  
1991–1995

Graduate Assistant, University of Hartford, Connecticut, 1988–1990

Music Teacher, Grades 7–8, Claremont Junior High School, New Hampshire,  
1987–1988

Band Director, Grades 5–6, Garden City Unified School District, Kansas,  
1985–1987

## GRANTS, AWARDS AND HONORS:

Music Education Fellowship, Northwestern University, Summer 1997

## PUBLICATIONS:

Musco, A. M. (2005). Classroom motivation and management go hand in hand. *Alaska Music Educators Journal*, 44(1), 34–35.

Musco, A. M. (2005, January). Just watch the baton during these warm-ups. *The Instrumentalist*, 59, 12–14.

Musco, A. M. (2005). [Review of the book *Vaughan Williams essays*]. *Music Educators Journal*, 91(3), 62–63.

Musco, A. M. (2004). Tone quality in band: A review of selected literature. *Journal of Band Research*, 40, 66–79.

Musco, A. M. (2003). [Review of the book *Composers on composing for band*]. *Music Educators Journal*, 90(1), 65.

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to my mother

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## CHAPTER I

### INTRODUCTION

In their book *The Teaching of Instrumental Music*, Colwell and Goolsby (1992) described a typical rehearsal scenario: An ensemble performs scales and other warm-up exercises with a high degree of technical accuracy, but sight-reading activities are beset by numerous pitch errors due to lack of awareness of key signatures and tonalities. Considering the extended amount of time spent practicing technical exercises in an effort to ameliorate note accuracy, the number of pitch errors is disappointing. The director patiently corrects performance errors, and improvements are forthcoming, yet the entire process seems to begin again with each new composition. Reflecting upon this scenario, it may be that many students are unable to transfer to the literature skills learned and practiced in warm-ups and technical exercises. Colwell and Goolsby advised that one possible solution to this problem is to “teach more music through music” rather than exercises or “pure technique” (p.123).

Learning and transposing songs by ear is an activity that qualifies as teaching music through music. In playing songs by ear, students become aware of tonality and learn to perform within the appropriate key signature. This study compared learning songs by ear and aural transposition, a musical approach to learning to perform in new keys, with the traditional approach of practicing scales and other technical exercises.

## Background of the Problem

Pedagogues in instrumental music have voiced their concerns that beginning method books teach music reading as a motor reaction to visual symbols on the page rather than as an aural-visual-motor skill (Gordon, 2003; Grunow, 2005; Grunow, Gordon, & Azzara, 2001; Schleuter, 1997). Popular published band method books that would be considered traditional in terms of their approach to music reading and the introduction of new pitches include *Standard of Excellence* (Pearson, 1993), *Essential Elements 2000* (Lautzenheiser et al., 1999), *Accent on Achievement* (O'Reilly & Williams, 2001), and *The Yamaha Advantage* (Feldstein & Clark, 2001). In these traditional band method books, each new pitch on the music staff is associated with a musical letter name and a corresponding finger, slide, or mallet position.

Among the four method books, there is little or no attention to aural-skills development, playing by ear, or rote-note approaches to teaching music reading. Moreover, in my opinion, there is inadequate attention to tonal context as new pitches are presented and insufficient repetition of newly learned notes. For example, consider the introduction of the note low-Ab concert. Of the four method books, three use the new pitch first in an exercise, rather than a major-key song that might be more quickly and vividly audiated. *Essential Elements 2000* uses the new pitch in two consecutive songs, but the first song is in Ab major and the next is in F minor. Only one book, *Standard of Excellence*, introduces the new pitch with two musical lines, the first an exercise and the next a song, that are in the same key, Ab major. Two books contrast the new pitch Ab with A-natural within the first three songs/exercises of music. Although there is no

music-specific research to suggest an optimal number of repetitions of a new fingering, Sanders (2004) concluded in his review of literature that three repetitions of a new task appears to be optimal, and that beginning students may need even more repetitions. None of the four method books offers three songs/exercises of the new pitch within a single tonal context before moving on to other concepts.

Schleuter (1997) warned that this approach to instrumental music performance results in “button pushers” who are unlikely to aurally comprehend the music they are performing. Thompson (2004) used the term “button pushers” to describe musicians in her study who were unable to hear inside their heads the music they were asked to sight-sing; only after instrumental performance were these musicians able to hear the pitches notated. Gordon (2003) and Grunow (2005) advocated the importance of audiation – “the hearing and comprehending in one’s mind the sound of music that is not or may never have been physically present” (Gordon, 2003, p. 361) – as fundamental to performance with understanding. Without audiation, using the correct fingerings when performing music from notation is analogous to typing prose without understanding the meaning of the text being typed. Audiation also enables musical prediction and anticipation, which are thought to facilitate accurate performance and sight-reading (Gaynor, 1995; Gordon, 2003; Grunow, 2005). A more basic concern may be that performers unable to hear the score do not recognize errors and, therefore, are not able to self-correct mistakes (Nuttall, 2004). These musicians need a great deal of teacher assistance when learning new music, as described in the opening scenario of this chapter.



In harmony with the views of Gordon (2003), Grunow (2005), Schleuter (1997), and others, Priest (1989) opined that for instrumental performance to be a musical experience with a musical result, performance must be preceded by an aural image. Further, he advocated that all musical performance should be regarded as “by ear,” including when notation is involved, so that an aural basis of musicianship is maintained, a wider view of performance is encouraged, and musicians might be more spontaneous in their music-making.

Mainwaring (1941) cautioned against teaching music reading as mechanical reaction to symbols on the page, or “the unfortunate tendency to teach the notation as the stimulus of an activity rather than as symbolic of sounds” (p. 211). Mainwaring (1951) later proposed that music reading involves three automatically functioning processes – sound, symbol, and action – that ideally occur synchronously. He noticed that many students possess excellent symbol-action skills but lacked sound-symbol and sound-action coordination.

Motor and visual/cognitive skills are the focus of development for students in the middle or high school band that spends many minutes of each rehearsal engaged in technical drill. Scales and other exercises seek to develop kinesthetic fluency as well as pitch accuracy. Pitch accuracy is developed further with knowledge of music theory, including key signatures. However, as suggested earlier in the scenario described by Colwell and Goolsby (1992), these skills may or may not transfer as new music literature is being learned.

## Rationale for the Study

Pedagogues such as Kodály (Choksy, 1981), Suzuki (1969), and Schleuter (1997) advised teaching music through music as much as possible, rather than technical drills and composed exercises. In developing music reading skills, Kodály-based instruction includes singing folk songs and Suzuki-based instruction includes performing classical masterpieces. Schleuter believed that familiar songs were the most effective musical material for beginning instrumentalists. He recommended singing songs before playing them and playing simple melodies at many different pitch levels. In this way, fingerings and range expansion are accomplished without additional material, and a musical reason exists for learning new fingerings.

An 18-week experimental study by Reimer (1944) (as cited in Duerksen, 1972) compared melody- and drills-based instruction in beginning instrumental music. Participants in the melody group selected tunes to practice; fingerings were introduced as needed and errors were corrected as they occurred. Participants in the drills group did not play melodies, as all instruction was limited to scales, drills, and exercises. The melody group covered more than twice as much material, performed more difficult music, achieved higher scores on a music listening test, and demonstrated more positive attitudes toward music instruction.

Dalby (1999) posited teaching familiar tunes by ear as among the most basic of strategies:

Singing and playing familiar tunes by ear are essential for developing the ability to connect audiation to the physical manipulation of the instrument. . . . Think of

tunes as musical stories, essential components of the aural/oral foundation upon which higher levels of audiation skill are built. Children who learn a large repertoire of stories as part of their early language learning are better prepared for formal instruction in reading. The same is true in music. . . . Encourage students to learn as many tunes as possible. Make tunes a part of grading or other incentive plans. . . . Any efforts you make in this regard will pay valuable dividends in the level of overall musicianship that your students will ultimately achieve. (p. 23)

Many educators have advised learning songs by ear in beginning instrumental music (e.g., Conway, 1997; Dalby, 1999; Martin, 2005), and some have also advocated aural transposition (Froseth, 1996; Grunow et al., 2001; Righter, 1945; Schleuter, 1997; Webster, 2000). Transposition of notated music is recommended by piano pedagogues such as Bastien (1973) and in piano texts such as those authored by Berkowitz (1975), Heerema (1984), Lindeman (1996), and Pace (1956). In band instruction, Righter was an early proponent of learning melodies by ear and transposition, reminding the reader that “song is the real basis of all music” (p. 196) and even suggesting ensemble improvisation of idiomatic accompaniment parts. Righter opined that such activities were both interesting and constructive and would “pay large dividends in both suspected and unsuspected directions” (pp. 43–44).

Although traditional beginning instrumental method books offer scant attention to playing by ear and rote-song instruction, two currently available series are exceptions: *Do It!* and *Jump Right In. Do It! Play in Band* (Froseth, 2000) lists nine familiar songs to be learned by ear without music notation and three familiar melodies to be played on a new

starting note (p. xv). The songs to be learned by ear are notated in the student book and accompanied in a “traditional” style; students are later asked to play the songs again, without consulting notation, in a different style. Other songs, such as *Down by the Station*, *Blues in F*, and *Cool Jazz*, are designed in a call-and-response format, and improvisation activities are included. The *Teacher’s Resource Edition* includes a list of songs suited for specific teaching purposes, but does not describe teaching procedures. The printing of song lyrics in the student books implies that singing is highly recommended. *Do It! Play Strings* (Froseth & Smith, 2003) and *Do It! Play Recorder* (Froseth, 1998) are similar in design and content to the band method. On page 23 of the recorder book, students learn the definition of aural transposition and there are blank staves for notating eight familiar tunes beginning on new starting pitches.

*Jump Right In: The Instrumental Series: For Winds and Percussion* (Grunow et al., 2001) includes notated tonal and rhythm patterns, four specially composed songs to teach the concepts of major-minor tonality and duple-triple meter, and 10 folk songs to be learned by ear and then read in notation. The *Teacher’s Guide* recommends general strategies – including copious “Dos and Do Nots” (p. 280) – for teaching students to sing the songs, although I did not find specific recommendations for making a transition from singing the songs to playing them on instruments. Vocal cues prompt students to begin singing in the appropriate tonality, meter, and style. For each song notated in the book, there are bass lines that can be taught by ear and harmony lines to be read in notation. Recommended enrichment activities include playing familiar songs in different keys, playing familiar major songs in minor tonality, playing familiar songs in a different

meter, improvising harmony parts to familiar songs, and notating familiar and unfamiliar songs. The *Solo Books* with compact disc recordings contain additional melodies that are designed to be learned by ear in multiple keys and later read from notation in the original key. The strings (Grunow, Gordon, & Martin, 2002) and recorder (Grunow, Gordon, & Azzara, 1998) methods are similar in scope and content.

Although only a few beginning band method books feature substantial play-by-ear activities, other published resources are available to encourage playing by ear. Froseth's *Ear-to-Hand Foundation Studies* (1994) features sequential exercises performed by ear in all keys, with recorded accompaniments. Among numerous publications by Aebersold for teaching jazz style and improvisation are *Minor Blues in All Keys* (1993) and *Giant Steps: Six Challenging Jazz Songs in All 12 Keys* (1995). Although all of these resources promote playing by ear, they are unlikely to be used in a concert band setting.

A resource directly related to the topic of learning songs by ear in multiple keys that might be used in band rehearsals is *Studies in Aural Transposition* by Froseth (1996), which was designed to assist musicians in improving ears-hands coordination. The author viewed ear-to-hand activities as “applied ear training,” or a “performance-based form of aural music dictation. . . of immense utility” (p. 2). Froseth suggested that ear-to-hand coordination is an important skill for musicians and one that is essential for creative musicianship. Without ear-to-hand coordination, the music reader is “eye-bound” (p. 2) and can only respond to visual symbols with kinesthetic actions rather than aural understanding. The workbook includes a self-assessment of skills followed by songs for skill development. The opening measures of 30 well known melodies are notated

beginning on various starting pitches suitable for band or string instruments. The musician chooses a convenient starting pitch and reads the musical excerpt in one key. After learning the excerpt, the musician transposes it to four other starting pitches. For a song in major tonality, the flutist would read the excerpt in Bb and then transpose it to the keys of Eb, Ab, C, and F concert. Next, the musician is advised to play the excerpt starting on all possible pitches; the sequence of starting pitches, around the circle of fifths, is notated in the book on a music staff. The concept is that now the musician is ready to learn and perform the entire song by ear in all keys.

In addition to pedagogues who recommend learning songs by ear and some published resources to support such instruction, descriptive studies have documented significant, positive relationships between the skills of playing by ear and playing from music notation. Luce (1965) observed a moderate correlation between high school band students' skills in playing by ear and sight-reading,  $r = .50$ . For students in grades 7–12, McPherson (1995–1996) reported an even higher correlation of  $r = .67$ , and between playing by ear and performing rehearsed music,  $r = .64$ . Among beginning band students, Bernhard (2004) documented a correlation of  $r = .67$  for playing by ear and sight-reading.

Playing songs by ear is also recommended by MENC – The National Association for Music Education. The National Standards for Music include Achievement Standard 2d for grades 5–8: “Students play by ear simple melodies on a melodic instrument” (MENC Committee on Performance Standards, 1996, p. 69). This recommendation is in accord with the philosophy espoused by earlier proposals in music education, such as the Manhattanville Music Curriculum Project, or MMCP, which outlined four categories of

musical objectives including knowledge, skills, attitudes, and aesthetics (Thomas, 1970). The MMCP sequenced skill objectives in priority order: aural/listening, dexterous/performance, and translative/notational. A well-rounded instrumental curriculum that includes learning songs by ear and then later reading those songs in notation would qualify as such a curriculum.

Although the National Standards and educational experts suggest learning songs by ear in band, and music publications exist that support playing songs by ear, there is a dearth of empirical evidence measuring the effects of such instruction. Brown (1990) implemented a pilot rote-song curriculum in a college aural-skills class and found that melodic echoes, songs by ear, and aural transposition contributed to student achievement in playing melodic patterns and songs by ear. Other studies have included rote-song instruction among several independent variables (e.g., Bernhard, 2004; Dunlap, 1989; Haston, 2004; McDonald, 1991), but none have examined the specific effects of rote-song instruction on music reading in intermediate-level band classes. Consequently, the present study was proposed.

#### Statement of Purpose

This study compared instruction that emphasized learning songs by ear in multiple keys with instruction that emphasized playing from notation technical exercises in those same keys. The primary purpose of the study was to investigate the effects of song-by-ear instruction on pitch accuracy in song-by-ear and sight-reading performance. Secondary purposes of the study were to examine student attitudes toward instruction and to explore any differential effects of music aptitude.

### Research Questions

1. Are there any effects on song-by-ear achievement due to type of instruction?
2. Are there any effects on sight-reading achievement due to type of instruction?
3. Are there any effects on student attitudes due to type of instruction?
4. Are there any differential effects among students of low, moderate, and high aptitude on performance achievement or attitudes due to type of instruction?

### Scope and Delimitations of the Study

The study employed a pre-posttest control-group design. Participants included seventh- and eighth-grade wind musicians in band, most of whom had played their instruments for three or four years. Students in a single band class were placed in one of two groups according to music aptitude, instrument, and music background, and the groups were randomly assigned to either the experimental or contact-control treatment.

Measures included a test of music aptitude (*Advanced Measures of Music Audiation*, by Gordon, 1989), a researcher-authored *Student Background Survey* (SBS), pre- and postinstruction song-by-ear performance tests in three keys, pre- and postinstruction sight-reading performance tests in the same keys, and a researcher-authored *Student Attitude Inventory* (SAI). The independent variables of the study were type of instruction and music aptitude. The dependent variables of the study were pitch accuracy in playing by ear, pitch accuracy in sight-reading, and student attitudes toward instruction. Analysis of variance tests considered the possibility of interaction effects due to music aptitude (Research Question 4). Follow-up analyses documented the effects of



instruction on playing a familiar song by ear (Research Question 1), sight-reading (Research Question 2), and student attitudes (Research Question 3).

The time for instruction was brief (four hours over the span of one month) so that the study could be completed within the quarter-term grading period and without encroaching upon concert season. This decision helped to minimize potential threats to experimental control, but lessened the likelihood of affecting significant gains in performance skills.

Because the study measured only pitch accuracy, the playing tests did not take into consideration tone, intonation, rhythm, or other musical factors. There was no opportunity for remedial instruction, and neither treatment addressed the concepts of range development or tone production. Student performances were scored from audio recordings. Therefore, performance test scores reflected students' pitch production rather than knowledge of fingerings or slide positions.

In an effort to isolate the variable of rote-song instruction, the treatment protocol did not include singing, solfège exercises, melodic-pattern training, reading or writing of the learned songs, harmonization of the learned songs, or other activities that would usually complement such an instructional approach. Further, the teachers showed the students how to play the new pitches on their instruments without the aid of any visual fingering/position chart, as would be typical in a traditional rehearsal.

The band classes available to participate in the study were limited to those within driving distance of the researcher's home and school, which pragmatically included three middle schools. One school employed a part-time educator whose schedule did not

permit participation and the other employed a first-year teacher, thus leaving one possible school site. The class selected to participate had only 29 wind musicians in the group. For the purposes of statistical analysis, this was a relatively small sample. Further, the findings of the study might not apply to other instruments, students of different ages, students with fewer or more years of instrumental study, other student populations beyond the class involved in the study, or private-lesson instruction.

See Table 1 for definitions of terms used in the study.

Table 1: *Definition of Terms*

Term	Definition
Audiation	“Hearing and comprehending in one’s mind the sound of music that is not or may never have been physically present” (Gordon, 2003, p. 361). Walters (1989) used this working definition: “the hearing of sounds not before the ear at the moment, through recall, prediction, or conception” (p. 5).
Aural transposition	Performing a melody or musical passage by ear (without notation) beginning on a new starting pitch.
By ear	Music performed without notation at the time of performance (Priest, 1989) and learned aurally without the aid of notation (McPherson, 2005).
Key	In the broadest sense of the word, loyalty to a specific tonic or pitch class (Apel, 1969). The <i>keys</i> practiced in this experiment were Bb concert, Db concert, and G concert. In this document, these major keys may be termed simply Bb, Db, and G.
Music aptitude	Based on the <i>Merriam-Webster Online Dictionary</i> (Merriam-Webster Online Dictionary, 2005–2006a) definition, one’s capacity to learn or achieve in music. Gordon (2003), the author of the aptitude measure used in this study, believes that “audiation is fundamental to music aptitude” (p. 46).

Table 1 (Continued): *Definition of Terms*

Term	Definition
Notational audiation	“The audiation of what is seen in music notation without the aid of physical sound” (Gordon, 2003, p. 373).
Pitch accuracy	Accuracy of pitch without consideration of rhythm or intonation. In some literature, “note accuracy” is the term of choice.
Rote instruction	According to the <i>New Oxford American Dictionary Online</i> , instruction focused on the “habitual repetition of something to be learned” (McKean, 2005).
Rote song	Any song learned through repetition and, in this study, without the assistance of music notation and with minimal use of tonal solfège or scale-degree numbers.
Sight-reading	Performing from a score without any prior practice or instruction of that score; i.e., <i>prima vista</i> (Gabrielsson, 1999).
Song	Traditionally, a song is composed of words with music ( <i>Merriam-Webster Online Dictionary</i> , 2005–2006b). In this study, however, songs will include common melodies taught without text and performed on an instrument.
Tonal audiation	Audiating the tonal syntax of music, which is the orderly arrangement of pitches that establish the tonality of a passage or piece of music (based on Gordon, 2003).
Tonality	In the broadest sense of the word, “loyalty to a tonic” or resting tone (Apel, 1969, p. 855) and the organization of all tones and harmonies in relation to that tonic or resting tone. Tonality includes major, minor, dorian, and so on (Gordon, 2003). The <i>tonality</i> used in this experiment was major.
Tonic pattern	Two to four pitches of equal duration within the tonic triad that are heard as a sequential whole (based on Gordon, 2003).

## CHAPTER II

### REVIEW OF LITERATURE

This study examined the effects of rote-song instruction in instrumental music. Therefore, the literature review begins with a brief overview of selected instrumental methodologies that recommend rote instruction: *Pedagogical Foundations*. The underlying theory of the study is that improved aural perception facilitates accurate music reading. Consequently, the chapter continues with research on the topic of *Music Reading and Aural Perception*. The experimental instruction, playing by ear, is an aural approach to music learning, and so discussions of *Playing by Ear* and *Aural-Based Instructional Strategies* are next.

Literature on the theme of *Teaching Music Through Music* includes two studies closely related to the present research topic. One study compared warm-ups based on musical excerpts with instruction employing musical exercises (Price, Blanton, & Parrish, 1998) and another documented the effects of a pilot rote-song curriculum in a college aural-skills piano laboratory (Brown, 1990). The review of literature concludes with a summary of recommended best practices for teaching songs by ear, as well as rehearsal strategies applicable to both the experimental and traditional instructional treatments: *Rote-Song Teaching Procedures* and *Practice and Rehearsal*.

## Rote Instruction: Pedagogical Foundations

This study proposed that rote-song instruction might be as beneficial in instrumental music as it has been in elementary general music. America's first public school music educator, Lowell Mason, taught students to sing songs by rote before introducing music notation. Soon thereafter, music educators were engaged in a lively debate of teaching methods. Volk (1993) offered an excellent overview of the history of the rote-note controversy. Although rote learning in instrumental music makes some teachers anxious that music reading skills are not being developed (Kendall, 1966), the major music learning pedagogies of Orff, Kodály, Suzuki, and Gordon all advise sound-before-sign rote instruction where aural/oral activities precede music reading. Although there have been few applications of the Orff and Kodály approaches in instrumental music, the Suzuki and Gordon methodologies have influenced instrumental music instruction.

### *Suzuki's Mother Tongue Approach*

Shinichi Suzuki (1969) observed that children of all abilities learn to speak their native language with great facility at a very young age. The Suzuki approach encourages young children to develop musical skills as they would develop language skills. Listening to models (usually recordings) and imitative learning of a large body of carefully sequenced classical repertoire are emphasized. Music reading is taught after a substantial amount of repertoire is learned, typically through a process of associating what has been learned by ear with what is seen on the page (Layne, 1974). This is believed to make for a more meaningful first exposure to music reading. Many Suzuki teachers employ a book

such as *Note Reading for Violin* (Suzuki, 1985), which teaches the sound, the symbol, and the name of the symbol, in that order (Kuzmich, 1991). Games, flashcards, and other activities also help the student to learn the mechanics of notation (Wood, 2001).

Kendall (1966) was an early advocate of the Suzuki approach. He acknowledged and assuaged worries about the Suzuki emphasis on imitative learning, which in America was viewed as “a sinful, if pleasurable, pastime” (p. 14) that might impede the development of the eye-brain-finger relationship. Suzuki proponents, however, believe that just as learning to talk does not interfere with learning to read, learning to play by ear does not interfere with learning to read music notation (American Suzuki Institute–West, 1973). Further, it is suggested that in playing from memory and delaying music reading, the ear is developed, aural memory is challenged, and the musician is free to concentrate on performance fundamentals such as posture, technique, and musicality.

### *Gordon’s Music Learning Theory*

Edwin Gordon (2003) conceived his Music Learning Theory as “an explanation of how we learn when we learn music” (p. 26). In music learning, as in language learning, the child progresses from imitation to understanding, and discrimination/rote learning precedes inference learning. Music Learning Theory focuses on the development of audiation skills and encourages a whole-part-whole approach to music instruction. Students learn a repertoire of songs by ear through listening, moving, and singing activities. These experiences provide the readiness for tonal and rhythm pattern instruction, which is the “part” in whole-part-whole learning. In band, the later “whole” in whole-part-whole learning includes performance of music literature.

Pattern instruction begins at the aural/oral skill level, where students listen to and imitate patterns on a neutral syllable. At the verbal-association skill level, students apply tonal and rhythm syllables to the patterns learned in order to better remember and discriminate them. Pattern instruction continues through the partial synthesis, symbolic association, and composite synthesis levels of discrimination learning. As familiar and unfamiliar patterns are audiated, read, and performed in succession, students are engaged in the first level of inference learning, termed generalization. Inference learning also includes creative activities, such as improvisation, and theoretical understanding, which may include learning the letter names of notes, counting rhythm patterns, and explanations of key and time signatures.

*Concerns: Developing Musical Independence*

Presently, in instrumental classrooms throughout the country, students learn the letter names and time values of notes, the placement of pitches on the staff, and definitions of musical terms. Still, students ask their teachers, “How does this go?” To answer students’ questions, some teachers sing or perform a tricky passage of music while the students watch the notation. In the method book *Spotlight for Strings*, the authors recommend this type of listen-imitate-read process of association for beginning-level instruction (Gazda & Stoutamire, 1997). Students are satisfied that they are learning “how it goes,” but educators are frustrated that students continue to need teacher assistance and have yet to become independent readers. Excellence in sight-reading is not possible for those musicians who lack musical independence. The challenge for educators is the development of strategies that move students from imitative, teacher-dependent

learning to inferential, independent learning. Careful sequencing, moving from the familiar to the unfamiliar, and adequate repetition are critical for guiding students from rote learning to note reading.

Certainly, it should not be expected that any one pedagogical approach is a fail-safe method. Critics of the Suzuki approach point to Suzuki-trained string musicians who are successful in memorizing lengthy, complex repertoire through imitation but are unable to generalize what they have learned to reading other repertoire or to deeply understand (i.e., audiate) what they perform (Stamou, 2005). Some research studies examining Gordon's Music Learning Theory have supported the benefits of that model of instruction (Grutzmacher, 1987; McDonald, 1991), while others have indicated no statistically significant advantages (Grande, 1989; Liperote, 2004). Considering the vast body of research on rote-note instruction as a whole, however, numerous studies have demonstrated the effectiveness of rote-note instructional approaches in the early stages of learning an instrument (Bernhard, 2004; Dunlap, 1989; Glenn, 1999; Haston, 2004; Sperti, 1970). The present study examined rote learning in intermediate-level instrumental music, thus building upon research in beginning band instruction.

### Music Reading and Aural Perception

Hodges (1992) defined music reading as the process of converting the visual symbols of music notation into sound, whether conceived internally in the mind's ear or produced externally with the voice or another musical instrument. Research has indicated that both visual and aural perception of music notation are necessary for performing music from a score (Dodson, 1983). For some performers, visual perception initiates an



automatic motor response and some degree of performance fluency is achieved. Artist-musicians, however, deplore such mechanical performances, believing that the musician's aural/musical conception of the score is what distinguishes competent performances from inspired performances (Frederiksen, 1996). A more basic concern may be that performers unable to hear the score do not recognize errors and, therefore, are not able to self-correct mistakes (Nuttall, 2004).

That aural perception is a component attribute of skilled music reading is evident in the phenomenon of "proofreader's error," which occurs when a reader fails to recognize a small error in print, reading a pitch or rhythm that was intended rather than what is actually printed on the page. Wolf (1976) recounted what has since been termed the "Goldovsky experiment" (Sloboda, 1984, p. 232). Upon a student's apparently mistaken performance, piano pedagogue Goldovsky discovered a printing error in a well-known Brahms *Capriccio*. Goldovsky later challenged skilled readers to find the misprint, but even after multiple performances none of the musicians was able to locate the error without further hints. This suggests that strong aural and kinesthetic programming may work together in music performance from notation.

Sloboda (1976) asked pianists to sight-read musical excerpts in Baroque and Classical styles that contained intentional misprints and found that musicians "corrected" some of the misprints by playing notes that would have been written rather than the notes that were written. Among the unaltered notes, the error rate during first performances was 2.9%. Among the altered notes, the error rate was 38%. A second performance of the excerpts resulted in even more "corrections." Misplayed misprints were nearly always

substitutions of the original correct notes, suggesting that stylistic familiarity and tonal comprehension contributed to musical inferences during performance.

McPherson (1994) observed high school band students while they were sight-reading and noted that aural feedback seemed to motivate error corrections, particularly among performers who had failed to observe a new key signature. McPherson observed first performances of an etude in F concert: Among the students who mistakenly played the first Bb as a B-natural, 41% of musicians in the younger, less advanced group played Bb during the rest of the melody, while 82% of musicians in the older, more advanced group played Bb during the rest of the melody. Aural feedback enabled self-correction and was strengthened with age/time and skill level.

### Playing by Ear

Although the National Standards for Music (MENC, 1996) include playing by ear as an important educational objective, research on the topic is relatively scarce. Only a few studies have explored current practices or the relationship between playing by ear and other musical skills.

#### *Current Practices*

A survey in *Clavier* magazine ("How teachers view playing by ear," 1996) questioned "a representative sample" (p. 6) of its readers and found that 58% of respondents taught students to play by ear. Teachers reported incorporating melodic echoes, question-and-answer phrases, folk and familiar melodies, transposition exercises, and improvisation in piano lessons. Many teachers felt unskilled in playing by ear, while others struggled to find a balance of instructional activities within the time constraints of

a weekly lesson. Among the benefits noticed, teachers reported that “playing by ear develops musical playing, motivates creativity, facilitates playing by memory, and broadens appreciation for diverse compositional styles” (p. 7).

Desiring additional information about current practices in K–12 instrumental music, I conducted a survey in 2001. Participants were educators attending a regional conference of the MENC. The results of the survey were that 85% of respondents reported incorporating some type of rote instruction in their music classes. Although the interpretation of the survey is limited due to the small sample size ( $N = 26$ ) and convenience sampling procedures, the data provide some indication of current beliefs and practices. Of the 22 respondents who said they used rote strategies in their teaching, the most popular activities were playing rhythm patterns by ear, followed by playing tonal or melodic patterns by ear, followed by teaching songs by ear. Of the 4 respondents who did not employ any type of rote instruction in teaching, 3 felt it would hinder music reading and 2 said they had never really considered it. (Multiple responses were encouraged.) Shortness of teaching time, the need for a curriculum, and lack of confidence were other reasons cited. Still, all of these teachers believed that aural transposition had potential benefits, and one respondent wrote that aural transposition was a part of her personal practice routine.

All respondents, except 3 who neglected to answer this particular question, favored the idea of learning a familiar song by ear in multiple keys (Musco, 2001). The survey suggested six potential benefits of aural transposition and respondents circled any they believed might apply: improved note accuracy in prepared performances ( $n = 11$ ),

improved note accuracy in sight-reading ( $n = 10$ ), better attention to intonation ( $n = 13$ ), a good supplement to scales and arpeggios ( $n = 7$ ), for experience in keys not yet learned in notation ( $n = 7$ ), developing awareness of underlying harmonic structure ( $n = 6$ ).

Handwritten comments included beliefs that aural transposition would be a good way to learn new key signatures, develop instrumental facility (including finger pattern technique on string instruments), encourage improvisation, introduce transposition, or advance theoretical understanding. One respondent considered aural transposition an indication of “complete knowledge of a particular song,” one considered it “a generally good way to develop better listening skills,” and another claimed simply, “It’s fun!”

High school instrumentalists in Australia reported that their teachers rarely encouraged aural and creative forms of performance, but instead focused on technical exercises and performance literature (McPherson, 1997). Students developed their abilities to play by ear informally. McPherson identified three broad categories of cognitive strategies used by student musicians in attempting to play by ear. Nearly half of the students reported trying to sing the melody internally and match the sounds with notes on instruments (kinesthetic recall linked with sound). Other musicians attempted to sing the melody internally without any attempt at kinesthetic recall, and some employed mental or visual strategies independent of melodic internalization and kinesthetic recall. In a later investigation, McPherson (2005) interviewed younger band musicians. Although here the researcher grouped the strategies in five rather than three categories, the described strategies were similar to those reported by the high school musicians in the earlier study.

### *Skills Development*

As noted by McPherson (1997; 2005), skills in playing by ear may improve over time without formal instruction. Skills in playing by ear can also be improved with practice. Wilder (1988) measured the play-by-ear skills of college students who were assigned to either an experimental or control group for the programmed practice of melodic patterns. Musicians in the experimental group improved their abilities to play melodic patterns by ear significantly more than did students in the experimental group.

The primary purpose of a study by Delzell, Rohwer, and Ballard (1999) was to examine the relative difficulty of performing selected melodic patterns. Data were obtained for seventh- and tenth-grade wind musicians ( $N = 47$ ). At the time of the study, play-by-ear activities were not a regular component of their band instruction. Before the melodic playback test, a listening test confirmed that all participants had the requisite aural skills to perceive differences in patterns and a performance test verified that all students were familiar with the necessary fingerings. The results of the analyses demonstrated that major patterns were significantly easier than minor patterns and ascending patterns were significantly easier than descending patterns. Students tended to persist in using a familiar, although incorrect, fingering pattern during melodic repetitions in the less familiar keys. Other findings of the study included no significant differences in ability to play by ear due to length of instrumental study (two years or five years) or instrument played (brass or woodwind). The seventh graders also took a test of music aptitude. The analysis revealed moderate, positive relationships between Tonal Imagery

subtest scores on the *Musical Aptitude Profile* (Gordon, 1995) and student abilities to play by ear ( $r = .74$  for melody and  $r = .70$  for harmony).

### *Aural Training*

Earlier, I presented evidence that aural perception is a component skill of advanced music reading and understanding. A question arises, then, as to how skills in aural perception are acquired and if playing by ear might help to develop aural skills. Theory pedagogues including Brown (1990), Covington (1992), Karpinski (2000), and Thackray (1975) have considered this question and advised that playing by ear in college aural-skills classes may be beneficial. Karpinski recommended instrumental playback of aural stimuli because it connects aural-skills training directly to students' personal experiences, allowing musicians to utilize their "most highly developed musical voices" (p. 129). Further, playing by ear requires a "full spectrum of skills in the pitch domain" (p. 130). Thackray noted the value of playing by ear as "a tactile aid to visual and aural perception" and counseled learning through "real" music rather than "exercises" (p. 27).

Covington (1992) advocated that students ought to be able to represent heard and imagined sounds in both notation and performance. By integrating dictation and performance activities, all three modalities - the visual, the auditory, and the kinesthetic - are employed. Covington described her curriculum, where students listened to a well-known classical, folk, or patriotic theme; played the theme by ear on a familiar instrument; and then notated the melody on paper.

Wilder (1988) investigated the melodic ear-to-hand coordination skills of 67 first-semester college theory students. The data analysis revealed a correlation of  $r = .84$

between ear-to-hand coordination and a music theory placement exam, and  $r = .64$  between ear-to-hand coordination and aural music theory grades. Wilder found that ear-to-hand coordination, or the ability to imitate melodic patterns by ear on an instrument, was the most effective predictor of aural music theory grades.

### *Playing by Ear and Music Reading*

Intrigued by experts advising the important role of the ear in instrumental performance, Luce (1958; 1965) was curious to learn the relationship of playing by ear and sight-reading. Participants in his study were 98 high school band and orchestra musicians. Performance tests were composed for the study by the researcher. The sight-reading test included eight 8-measure examples requiring students to perform in three different keys. The play-by-ear test included six 2-measure musical examples in a common key. The stimuli were presented with a pipe organ model, and students were told the starting pitch of the examples. Each example was heard three times, with three opportunities for student response. In both tests, only pitch and rhythm were evaluated. The results of the data analysis indicated a significant, positive relationship of sight-reading with skills in playing by ear ( $r = .50, p < .01$ ). Students who had taken private lessons or accumulated more hours of participation in school ensembles tended to score higher on the play-by-ear test. On the basis of his findings, Luce advocated the inclusion of play-by-ear instruction in the instrumental music curriculum, stipulating that teachers ought not encourage rote learning in general, but rather the specific skill of playing by ear because of its potential to positively affect sight-reading abilities.

McPherson (1995b) espoused a “balanced” approach (p. 59) to instrumental music education that attends to the development of visual, aural, and creative performing skills. He considered visual skills to include performing rehearsed music and sight-reading because both involve reproducing music from written notation, aural skills to include playing from memory and playing by ear because both involve reproducing music without the aid of notation in performance, and creative skills to include improvisation.

McPherson’s study (1995–1996) involved 101 clarinet and trumpet musicians preparing for the Australian Music Examinations Board (AMEB). The musical requirements of the AMEB include both repertoire and technical studies. Scores of the AMEB served as an indication of ability to perform rehearsed music. The sight-reading test was the Watkins-Farnum Performance Scale (WFPS) (Watkins & Farnum, 1954). The play-by-ear test had two component parts: Students first played *Happy Birthday* and *For He’s a Jolly Good Fellow* two times each in two different keys, and then they listened to, performed, and aurally transposed five short melodies.

For the study sample as a whole, AMEB Levels III–VI, correlations between the five skills were significant and substantial. For students at AMEB Level III/IV, with participants closest in age to my study, significant correlations included playing by ear and sight-reading ( $r = .40$ ), playing by ear and performing rehearsed music ( $r = .31$ ), and sight-reading and performing rehearsed music ( $r = .30$ ). McPherson (1995–1996) also noted that these relationships tended to strengthen over time.



In a three-year longitudinal study involving elementary band students, McPherson (2005) continued his investigation of the skills of performing rehearsed music, sight-reading, playing from memory, playing by ear, and improvising. At the conclusion of the study, there were 97 students. For the play-by-ear test, children were told the starting pitch of a recorded melody, which they heard four times, and then they attempted to play it twice. The children improved significantly in all measures over the three years, even though the local school curriculum did not include specific attention to developing the aural and creative skills of performance. Students who scored low in playing by ear and sight-reading at the end of their first year of instruction were significantly more likely to discontinue their instrumental studies. These findings support the importance of developing both sight-reading and play-by-ear skills not only for their inherent musical value, but because students who develop these skills appear to be more likely to continue instruction past the initial stages of learning.

#### Aural-Based Instructional Strategies

This study proposed that aural performance activities in band, such as learning songs by ear, might positively affect skills in music reading. A variety of other aural-based instructional strategies have been researched: rote-note approaches, singing, modeling, pattern instruction, aural training, and aural warm-ups. The findings of those studies, taken together, suggest that aural-based instructional strategies are important in instrumental music education and can positively affect skills in music reading. Because my study attempted to isolate the variable of learning songs by ear, the experimental instruction excluded singing, pattern training, and the use of tonal syllables. However,

many pedagogues who have recommended teaching songs by ear in instrumental music suggest singing songs before playing them as well as preliminary call-and-response activities such as melodic playbacks and tonal pattern training with solfège (Grunow et al., 2001; Haston, 2004; Martin, 2005; McDonald, 1991); therefore, I will briefly review that literature. Next reviewed are two investigations described in somewhat more detail: a study by Delzell (1989) that examined the effects of discrimination training in band and a study by Blevins (1998) that incorporated aural warm-ups in band.

### *Rote-Note Instruction*

Learning songs by ear in unfamiliar keys and then later performing from notation in those keys – in other words, delayed note reading – was the task in the experimental group of my study. Researchers such as Glenn (1999), Grande (1989), McDonald (1991), and Sperti (1970) have measured the effects of delayed note reading in beginning instrumental music. Glenn and Grande found that delayed note reading did not impede student success on a sight-reading posttest. McDonald reported significant differences in note reading in favor of her rote-note group, but students were tested only on melodies sung and played in class. Sperti reported significant, positive differences between rote-note and traditional instruction in all performance measures: sight-reading, tone quality, finger dexterity, and musical phrasing. Glenn and McDonald observed that students receiving rote-note instruction demonstrated increased enthusiasm for music. In Glenn's study, 70% of students in the rote-note group continued instruction the following year, while only 32% of students in the note-instruction group continued participation.

Fifth-grade beginning band classes in a study by Dunlap (1989) received 14 weeks of instruction, including solmization of melodic patterns and singing rote songs for the experimental group. Students in the contact-control group performed melodic patterns and songs on their instruments, with no class singing activities. Although there were no differences between groups on a sight-reading posttest, singing did not hinder music-reading progress and may have long-term constructive effects not measured by the study.

Pattern instruction involves call-and-response imitations of short tonal, rhythm, or melodic patterns. Patterns are typically learned both vocally and instrumentally, first on a neutral syllable and then with tonal or rhythm solfège, and finally read in notation. Many believe that pattern training facilitates music learning (e.g., Bean, 1938; Gordon, 2003). MacKnight (1975), Grutzmacher (1987), and Gamble (1989) documented significant effects on music reading skills due to tonal pattern instruction.

Using 22 melodies from two popular beginning method books, Bernhard (2004) examined the effects of a sing-imitate-read sequence of instruction in sixth-grade band. The experimental group scored significantly higher than the contact-control group in the play-by-ear posttest. The two groups scored similarly in sight-reading. The results of the study suggest that rehearsal time devoted to singing activities did not encumber sight-reading achievement and may have contributed to developing skills in playing by ear. For the group as a whole, several significant relationships were noted: (a) playing by ear and tonal aptitude,  $r = .57$ ; (b) sight-reading and tonal aptitude,  $r = .37$ ; and (c) playing by ear and sight-reading,  $r = .67$ . The relationship between playing by ear and sight-reading is congruent with the findings of Luce (1965) and McPherson (1995–1996).

Haston (2004) also examined the effects of sound-before-sign instruction. Twenty fourth-grade participants were assigned to either an experimental (aural with modeling) or contact-control (visual) group, receiving after-school group instruction taught by the researcher for one hour each week for 11 weeks. Posttests included the WFPS as a measure of sight-reading achievement and the performance of a prepared line of music from a popular method book. Instruction for the aural with modeling group included learning songs by ear, melodic echoes, singing while fingering instruments, playing from printed music, and teacher models of tone quality, articulation, and other playing fundamentals. Instruction for the contact-control group emphasized visual learning, with students playing only from printed music. There was no singing, modeling, or playing by ear.

Although there were no statistically significant differences between groups (Haston, 2004), the aural with modeling group scored higher on both performance tasks. For each group and both groups combined, correlations between skills in sight-reading and performing rehearsed music were significant and positive. Haston concluded that instruction emphasizing aural learning with modeling did not hinder beginning instrumentalists in developing skills in performing from notation, and may have contributed toward performance success.

### *Melodic Patterns*

In order for students to learn songs by ear through imitation, as in this study, students must be able to discern differences in melodic patterns and compare their performance with a model song performance. Hence, skills in aural discrimination are

important. Delzell (1989) designed a taped program of instruction for teaching aural discrimination. Many of the musical examples were short excerpts from the method book being used for class instruction. The tapes included models followed by discriminator foils, which differed in only one way from their model counterparts, and call-and-response imitation cycles. The tapes taught the discrimination of tone quality, articulation, rhythm patterns, melodic patterns, and more.

Beginning band students ( $N = 43$ ) were randomly assigned to one of two groups for the 18-week study (Delzell, 1989). Time for regular instructional activities was slightly reduced for the experimental group, which listened to one discrimination tape at each lesson. Both groups improved significantly in skills in aural discrimination. There was no statistically significant difference between groups on the performance test, suggesting that time spent in listening activities did not slow performance progress. It is difficult to fully interpret the results of the performance test analysis, however, as the test included both performance from notation and by ear.

#### *Aural Warm-ups*

In my study, students in the contact-control group played traditional notation-based warm-ups from a technique book while students in the experimental group played songs by ear. Blevins (1998) also compared notation-based to aural warm-ups. Her aural warm-ups included melodic echoes, antiphonal scales, and scale variations as modeled by the band director. Participants were 54 eighth-graders in their second year of instruction in one intact band. Treatments took place over a 3-week period of instruction, using a multiple baseline research design. The first week was devoted to notated warm-ups and

the second to aural warm-ups. During the third week, there were two days of notated warm-ups followed by two days of aural warm-ups. The three dependent variables were musical effectiveness, student behavior, and student attitude. Musical effectiveness was evaluated by two experienced judges who listened to audio recordings of notated and aural warm-up periods and rated them based on tone quality, balance, blend, intonation, dynamics, and ensemble.

There was no statistically significant difference in ensemble performance or student behavior between the two warm-up conditions (Blevins, 1998); however, the length of treatment was very short and it is possible that significant differences might have resulted after more time. There were no significant differences between warm-up conditions based on student ratings of self-participation, section participation, band participation, and overall musical effectiveness.

A majority of students (63%) responded to the free response section of a survey (Blevins, 1998), which asked for the “best” and “worst” aspect of each kind of warm-up. Comments such as “too repetitive,” “too fast,” or “did not get everyone participating” were reported slightly more frequently for the notated warm-ups. The comment “took too long” was reported more frequently for the aural warm-ups (36%) compared to the notated warm-ups (13%). Since the warm-ups were always within one minute of each other in duration, Blevins theorized that the unfamiliarity of the aural warm-ups might have caused students to perceive that time for aural warm-ups had been extended. Further, more time for directions was necessary for the aural warm-ups, so perhaps overall playing time in aural tasks was less.

In the “best aspect” category of the student attitude survey (Blevins, 1998), more than one fifth of responses (22%) were positive reflections on the melodic echoes, which were unique to the aural warm-ups. Six percent of students reported that the aural warm-ups “made them think,” but no students said the notated warm-ups made them think. The only statistically significant difference reported by the researcher was related to the response “good and fun,” in favor of the aural warm-ups (24% compared to 5%). Although a novelty effect certainly could have been a factor, in the short-term, student attitudes toward the aural warm-ups were favorable.

### Teaching Music Through Music

A wealth of materials exist to assist educators in teaching musical concepts through band literature, such as the *Teaching Music Through Performance in Band* series (Miles, 1997). Other resources include the *Guides to Band Masterworks* (Garofalo, 1992, 1995). Each volume features several instructional units, each based on a significant and time-honored band composition. The philosophy of the series is that students can and should become knowledgeable about music as they become technically skilled performers. Therefore, in addition to accurate performance of individual parts, students might learn to sing, play, and identify by sound and sight the rhythms, scales, intervals, and chords found in the music. Garofalo’s workbooks reflect an approach to music education termed “comprehensive musicianship,” which is an interdisciplinary approach to music education that teaches music history, theory, structure, and style using school-appropriate literature (Mark, 1996; Mark & Gary, 1999).

Garofalo and Whaley (1979) compared a comprehensive approach to instruction with traditional band instruction. Two bands participated in the 5-week study, one as the experimental group and the other as the contact-control group. Both bands rehearsed *Spectrum*, a serial composition for electronic tape and band, by Herbert Bielawa. Experimental instruction included aural skills and rehearsal activities related to the compositional features of the score, listening to recordings of the work and other works in a similar style, and a twelve-tone composition project. Rehearsals for the contact-control group focused on traditional rehearsal procedures, with an emphasis on the short-range performance goal of skill acquisition necessary for a successful public performance.

Compared to the contact-control group, the experimental group scored significantly higher on a test of conceptual knowledge and a listening examination. Students retook these tests six weeks later. Correlations between the posttests and delayed posttests were high and significant, demonstrating that retention of learning was excellent. Adjudicators unanimously rated the postinstruction performance of the experimental group a I (Superior), while the contact-control group earned a II (Good). Although these data lend support for the comprehensive musicianship approach, the researchers cautioned that the results might not apply to other band classes or compositions.

Comprehensive musicianship advocates teaching musical concepts through music literature rather than isolated drills and exercises. A study by Price, Blanton, and Parrish (1998) sought to teach musical concepts through music literature excerpts rather than



warm-ups and exercises from a book. High school students ( $N = 69$ ) in two bands participated in 8 weeks of laboratory instruction that included two 20-minute sessions per week. Two band directors provided instruction, rotating between bands and treatment groups. After a brief scale and tuning warm-up, the excerpt group practiced passages from the literature that focused on “problems relating to the development of music reading proficiency” (p. 16): pitch patterns in a variety of keys, challenging articulations, exigent rhythms, and dynamic and other expression markings. The exercise group learned key awareness, articulations, rhythms, and dynamic and other expression markings through studies in the published books *Exercises for Ensemble Drill* (Fussell, 1939) and *Tipps for Bands* (Hovey & Walker, 1959).

The researchers (Price et al., 1998) confirmed that the two groups were statistically comparable in performance skills before instruction. After instruction, skills in sight-reading were measured using WFPS, skills in performing rehearsed music were measured using excerpts from the literature rehearsed in the two band classes (which had formed the basis for the warm-ups for the excerpt group), and student attitudes were assessed with a written survey. Although there was no statistically significant difference between groups in sight-reading improvement, both groups scored significantly higher in sight-reading after instruction. In the performance of rehearsed music, the test results significantly favored the experimental group. Analysis of a postinstruction participant attitude survey resulted in significant differences being found in favor of the excerpt group for lab enjoyment, lab helpfulness for improving personal playing skills, and lab helpfulness for improving the band’s performance at the concert.

The results of the study (Price et al., 1998) suggest that the use of separate materials to teach music performance skills may not always be necessary. Students preferred instruction that demonstrated an obvious connection with the literature and felt that such instruction was more effective than practicing isolated technical studies. As the authors state, “It may be that the answer lies not in exercise materials, but in the music itself in the hands of an innovative teacher. If the music is the reason for what we do, it would seem best to use it as our source of inspiration and teaching materials” (p. 19).

Brown (1990) was another researcher and educator who believed in teaching music concepts and performance skills through music, rather than exercises, whenever possible. In his semester-long pilot keyboard curriculum involving 11 volunteer college students, rote songs were the principal teaching materials. Performing melodic patterns by ear and transposing songs were additional instructional activities. Group singing using scale degree numbers and the use of a Wurlitzer illuminated keyboard were techniques for helping students learn the songs. Students played and harmonized the songs in the keys of C, F, and G major. Performances were graded in terms of correct notes, correct chords, and number of interruptions. The overall mean song score was 8.39 of 10 points. Out of 275 song performances, 87% of all performances were scored at or above the 70% mastery level and 74% were scored at or above the 80% mastery level. The success of Brown’s students suggests that a curriculum incorporating rote-song instruction and aural transposition might be efficacious in other settings such as intermediate-level band.

### Rote-Song Teaching Procedures

Experimental research related to teaching songs by ear has focused on rote-song instruction in elementary general music. Among the variables studied, research examining use of text (i.e., presence or absence of song lyrics) has been inconclusive. Also studied has been mode of presentation, such as whole-song versus echo-phrase strategies. Most textbooks for teachers describe both methods of instruction (Irwin & Nelson, 1986; Moomaw, 1984; Newman, 1995) and suggest that teachers consider the musical characteristics of the song, including song length and repeated phrases, when deciding how to teach a song through imitation and rote repetition. Harrison (1983) advised that children would benefit from listening to a song three times in its entirety, followed by a repeated-phrases approach where the children hear each phrase three times before singing back the individual phrases. Phrases are then combined and repeated until students are ready to sing the song in its entirety (Irwin & Nelson, 1986).

Gault (2004) reported empirical research supporting the benefits of a holistic, rather than segmented, approach to teaching songs. Research has shown that students with less experience or low music aptitude, however, seem to benefit from echoing phrases of a song. Most of the studies employed simple, four-measure songs (e.g., Gault, 2002; Klinger, Campbell, & Goolsby, 1998) and therefore the findings might not apply to longer songs such as the repertoire planned for this study. In practice, particularly in presenting longer songs, some combination of the whole-song and echo-phrase methods is probably optimal.

Expert opinion articles and textbooks in elementary general music offer ideas for motivating and retaining student interest during the song acquisition process (Irwin & Nelson, 1986; Newman, 1995; Waddell, 1989). Presenting a song effectively is much like successful public speaking, with expression, eye contact, and enthusiasm being important (Newman, 1995). Questions and activities can focus attention on specific musical attributes of the song or song phrases, help the teacher evaluate student understanding, and sustain interest through necessary multiple repetitions: “Pat the beat as I sing the song for you.” “How many times do you hear the opening motive?” “What is the form of the song?” “As I sing, clap on the first beat of each phrase.” “Draw the shape of this song in the air as you sing silently.” For retention, students will need multiple opportunities to perform a newly learned song. After a song is learned, practice variation is beneficial (Newman, 1995; Waddell, 1989). Songs can be performed loud or soft, staccato or legato, fast or slow. Songs can also be performed in a call-and-response format, or by smaller ensembles of students with others listening, evaluating, or engaged in some kind of seated movement activity.

A 1997 study (Moore, Brotons, Fyk, & Castillo) examined accuracy of singing among children ages 6–9 from five countries. Children ( $N = 600$ ) sang an unfamiliar song and performances were evaluated with respect to accuracy of pitch, tonality, contour, and rhythm. Rhythm scores were highest, followed by scores in contour and then pitch. (The authors did not report where tonality scores ranked.) These results may suggest an effective sequence of song instruction, where attention to rhythm and melodic contour precedes matching pitches. Another finding was that children often repeated their own

mistakes. For nearly half of all tasks (45%), children's first attempt at repetition was the most accurate, while the success rates for trials 2 and 3 were 27% and 28%, respectively.

Suggestions for teaching songs by ear in instrumental music are scant and sometimes vague, often describing how to teach the song vocally and then assuming the students will simply and automatically transfer their vocal skills to an instrument. *Do It! Play in Band* (Froseth, 2000) offers no specific recommendations for teaching a song vocally or instrumentally. *Jump Right In: The Instrumental Series* (Grunow et al., 2001) recommends that the teacher establish the tonality, key, tempo, and meter; "teach the song by rote" (p. 278); and then have the students perform the song by ear.

Norman (2005) advises a whole-part-whole method. After several informal hearings, Norman has his students listen one final time to the whole song, echo-sing the phrases, and then echo-sing the entire song. After vocal review, students echo-play the phrases and then echo-play the entire song. Martin (2005) advocates adding rhythmic movement and checking to be certain students are audiating resting tone, but all initial presentations are of the entire song. After students learn the song vocally, the teacher can add accompaniment, teach the song lyrics, or teach the bass line. Finally, students perform the song on instruments.

The procedures employed by McDonald (1991) in her study for teaching songs by ear on recorder to young children included preliminary instruction involving tonal and rhythm patterns. Before performing each phrase on instruments, students echo-sang each phrase on a neutral syllable and then added tonal solfège.

### *Applications to This Study*

From my review of literature, I learned specific strategies for teaching songs by ear through imitation and rote repetition. As a result, the rote-song lessons were sequenced to include an initial motivator, whole-song presentations, continuing phrase-by-phrase presentations with instrumental playback, and an instrumental performance of the song followed by varied repetitions. Texts and articles suggested strategies for initial motivation as well as questions and movement activities in order to direct student attention to structural features of songs. Music Learning Theory (Gordon, 2003) implies that continuing presentations include separate tonal and rhythm learning activities. Research in instrumental practice suggested varied follow-up performances of songs: changing dynamics, rhythms, articulations, or instrumentation.

Moore et al. (1997) reported that children were successful first in performing the rhythm of the song, then the melodic contour, and finally the exact pitches. Karpinski (2000), who viewed instrumental playback as a form of aural melodic dictation, included awareness of melodic contour as a prerequisite skill for playing or notating the exact pitches of a song. Therefore, although no pedagogues in instrumental music have specifically recommended a focus on melodic contour before instrumental performance, I made a special effort to include such activities in the lesson plans.

Learning that children often repeat initial mistakes in consequent performances (Moore et al., 1997), I realized the importance of offering guidance before the first instrumental playback of each phrase so that students would be more likely to succeed in performing accurately. Strategies included having the group match the starting pitch of

the phrase, discussion of melodic contour, deciding if the phrase moved by steps or skips, and sometimes even matching each pitch of the phrase before playing it in rhythm.

### Practice and Rehearsal

Research in music education, music psychology, and motor-skills learning has suggested practice habits and strategies for instrumental performers that might be effective in an ensemble rehearsal setting, and which further guided planning for instruction in this study. Literature has examined scheduling and organizational strategies for practice, as well as specific techniques – such as repetition, variation, slow practice, and part practice – that are used by successful musicians.

#### *Time and Scheduling*

In my study, the variable of time for practice was finite. Moreover, we neither encouraged nor discouraged home practice. Owing to the apparent benefits of distributed versus massed practice (Hallam, 1997b; Schleuter & Schleuter, 1988; Zdzinski, 1991), instruction was spaced across a month-long treatment period. Turner (1998) and Sanders (2004) discussed blocked and random schedules in music as well as degrees of contextual interference. When one task is practiced repeatedly, as in a blocked schedule, interference is low; when tasks are intermingled, as in a random schedule, interference is higher. A serial schedule is somewhere between these two extremes, combining the predictability of blocked practice with the nonrepetitiveness of random practice. One type of serial schedule would be practicing several different skills in the same order each time (Turner, 1998) such as scales around the circle of fifths. Although low levels of contextual

interference appear to facilitate initial skill acquisition, high levels of contextual interference appear to increase skill retention and transfer (Schmidt & Lee, 2005).

For piano students learning to perform in a new key, Bachus (in Bachus, Rock, Torkelson, & Morelock, 2005) recommends focusing on a key of the week, with students practicing technical exercises such as scales and arpeggios in the new key. Students also transpose selected technical exercises notated in a popular piano book, and learn a piece of literature in the new key. A band curriculum could be similarly organized using a book such as *Technique Through Performance* (Erickson, 1993), with a page of technical exercises on the left-hand side of the book and a full-band arrangement on the right side.

### *Repetition and Variation*

Varying the practice of a task introduces contextual interference and enhances retention, as long as contextual interference is moderately but not extremely high. Adding dynamics, changing articulations, or altering rhythms in the performance of a rote song or technical exercise are examples of practice variation. Whether practice involves varied repetitions of a task or a single task repeated many times exactly, repetition of some kind is necessary for learning. Sanders (2004) reported that three repetitions of a task is usually optimal, although the necessary number of repetitions for an individual musician depends on student aptitude as well as the task to be learned.

Turner (1998) reminded that active processing during learning is preferred: Mindless repetition typically does not enhance performance, whereas problem-solving and contemplation usually do enhance performance. Based on research, Hallam (1997b) suggested that variable practice may be most beneficial for the long-term development of



technical skills, but for improvement of performance on a specific composition, it may be advantageous to practice the work exactly as it will be performed.

A recent study examined variable practice in band (Schallock, 2004). Two intact seventh-grade classes participated in the study. The 15 etudes rehearsed by the variable-practice group included the five etudes rehearsed by the constant-practice group plus two variations of each etude. There were five performance posttests, including two tests of skill acquisition, immediately following treatment; two tests of skill retention, approximately 30 days following treatment; and a sight-reading test of skill transfer. There were no significant differences between groups in performance achievement due to practice condition, and caution is warranted in any attempt to generalize results because of the small sample size.

### *Slow and Part Practice*

Practicing a tricky passage slowly and then gradually speeding up the tempo is a common strategy in self-reports of musicians (Brittin, 2006, April; Harnischmacher, 1997). Nearly half of the professional musicians surveyed by Hallam (1997a) described repetitious practice working up from an initially slow tempo. Progressive-speed practice acknowledges a ubiquitous phenomenon in motor behavior (referenced in Schmidt & Lee, 2005) that is known as the speed-accuracy trade-off. Owing to a dearth of experimental research on slow practice in music, literature reviews in music have focused on studies examining nonperformance motor skills, which have shown mixed effects. Sanders (2004) concluded that slow practice was beneficial “as long as the progression

does not become so slow that it is perceived as a different motor program” (p. 19), while Zdzinski (1991) was circumspect.

Cecconi-Roberts (2001) examined the effects of criterion-speed practice, progressive-speed practice, physical practice, and silent practice. Participants were seventh-grade woodwind players ( $N = 80$ ) with approximately 2.5 years of playing experience. Students sight-read an etude, practiced according to instructions, and then again performed the etude, which was scored in the categories of note/pitch accuracy, rhythm accuracy, articulation accuracy, consistency of tempo, and adherence to a metronome. Students were randomly assigned to one of five practice conditions: playing aloud with a consistent tempo, playing aloud with a gradually increasing practice tempo, silently fingering with a consistent tempo, silently fingering with a gradually increasing practice tempo, and free practice. The analysis revealed no significant differences among practice conditions except in the category of note accuracy, where free practice was the most effective of the five strategies. The researcher acknowledged that asking students to adopt an unfamiliar practice strategy for a short testing session may have been beyond their comprehension or abilities, thus affecting the interpretation of the study.

Part practice among expert musicians has been documented by Brittin (2006, April) and Hallam (1997b). After his review of literature, Sanders (2004) recommended breaking a task into component parts, particularly for complex motor programs or sequences. Research has suggested that the efficacy of part practice depends on the nature of the task, whether serial or continuous (Schmidt & Lee, 2005). If one considers music

performance to be a serial task comprising the execution of musical patterns in succession, part practice should be an effective strategy.

### *Applications to this Study*

From the review of literature, I concluded that scales and other technical drills are important for developing instrumental proficiency. I also learned that focused practice in a single new key should aid in skill acquisition, but that I ought to structure follow-up rehearsals to include an intermingling of tasks in the three keys under study. In the practice of technical exercises, as in repeated performances of songs learned by ear, surveys and experimental studies have suggested the efficacy of a variety of practice techniques: slow to fast practice; part practice, such as isolating tricky measures or passages; and varied repetition, such as changing dynamics, rhythms, or articulations. A perusal of the lesson plans for this study will confirm that we used a multiplicity of research-based rehearsal strategies.

### Summary

Rote-note teaching strategies have been in existence since the dawn of music education (Volk, 1993). The pedagogical approaches of Suzuki (1969) and Gordon (2003) recommend that students learn a repertoire of music through imitation and rote repetition before commencing music reading. Playing by ear requires skills in aural perception, which are believed to contribute to skilled music reading (Dodson, 1983; Sloboda, 1978; Wolf, 1976). Theory pedagogues have recommended playing by ear for developing aural skills in college ear-training classes (Brown, 1990; Covington, 1992; Karpinski, 2000; Thackray, 1975).

Educators have advised teaching songs by ear to students in beginning band (Conway, 1997; Dalby, 1999; Martin, 2005; Righter, 1945; Schleuter, 1997). *Do It! Play in Band* (Froseth, 2000) and *Jump Right In: The Instrumental Series: For Winds and Percussion* (Grunow et al., 2001) are band methods that advocate learning a repertoire of songs by ear in multiple keys. Playing by ear, including simple familiar melodies, is also recommended by MENC (1996) in the National Standards for Music Education.

A variety of studies have measured the effects of aural-based instructional strategies for teaching music reading in beginning instrumental music. Researchers have found that rote-note instruction has not impeded initial acquisition of reading skills (Bernhard, 2004; Glenn, 1999; Grande, 1989; Haston, 2004; McDonald, 1991; Sperti, 1970), but the long-term effects of listen-imitate-read methods have not been documented. Singing (Bernhard, 2004; Dunlap, 1989) and pattern instruction (Gamble, 1989; Grutzmacher, 1987; MacKnight, 1975) are other aural-based strategies that are known to prepare students for successful instrumental performance. Most of these studies employed two or more critical independent variables, such as singing and rote-song instruction (Bernhard, 2004), solmization and rote-song instruction (Dunlap, 1989), modeling and rote-song instruction (Haston, 2004), or melodic echoes and rote-song instruction (Brown, 1990). Therefore, it is difficult to ascertain the specific effects of learning songs by ear.

The present study suggests rote songs as an aural warm-up activity in band. Blevins (1998) found traditional warm-ups and aural-based warm-ups to be rated equally

successful as measured by ensemble performances. Future research might evaluate the effects of aural warm-ups on individual student performance skills.

Learning songs by ear in multiple keys as an introduction to playing in new keys would enable more teaching of music through music rather than isolated technical exercises. Price, Blanton, and Parrish (1998) found ensemble warm-ups based on excerpts from band literature as effective as exercises from published technique books for affecting students' skills in sight-reading and more effective for learning the literature.

Researchers including Luce (1965), McPherson (1995–1996), and Bernhard (2004) have offered evidence that the skill of playing by ear is correlated with the ability to perform music from notation. No published survey, however, has documented the practice of learning songs by ear in band. Because experimental studies have failed to isolate the activity of playing songs by ear as an independent variable, whether developing skills in playing songs by ear will result in improved skills in music reading is unknown. Further, experimental studies related to rote-song instruction in band have focused on beginning- rather than intermediate-level instruction. Consequently, the present study appeared to be a needed contribution to instrumental music pedagogy.

## CHAPTER III

### METHODOLOGY

The investigation comprised a pilot study during the spring months of 2005 followed by the main study during the fall months of that same year. In keeping with the requirements for research at the University of Oregon, the Office for Protection of Human Subjects on that campus approved the research protocol for the pilot and main studies. Participating students signed forms of assent, and guardians of involved students gave written consent for their children's participation. The principals and school district also gave documented permission for the study. For the main study, the instructors gave formal permission for the videotaping of lessons. See Appendix A for student and parent permission forms related to human subjects compliance.

#### Pilot Study

##### *Purpose and Description*

Performance measures were authored by the researcher and pilot tested prior to commencement of the main study. The purposes of the pilot were to (a) fine-tune the testing and scoring procedures, (b) confirm the six etudes as being of approximately the same level of performance difficulty or rewrite them as necessary, and (c) determine inter-rater reliability.

Ten seventh- and eighth-grade wind instrumentalists at a secondary school (grades 7–12) in Alaska volunteered for the pilot. The school was a different school in town than the middle school for the main study. Flute, clarinet, alto saxophone, trumpet, horn, and trombone were the instruments tested in the pilot. The musical instruments tested in the pilot were the same as those tested in the main study, excepting horn, which was heard in the pilot but not the main study, and baritone saxophone and tuba, which were heard in the main study but not the pilot. This gave the judges experience adjudicating a variety of instruments on these specific performance tasks.

Each student played the song *Row, Row, Row Your Boat* by ear in Bb, Db, and G concert. Each student also sight-read six etudes, or two etudes in each of the three keys. The assignment of key with etude was such that, over the course of the pilot, all six etudes were tested several times in each of the keys. To minimize any potential effect of task order, some students played the three songs followed by the six etudes, while others played the six etudes followed by the three songs. The first song or etude played was always in Bb, followed by Db and then G, or G and then Db. The song-by-ear pre/posttest is in Appendix B and the sight-reading etudes are in Appendix C.

Four adjudicators plus the researcher scored the pilot performances. The adjudicators were current or former public school band directors, each with more than a decade of instrumental music teaching experience. Two adjudicators were retired secondary school band directors. Another had 6 years of teaching experience in middle school as well as several years of college teaching experience. The remaining two

adjudicators, including the researcher, were current university conductors with an average of 16 years of experience teaching public school bands, including middle school.

### *Testing Procedures*

The researcher served as the test proctor and recorded all performances. Before playing the songs, I sang *Row, Row, Row Your Boat* with each student until the student was able to sing the melody confidently or at least chant the rhythm with some indication of melodic contour. For each key, students were given an opportunity to perform aloud the melody on their instrument before being audio-recorded. The task was extremely challenging for most students, who needed frequent reminders to “keep playing even though it does not sound quite like what you are imagining.”

For each etude, students were given 30 seconds to practice silently the music notated on the page. The test proctor played on the piano the opening pitch of each etude and counted off four beats at quarter note equals 76. Students were encouraged to keep the tempo and to play the rhythms as written but were told that they were being scored only on pitch accuracy, or “correct notes.”

### *Scoring Procedures*

Pitch accuracy was the musical item of measurable interest, not rhythm or intonation. On the score sheets, adjudicators circled any pitches played incorrectly. I later tallied the number of pitches played correctly and then calculated the percentage score as a ratio of pitches played correctly divided by the total number of pitches in the musical example. Points were not deducted from the score for rhythm errors, or failure to keep



tempo unless the performance time exceeded 45 seconds in length. No student in either the pilot or main study exceeded the allotted performance time.

In addition to printed instructions, each adjudicator practiced scoring student performances in a training session with the researcher. Subsequent dialogue via telephone and email between the adjudicators and the researcher helped to clarify scoring procedures. Adjudicators were free to listen to each recording as many times as they wished.

Each performance of *Row, Row, Row Your Boat* was worth a maximum of 23 points. One point was possible for each pitch, with the exception of the eighth-note groupings on “merrily, merrily, merrily, merrily.” In 6/8 time, each group of three repeated eighth notes was worth only two points: one point for the first eighth note and one point for the remaining two eighth notes. Each etude performance was worth between 31 and 35 points. One point was possible for each pitch, with the exception of the repeated-pitch eighth notes, worth only one point for the two repeated pitches together. If a student misplayed one of any two repeated-pitch eighth notes, one half a point was deducted.

### *Etude Construction*

The performance tests focused on accuracy of pitch rather than rhythm. In order to facilitate this objective, the sight-reading etudes used only simple rhythms in 4/4 time. Three musical experts reviewed the researcher-constructed etudes until they were deemed of approximately equal performance difficulty in terms of rhythm, range, interval content,

harmony, and phrase construction. The expert reviewers were advised of these criteria for etude construction and completed an evaluation form. (See Appendix D.)

To help assure that the etudes would be of the same level of performance difficulty, the following rules of composition guided etude construction:

1. Number of pitches: Each 8-measure etude included 31–35 nonrepeated pitches.
2. Rhythm: The etudes used half, quarter, and paired-eighth notes.
3. Range: The etudes encompassed a range of a minor tenth, from the seventh degree of the scale below tonic to the ninth degree of the scale above tonic.
4. Interval content: The etudes comprised scalar melodic motion as well as small skips within the underlying I, IV, and V<sup>7</sup> harmonies.
5. Harmony and phrasing: The etudes included two 4-measure phrases. Each phrase had a final cadence on the tonic triad, and the second phrase had a harmonic rhythm identical to the first. The rate of harmonic change was one chord per measure for three of the four measures of each phrase, and two chords per measure on the other measure of the phrase. Each etude included a total of four or six beats over a subdominant triad. Three different harmonic plans were employed, with one plan for etudes Xa and Ya, one for Xb and Yb, and one for Xc and Yc.

### *Results of the Pilot*

*Testing and scoring procedures.* Interacting with students during pilot testing, it became evident that brass students unable to secure the opening pitch of an etude rarely regained pitch accuracy. Not only was this discouraging to the student, it magnified the already challenging task of the adjudicators. For the main study, the test proctor made

certain all students were able to match, on their instruments, the opening and concluding pitches of each etude before beginning the etude performance.

The researcher scored all etude performances and one third of the song-by-ear performances. The other adjudicators scored a random sample of the student performances: 60% of the etude performances, or two of each etude in every key; and one third of the song-by-ear performances, or one song of each student such that all three keys were represented approximately equally. Percentage scores of student performances in the pilot ranged from 0 to 100, testing adjudicator reliability on performances at both the low and high ends of the accuracy scale.

Adjudicators received written scoring instructions. (See Appendix E.) In short, the instructions were to “Circle any misplayed pitches.” The researcher later tallied the number of correct pitches. Dialogue with each adjudicator during the pilot helped to clarify what to do during various kinds of student performance errors so that, by the time of the main study, the adjudicators seemed to be feeling confident and consistent in their scoring. For example, students were reminded not to replay any pitches, but sometimes students made an “instant correction” to their performance. Adjudicators were free to mark those instances on the scoring sheet, with one half a point deducted for each quick correction, up to two points per performance. Sometimes students began the etude or a measure of it a second time. Generally there was no penalty for this, although adjudicators were advised to use their professional discretion in marking such repeats.

Given the qualifications of the adjudicators and the task at hand – the determination of correct versus incorrect pitches – the evaluation of student performance

skills would seem to have been a fairly easy matter. This did not prove so. A high percentage of student musicians demonstrated basic problems in tone production, often making it difficult for the listener to ascertain pitch. One adjudicator remarked on the difficulty of scoring student performances that were very much out-of-key or that failed to accurately perform the first few pitches. His comments are paraphrased here: I trust my accuracy when students play most of the etude correctly, but I feel unconfident when students miss multiple successive pitches or begin missed passages anew, for it is all too easy to lose one's sense of tonality and key. Nevertheless, as shown below in the statistical analysis of the pilot data, the adjudicators were able to achieve a high level of reliability.

*Statistical analysis.* Analysis of the pilot data sought to answer two research questions. First, was there an effect of judge? Second, was there an effect of etude? Four adjudicators plus the researcher listened to the pilot recordings. During the period of time of adjudication, however, one adjudicator was quite ill. Despite good efforts, the scores were in definite and haphazard disagreement with the scores of the other adjudicators. Consequently, the analysis included data from three adjudicators plus the researcher.

All computations for the pilot study were calculated using SAS® Version 9.1.3. The intra-class correlation coefficient, an overall measure of inter-rater reliability among the adjudicators, was  $ICC = .89$ . The pilot investigation concluded that inter-rater reliability was moderately high and there was no effect of judge.

Earlier, expert adjudicators had agreed that the etudes were of approximately the same level of musical difficulty. A statistical analysis of student test scores was

undertaken in order to further support or perhaps even controvert those expert opinions. The analysis employed only the scores of the researcher, which earlier were found to be consistent with the scores of the other adjudicators. The data included six etudes per student, two etudes in each key. With 10 participants, there were 60 observations total. Because this was a within-subjects design, where every participant was scored on every etude, the analysis employed a repeated-measures ANOVA.

There was a potential for interaction of key with etude. Ideally, a few participants might have performed each etude in Bb in order to examine the data without the possibility of a key with etude interaction. Since these data were not collected, the ANOVA looked for potential interactions. No interaction effect of key with etude was discovered,  $F(10, 33) = 1.47, p = .19$ . The next step of the analysis was to look for potential main effects. The analysis revealed no effect of etude,  $F(5, 43) = 0.20, p = .19$  but did find an effect of key,  $F(2, 18) = 8.32, p = .003$ . The pilot investigation concluded that the etudes played in Bb concert were of similar musical difficulty, the etudes played in Db concert were of similar musical difficulty, and the etudes played in G concert were of similar musical difficulty.

### Main Study

The primary purpose of the study was to compare learning songs by ear with performing exercises from notation on the performance achievement of brass and woodwind students. Secondary purposes of the study were to document the effects of type of instruction on student attitudes and to explore potential differential effects of music aptitude. The independent variables of the study included type of treatment and

level of music aptitude. The dependent variables were song-by-ear achievement, sight-reading achievement, and student attitudes toward instruction. Twelve 20-minute lessons comprised the treatments, which consisted of performing in the familiar key of Bb concert as well as the newly learned keys of Db and G. Measures included a researcher-authored *Student Background Survey* (SBS), Gordon's *Advanced Measures of Music Audiation* (1989), a researcher-authored *Student Attitude Inventory* (SAI), and researcher-authored song-by-ear and sight-reading performance achievement tests. See Appendices F and G for the questionnaires, and Appendices B and C for the performance tests.

### *Research Design*

The study employed a pre-posttest control-group experimental design. Students in one band class were matched on selected variables and then randomly assigned to either an experimental (songs) or contact-control (exercises) group. Type of treatment (experimental/songs or contact-control/exercises) was the manipulated independent variable of the study and level of aptitude (low, moderate, or high) was the nonmanipulated independent variable of the study. Thus, the study employed a 2 (type of instruction) x 3 (level of aptitude) factorial design.

### *Participants*

After human-subjects approval from the school district and the University of Oregon, and with the cooperation of the school band director, I explained the study to students in the selected band class and invited participation. Because the instructional activities were considered by the music teacher and principal to be part of the class curriculum, all students participated in the instructional activities but were given a choice

as to whether they wished to participate in the surveys and tests. During the recruiting process and in explaining the study, I emphasized that both types of instruction were expected to positively affect student achievement. Using language appropriate for middle school students, I also stressed the importance of treatment fidelity, including the admonition that students not discuss the practice activities with peers in the other treatment group.

Seventh- and eighth-grade wind musicians in one concert band at a middle school in Alaska volunteered to participate in the study. The school served 410 students, with a music program including two bands, one choir, one orchestra, and a before-school jazz band. During fall of 2005, approximately 45 students were enrolled in one of two bands at this middle school, with the more experienced band selected to participate in the study. At the time of the study, the ensemble was performing grade II band literature, the district curriculum emphasized music reading and performance skills, and concert band activities did not include playing by ear.

As reported on the school district website, during the 2005–2006 year the school population included the following ethnic mix of students: 72% White, 11% Alaska Native, 6% Asian, 6% Black, 4% Hispanic, and 2% American Indian. Upon inquiry with the Office of Program Planning and Management, I was able to confirm that the student volunteers for my study were slightly less diverse in background, with 82% White, 11% Asian, and 7% Hispanic students participating. During October, 2005, 36% of the students at this school qualified for free or reduced lunches.

Of 37 students in the band, 1 student declined to participate in the testing and surveys but participated in all instructional activities, and 1 student was unable to play for the duration of the study due to oral surgery. The 7 percussionists participated in one of the two treatment groups and completed all tests and surveys. Percussion data, however, were not included in the analyses. The reason for this decision was the limited music-reading background of the percussion students. Before treatment, none of the percussionists were comfortable performing music from notation in the key of B $\flat$  concert, and the experimental learning environment did not allow for remedial assistance. For the purposes of analysis, it was important that the two groups were as homogeneous as practical prior to the start of treatment, and there were too few percussion students to warrant a separate, meaningful statistical analysis. All factors considered, the sample for the study was  $N = 28$ .

Participants included 7 seventh-graders and 21 eighth-graders. Most students ( $n = 18$ ), having taken twice-weekly class lessons during grades 4–6 in elementary school, had three to four years of prior experience performing on their instruments. Of the 28 students, 3 had played for just one year, 7 for two years, 7 for three years, and 11 for four years ( $M = 2.93$ ,  $SD = 1.05$ ). Participants in the study played flute, clarinet, alto or baritone saxophone, trumpet, trombone, or tuba. To identify important information concerning students' prior musical experiences, such as private-lesson instruction and musical participation in ensembles outside of school, and to facilitate the assignment of students to groups, participants completed a researcher-authored *Student Background*



*Survey* (SBS). (See Appendix F.) Additional information on student background is presented in Chapter 4.

I placed students in one of two groups by means of a stratified random sampling procedure that resulted in two groups approximately matched in terms of music aptitude, instrument played, music background and experience, and classroom behavior. First, students were ranked according to music aptitude. Conceptually, the plan was to place the student with the highest aptitude in Group A, the next two students in Group B, the next two in Group A, and so on. Practically, I considered both instrument played and aptitude at the same time, alternating placing the highest ranked student of each main instrument category (flutes, clarinets, saxophones, trumpets, low brass, and percussion) in Group A or B and working from there. Although I had no theoretical hypothesis or prior research to suggest that the treatments might affect brass and woodwind musicians differently, I wanted a comparable instrumentation for the two groups in order to assure that instructional time specific to each instrument would be the same for both the experimental and contact-control treatments.

After the two groups were formed, I looked for any gross imbalance in music background and experience as identified on the SBS, paying particular attention to jazz band participation. To better balance the groups, I made two changes to the list, switching two pairs of students of like instruments who were approximately matched in terms of aptitude. Finally, I consulted with the cooperating band director and found a potential classroom management issue that could easily be avoided by switching two students without appearing to compromise consideration of aptitude. A coin toss determined that

Group A would be the experimental group ( $n = 13$ ) and Group B would be the contact-control group ( $n = 15$ ).

Because this research was a significant part of classroom instruction during the term, students earned a grade specifically related to study participation. Students were advised that excellent effort and positive participation in all practice activities would earn them an “A” grade for this unit of instruction, which counted as 15% of their final term grade. All students participated satisfactorily.

### *Instructors*

The cooperating band director, one of the two instructors for the study, was beginning her second year of teaching. Since the setting was a grades 7–8 middle school, the director had worked the year before with the eighth-grade students. I also participated as an instructor for the study. After more than a decade of public school teaching, including 5 years at the middle school level, I was beginning my second year of full-time university teaching.

To facilitate adherence to the treatment protocol, the two instructors met for two 75-minute sessions and one 45-minute session before the start of the school year. In addition to briefly examining the study surveys and tests, we reviewed in detail the lesson plans and teaching procedures for the two treatments. Considerable time was devoted to teaching each other several of the rote songs, working toward consistent presentation of new songs and understanding appropriate versus inappropriate teaching strategies. We also reviewed rehearsal techniques for the exercises group. Additionally, we discussed

general rehearsal procedures and pacing of instruction, including number of repetitions, small and large group reiterations, and speed and part practice.

### *Fidelity of Treatment*

Before each upcoming lesson, the instructors discussed the study in progress either in person, via email, or by telephone. Topics for discussion included pacing of the lessons, effectiveness of the teaching procedures, perceived student achievement, and classroom motivation and management.

Each teacher videotaped two lessons, one with each group, for documentation of treatment equivalence. The first songs lesson, with the researcher as instructor, was videotaped so that, early on in the study, the cooperating band director could review the tape and compare her teaching to the researcher's teaching. During the study, I reviewed all four videotapes, evaluating the tapes holistically for consistency of rehearsal techniques and pacing. Although time did not allow for outside evaluation of the videotapes, in my subjective analysis, implementation of treatment was as planned and the two instructors were similar in classroom demeanor and teaching procedures.

### *Procedures*

During the two weeks preceding treatment, students took the two performance pretests (the song-by-ear and sight-reading pretests) as well as a test of music aptitude, the *Advanced Measures of Music Audiation* (AMMA) by Gordon (1989). Students also completed the *Student Background Survey* (SBS) and page one of the *Student Attitude Inventory* (SAI).

Following the pretests but before the commencement of any treatment, the two instructional groups met together as a full ensemble to study the pitches necessary to perform in the three major keys of the study. Students reviewed or learned the letter names and fingerings/positions of the needed pitches, and their placement on the music staff, as well as the key signatures used for their instrument. See Appendix H for an outline of the full-band introductory lesson.

During Week 1 of treatment, both groups performed in the key of Bb; during Week 2, in Db; and during Week 3, in G. During Week 4, students worked in all three keys. The songs group, which due to time constraints had rushed through certain songs without an opportunity for mastery, worked toward memorization and improved pitch accuracy, and learned one remaining song in Bb. The exercises group worked to increase performance tempi. During the two weeks following treatment, students took the two performance posttests and completed the second and third pages of the SAI.

In sum, the treatment period consisted of 12 lessons, 3 lessons per week for 4 weeks, plus pretreatment activities the two weeks prior and posttreatment activities the two weeks following. The two treatment plans were parallel in construction. Table 2 highlights the weekly plan of activities.

Table 2: *Calendar*

PREINSTRUCTION ACTIVITIES				
		Performance Pretests SBS	Introductory Lesson: fingerings in Db and G	AMMA SAI
		DAY 1	DAY 2	DAY 3
WEEK 1	Songs	Patterns: Lines 1–2 Learn Unit 1 in Bb: <i>See the Little Ducklings</i> <i>Bells in the Steeple</i> <i>Twinkle, Twinkle</i>	Patterns: Lines 3–4 Review Unit 1 in Bb Learn Unit 2 in Bb: <i>Frère Jacques</i> <i>Lightly Row</i>	Learn Unit 3 in Bb: <i>Skip to My Lou</i> <i>Santy Maloney</i> <i>Alouette</i> (begin)
	Exercises	Patterns: Lines 1–2 Exercises in Bb	Patterns: Lines 3–4 Exercises in Bb	Exercises in Bb
WEEK 2	Both	in Db see Week 1 Day 1	in Db see Week 1 Day 2	in Db see Week 1 Day 3
WEEK 3	Both	in G see Week 1 Day 1	in G see Week 1 Day 2	in G see Week 1 Day 3
WEEK 4	Songs	<i>Alouette</i> in Bb <i>Irish Jig</i> in Bb Review Unit 1 in Db	Review songs in G	Review a selection of songs in Db and G
	Exercises	Short Review in Bb Review in Db	Review in G	Review in Db and G
POSTINSTRUCTION ACTIVITIES				
		Performance Posttests		SAI

### *Treatments*

Musicians in the experimental/songs group learned a repertoire of songs by ear in the key of Bb, and then in the keys of Db and G concert. Songs were presented using a piano model. Musicians in the experimental group also echo-played tonic patterns by ear. The experimental treatment included no music reading, which was included in the contact-control treatment. For details of the experimental treatment, see the appendices for song repertoire (Appendix I), tonic patterns (Appendix J), teaching procedures (Appendix K), and lesson plans (Appendix L).

Musicians in the contact-control/exercises group practiced from notation scale drills, arpeggios, interval studies, and other technical exercises in the key of Bb, and then in the keys of Db and G concert. Musicians in the contact-control group also practiced from notation tonic patterns; the patterns were the same as those performed aurally by the experimental group. The contact-control treatment included no specific aural training, as was included in the experimental treatment. For details of the contact-control treatment, see the appendices for the list of exercises (Appendix M), tonic patterns (Appendix N), teaching procedures (Appendix O), and lesson plans (Appendix P).

Db and G major were the keys selected for the study because they are of moderate difficulty for this age group. The keys were chosen in consultation with the school band director, who verified that the students had little or no exposure to those concert keys. With knowledge of the upcoming study, the band director avoided the major-key tonalities of Db and G in the literature performed by the ensemble during the first academic quarter of the school year.

Each treatment session began with a scale performed in whole notes at a tempo of quarter note equals approximately 60 beats per minute. During the first week of the treatment, the scale was Bb; during the second week it was Db; and during the third week it was G. On Day 1 of the fourth week, both groups warmed up with the Bb scale; on Day 2 they warmed up with the G scale; and on Day 3 they warmed up with the Db scale. On selected days, both groups played tonic patterns in order to gain facility in the various keys. Students in the experimental group played the patterns by ear. In a call-and-response format, the instructor played a series of three- and four-note tonic patterns on the piano two times and the students responded instrumentally. Students in the contact-control group played the patterns by sight, reading the patterns from notation two times. The length of time spent playing tonic patterns over the course of the four weeks was brief, approximately 15 minutes in total. The main purpose of playing tonic patterns was so that students learning the songs could be directed to choose from those pitches during song phrases comprising tonic-pattern skips. See either Appendix J or N for tonic patterns used in the study.

In selecting the song repertoire for the experimental group, an effort was made to include familiar melodies. Given that most students had never before played songs by ear, the curriculum emphasized songs that were largely conjunct in motion, with some small skips within the underlying primary harmonies (tonic, subdominant, and dominant chords). Listed in order of introduction, the songs were: *See the Little Ducklings*; *Bells in the Steeple*; *Twinkle, Twinkle Little Star*; *Frère Jacques*; *Lightly Row*; *Skip to My Lou*; *Santy Maloney*; *Alouette*; and *Irish Jig*. Due to limited instructional time but the necessity

of trying to learn at least a few songs encompassing the range of an octave, the final two songs, unfortunately, received less than adequate rehearsal time. The songs are notated in Appendix I.

In selecting materials for instruction with the contact-control group, an effort was made to utilize published resources and then to organize the selected exercises by key center. The researcher and cooperating band director considered the method and technique books available in the school library together with the objectives of the contact-control treatment, ultimately choosing *Standard of Excellence Book 3* (Pearson, 1996) and *I Recommend* (Ployhar, 1972). For the study, I selected scale drills, arpeggios, interval studies, and any exercise termed “Technique Study” or the equivalent thereof that were included in either book in any of the three keys. Each exercise was notated in Bb concert and the exercises were arranged in a logical order: the scale with arpeggio and thirds; five scale drills arranged in order of length and difficulty; a broken chord study; two additional scale studies, each with an interesting rhythmic twist; and the interval studies, beginning with thirds and progressing to an octave study. Then the exercises were transposed to Db and G concert. A booklet including the exercises in the three keys was printed for each student in the contact-control group. A list of exercises is given in Appendix M.

### *Measures*

Pretreatment data collection began with the AMMA (Gordon, 1989), a test of music aptitude, and the *Student Background Survey* (SBS). Individual participants also played a song-by-ear test in three keys and a sight-reading test in three keys. Finally, all



participants completed the first page of the *Student Attitude Inventory* (SAI), which asked them to reflect upon their recently recorded performance pretests. Posttreatment data collection included a song-by-ear test in three keys, which was the same song played on the pretests, and a sight-reading test in three keys, which included etudes similar in construction to those played on the pretests. Other posttreatment data included the final two pages of the SAI, which asked participants to reflect upon their performance posttests and their attitudes toward the treatment activities.

*Student Background Survey.* The researcher-authored SBS provided descriptive information about participants regarding band-instrument study, private-lesson instruction, piano and choir background, and experience in ensembles outside of the school concert band. Based on these data, students were matched and assigned to either Group A or Group B. I then randomly assigned Group A to be the experimental group and Group B to be the contact-control group. At the conclusion of the study, statistical analysis of the SBS was undertaken in order to verify group equivalence or document unintended pretreatment differences between groups. The analysis of the SBS data is reviewed in Chapter 4.

*Music aptitude.* To address Research Question 4, the study employed the *Advanced Measures of Music Audiation* (AMMA), authored by Gordon (1989). The AMMA asks students to compare pairs of short musical excerpts and decide if they are different tonally, different rhythmically, or the same. The test yields three scores for each student: tonal aptitude, rhythm aptitude, and total aptitude. The purpose of the aptitude assessment was twofold: First, to assure that the two groups were comparable in terms of

music aptitude, AMMA scores were considered in assigning students to groups; second, in an exploration of potential differential effects due to aptitude, the statistical analyses considered treatment by aptitude interactions.

A supplement to the test manual lists percentile conversions from raw scores and overviews the psychometrics as they apply to students in grades 7–8 (Gordon, 1990). The norms are based upon the test results of 1,533 students. The split-halves reliability of the two subtests and of the total test are listed as follows: tonal,  $r = .80$ ; rhythm,  $r = .83$ ; total,  $r = .85$ . Due to the construction of the test, the intercorrelation between the tonal and rhythm subtests is moderately high,  $r = .63$ , and the intercorrelations of the tonal and rhythm test scores with the total test score are high, at  $r = .95$  and  $r = .94$ , respectively. Consequently, I decided to consider total aptitude scores, rather than tonal aptitude scores, in the data analysis for the study.

Gordon (1987) identified high aptitude students as those with a total score at or above the 80<sup>th</sup> percentile and low aptitude students as those with a total score at or below the 20<sup>th</sup> percentile. Due to the typical self-selection process of instrumental music students, I anticipated that there would be a small number of participants in the low aptitude category as defined by Gordon, thus limiting meaningful statistical analysis. A perusal of the data confirmed a paucity of student scores at or below the 20<sup>th</sup> percentile, so the categories were redefined for this study. Students at or below the 40<sup>th</sup> percentile were considered low aptitude ( $n = 5$ ) and those at or above the 80<sup>th</sup> percentile were considered high aptitude ( $n = 8$ ). The remaining students ( $n = 15$ ) were considered to have moderate aptitude.

*Playing by ear.* To address Research Question 1, I designed a song-by-ear test to assess pre- and postinstruction performance skills in playing by ear. The song-by-ear pretest asked students to perform by ear the well known melody *Row, Row, Row Your Boat* in the keys of Bb, Db, and G. (See Appendix B.) During the pretest recording sessions, I sang the song with each student until he or she was able to sing the melody confidently or at least chant the rhythm with some indication of melodic contour. Nearly all students were familiar with the melody, requiring just one or two vocal performances of it. For each key, students were given an opportunity to perform the melody on their instruments before being audio-recorded. The posttest to measure song-by-ear achievement was identical to that used as the pretest, meaning that students again performed *Row, Row, Row Your Boat* in the keys of Bb, Db, and G.

*Sight-reading.* To address Research Question 2, I composed etudes to assess pre- and postinstruction performance skills in music reading/sight-reading. It should be noted that music reading, not sight-reading specifically, was the skill of interest in this study. Ideally, the music reading assessment of the study might have included both rehearsed and unrehearsed etudes. However, an extra set of etudes would have added several days to the testing calendar, resulting in an even longer time period between the conclusion of the instructional treatments and the conclusion of the posttesting. For that reason, I limited the scope of the music reading assessment to one type of etude.

I considered the possibility of having students play the etudes after teacher instruction, after at-home practice, or at sight. Were students to have rehearsed the etudes in band, there was no way of knowing if their tested performances were an indication of

personal performance success or memorized imitations of the interpretations of classmates seated nearby during instruction. Were students to have practiced the etudes at home, there was no guarantee that that they would have practiced the number of minutes requested. Given that research has shown that performance accuracy of rehearsed music is related largely to the length of time of spent in preparation (e.g., McPherson, 2005), I wanted to avoid that potential confounding variable if I was to include only one type of etude. Hence, considering the time constraints of the testing schedule and the potential for the confounding variable of at-home practice, I decided in favor of sight-read etudes for measuring students' skills in music reading.

The sight-reading pretest required students to perform from notation three 8-measure melodies (Xa, Xb, and Xc) in the keys of Bb, Db, and G. Each sight-reading etude was notated in all three major keys, and the etudes were transposed for students playing Bb clarinet, Eb alto and baritone saxophones, and Bb trumpet.

For each etude, students were given 30 seconds to practice silently. I made certain that students were able to match on their instruments the opening and closing pitches of the etude, and then I counted off four beats at quarter note equals 76 beats per minute. Students were encouraged to play the rhythms as written and to keep the tempo, but ultimately their scores were based on pitch accuracy regardless of rhythm, tempo, intonation, and other factors. For additional details about the scoring procedures, see the earlier section of this chapter titled *Pilot Study*. The posttest to measure sight-reading achievement was similar to that used as the pretest, meaning that etudes Ya, Yb, and Yc were of the same difficulty level as Xa, Xb, and Xc.

*Performance testing procedures.* The researcher served as the test proctor and recorded all performances. Students performed either the three songs or the three etudes first. For both the songs and the etudes, students played first in the key of Bb and then Db followed by G, or Bb and then G followed by Db. Considering the six tasks (three each, songs and etudes) and the three keys, 24 possibilities existed for the order a student might be asked to perform the performance pretests. The possibilities were arranged in a random order using the on-line number generator at *Research Randomizer* (Urbaniak & Plous, 2006). The 24 basic possibilities, and the randomized order of those possibilities, are listed in Appendix Q.

Students were assigned a confidential identification number. Student 1 played the pretests in the order listed as “Scenario 9” of Appendix Q, Student 2 played the pretests in the order listed as “Scenario 11,” and so on. Students 25–36 played the pretests in the same order as students 1–12. Because the percussion students were tested but not included in the data analysis, and because one student did not complete the posttesting, the study identification numbers ranged from 1–36 even though there were only 28 subjects in the final study analysis. The order of tasks performed by each student during the posttest was nearly the reverse of the order for the pretest. If the student played the songs first, now the student played the etudes first, or vice versa. If the student played etude Xb first in Bb, then Xa in Db and Xc in G, now the student played etude Yb first in Bb, followed by Ya in G and Yc in Db.

A hallway alcove near the band room was equipped to record individual students. The test proctor identified on the audio recording each student performance by number

and task: e.g., “Student 14, song in Db” or “Student 28, Ya in G.” Performances were recorded directly onto a laptop computer using CD Spin Doctor 2 from the Roxio Toast Titanium Version 6.0.3 software package for Macintosh. From the full recording tracks, talking and practicing were later deleted and separate sound files for each test were extracted and moved to iTunes, where compact disc recordings were created for each judge. For ease of adjudication, all task-by-key performances were grouped together (i.e., all of the songs in Db were arranged as a group, all of the Ya etudes in G were arranged as a group, and so on). To avoid possible preconceptions among adjudicators, pre- and posttests were randomly ordered within each task-by-key group of tracks, and adjudicators were not advised of the X versus Y labels for the pre- and posttest etudes.

*Student Attitude Inventory.* To address Research Question 3, I authored a survey to assess student attitudes toward the instructional treatments. After pretests but before instruction, students evaluated how easy or difficult they found the performance tasks and rated how well they felt they performed the pretests (Questions 1–12). I used a Likert-type scale that asked students to rate each of the performance tasks from 1 (easy) to 5 (difficult) and the quality of their recorded performances from 1 (poor) to 5 (excellent). After instruction, students evaluated how easy or difficult they found the performance tasks and rated how well they felt they performed the posttests (Questions 13–24). Students also rated the overall effectiveness and appeal of the instructional activities (Questions 25–31) and responded in writing to additional questions (Questions 32–36).

### *Plan for Analysis*

The first step of the analysis was to examine the data of the SBS and the AMMA using the Fisher exact test. Pending results confirming similarity of groups before instruction, I planned an investigation of inter-rater reliability. Inter-rater reliability for each performance task in each key was calculated as an ICC value using ANOVA with group as a fixed effect. With inter-rater reliability adequately high, the ANOVAs for the play-by-ear and sight-reading data were justified in considering the factors of group (songs or exercises), time (pre- versus posttest), key (Bb, Db, or G.), and aptitude (low, moderate, or high).

The next step of the analysis was to look for any interaction of music aptitude with playing by ear and sight-reading (Research Question 4). Due to small cell sizes, I predicted that there would be no interaction effect of aptitude. Finding no effect of aptitude and seeking to focus the report on the primary research questions (i.e., Research Questions 1 and 2), I reran the ANOVA for Research Question 1 using the play-by-ear data and the ANOVA for Research Question 2 using the sight-reading data, each with the factors of group, time, and key. For both ANOVAs, the first step of the analysis was to consider any interaction effects of key. Where interactions were evident, post hoc comparisons considered the effects of each key separately. Where interactions of key were not evident, the analysis looked for any interaction or main effects of group or time.

The remaining question of the study was to examine the effects of instruction on student attitudes (Research Question 3). The most reliable and important questions of the SAI were Questions 25–31, and therefore the data of those questions were analyzed

through ANOVA tests with the factors of group and aptitude. No interaction effects were found. Therefore, all subsequent analysis of the SAI omitted the factor of aptitude.

Each set of three questions of the SAI Questions 1–24 was analyzed as a set, with the factors of group and key, to assess pre- and postinstruction attitudes. Next, gain scores (Questions 1–3 compared to 13–16, for example) were analyzed to determine whether students' attitudes changed as a result of instruction. Then, one-way ANOVAs were conducted for Questions 25–31. Lastly, I did a content analysis of the free-response Questions 32–36.

The a priori significance level of the study was established at  $\alpha = .05$ . The risk of incorrectly rejecting any single null hypothesis, or concluding a difference between groups where no difference truly existed, was 5%. The significance level for all post hoc analyses, planned or unplanned, was adjusted per Bonferonni procedures: With  $\alpha_{FW} = .05$ , the per comparison significance level was set at  $\alpha_{PC} = .05/n$ , where  $n$  is the number of pairwise comparisons.

For all ANOVA analyses, I calculated effect sizes and conducted post hoc power analyses. With effect size defined as the degree to which the phenomenon under observation is present, I used Cohen's (1988) definitions of small ( $d = .2$ ), medium ( $d = .5$ ) and large ( $d = .8$ ) effect sizes, where a medium effect is considered that which is "visible to the naked eye" (p. 26).

Given my a priori significance level and small sample sizes, I anticipated low statistical power. For this study, the probability of rejecting a false null hypothesis was low. Were differences between groups to exist, my chance of discovering these



differences was slight. From the calculated effect sizes for the performance tests, I estimated statistical power using Cohen's power table for a two-tailed comparison of two mean scores (Cohen, 1988, pp. 36–37). The results of the study should be interpreted in view of sample size, effect sizes, and statistical power.

### Summary

This study compared learning songs by ear to reading exercises in notation in the keys of Bb, Db, and G concert. Students were middle school brass and woodwind musicians in grades 7–8. Treatments comprised 12 lessons of 20 minutes in duration. Before and after instruction, students performed a familiar melody by ear (Research Question 1) and sight-read several short etudes (Research Question 2). Students also responded to an attitude survey designed to measure participants' perceptions of the effectiveness and appeal of instruction (Research Question 3). Because of the importance of examining instructional efficacy in consideration of the aptitudes and abilities of individual students (Cronbach & Snow, 1981), initial data analysis included the variable of music aptitude (Research Question 4). When no interactions were found, subsequent statistical tests dropped aptitude as a variable for consideration.

## CHAPTER IV

### RESULTS

This study compared two instructional approaches in instrumental music. Participants in the experimental group learned songs by ear while participants in the contact-control group performed technical exercises from notation. Using a stratified random sampling procedure, I assigned participants to groups based on music aptitude, instrument played, and music background. Chapter 4 begins with an overview of group demographics.

Performance tests measured pre- and postinstruction pitch accuracy in song-by-ear and sight-reading performances in the keys of Bb, Db, and G concert (Research Questions 1 and 2). The *Student Attitude Inventory* documented participants' attitudes toward instruction (Research Question 3). Analyses of the performance test scores and the attitude survey in consideration of student aptitude allowed for the examination of potential differential effects of instruction among participants of differing levels of music aptitude (Research Question 4).

In all analyses for the study, the a priori significance level was set at  $\alpha = .05$ . The significance level for all post hoc comparisons was adjusted per Bonferroni procedures, with each per comparison significance level as  $\alpha_{PC} = .05/n$ , where  $n$  is the number of

pairwise comparisons. All descriptive statistics were calculated using Microsoft Excel X. Other computations for the study were calculated using SAS® Version 9.1.3.

### Group Demographics and Music Aptitude

#### *Student Background Survey (SBS)*

The purposes of the SBS were to collect demographic information about participants both for general descriptive purposes and for group assignment. In assigning students to groups, foremost was the necessity of balancing the two groups in terms of music aptitude and instrumentation. Second, private lesson instruction and ensemble experiences beyond the school concert band, particularly jazz band, were considered.

Because this was the advanced band at this grades 7–8 middle school, there were fewer seventh graders ( $n = 7$ ) than eighth graders ( $n = 21$ ) in the class. Students in each grade were divided approximately equally between the two groups. On average, students had about three years, or 36 months, of performing experience on their band instruments: songs group,  $M = 35.08$ ,  $SD = 14.25$ ; exercises group,  $M = 35.20$ ,  $SD = 11.53$ .

Six students had taken private lessons on their band instrument, ranging from 1 month to 4 years. Eight students had studied piano: 3 for 2 years or less, and 5 for longer than 2 years. A number of students had been or were currently involved in other ensembles, such as jazz band ( $n = 10$ ), orchestra ( $n = 2$ ), and/or choir ( $n = 9$ ). A few students had attended a summer music camp ( $n = 5$ ). The two groups were matched in terms of number of students who had studied privately, length of private instruction, and involvement in other ensembles.

Statistical analyses confirmed that the groups were matched in terms of music background. Type of data (categorical) and small cell sizes (often  $n \leq 5$ ) suggested the Fisher exact test. There were no statistically significant differences between groups in terms of length of band study, private lessons, and ensemble experiences outside of the school concert band. Table 3 highlights the information collected through the SBS.

Table 3: *Music Background of Participants*

	Songs Group	Exercises Group
	$n = 13$	$n = 15$
Year in School		
Seventh Grade	2	5
Eighth Grade	11	10
Instrument Played		
Brass	5	7
Woodwind	8	8
Private Lessons		
Band Instrument	2	6
Piano	2	6
Other Ensembles		
Jazz Band	4	6
Orchestra	1	1
Choir	4	5
Music Camp	2	3

### *Music Aptitude*

The purpose of the music aptitude test (AMMA, Gordon, 1989) was to measure participants' capacities to achieve in music. This information assisted in the assignment of students to groups and in determining any interaction effects of type of treatment with

aptitude. For the study sample, scores were negatively skewed. The mode score was the 73<sup>rd</sup> percentile ( $n = 4$ ), the median score was the 69<sup>th</sup> percentile, and the mean score was well above the 50<sup>th</sup> percentile ( $M = 63.68, SD = 20.76$ ).

A Fisher exact test revealed no significant differences between treatment groups according to category of aptitude,  $p = 1.00$ . Table 4 show the number of participants in each aptitude category.

Table 4: *Frequency Distribution: Aptitude Categories by Group*

Aptitude Category	Songs Group	Exercises Group
Low ( $\leq 40\%$ )	2	3
Moderate (41–79%)	7	8
High ( $\geq 80\%$ )	4	4

A one-way ANOVA indicated no statistically significant difference in aptitude between the two treatment groups,  $F(1,26) = 1.05, p = .31$ . Table 5 reports descriptive statistics for the two groups.

Table 5: *Aptitude Percentile Scores by Group*

Songs Group			Exercises Group		
$n$	$M$	$SD$	$n$	$M$	$SD$
13	68.00	21.65	15	59.93	19.93

## Descriptive Data: Performance Tests

Two adjudicators scored all performance tests for the main study. The first step of the analysis was to calculate inter-rater reliability. With group as a fixed effect, intra-class correlation coefficients ranged from  $ICC = .94$  to  $ICC = .99$ , as shown in Table 6.

Table 6: *Inter-Rater Reliability*

	Song Tasks			Etude Tasks		
	Bb	Db	G	Bb	Db	G
Pretests	.97	.94	.96	.99	.96	.97
Posttests	.97	.95	.98	.96	.97	.97

*Note.* Values are intra-class correlation coefficients.

The next step was to calculate descriptive statistics and confidence intervals (Table 7) and gain scores (Table 8). In addition, the data were examined for any signs of abnormality or error. Only two cases of performance decline were noted, one severe and the other less so, but both involved students in the songs group on the Db etudes. Given the small sample and the potential for just one outlier to skew the results, I will discuss these data in Chapter 5.

Table 7: Performance Tests: Descriptive Data and Confidence Intervals

	Songs Group				Exercises Group			
	<i>M</i>	<i>SD</i>	Lower Limit	Upper Limit	<i>M</i>	<i>SD</i>	Lower Limit	Upper Limit
Pretest Songs								
Bb Concert	68.36	24.68	54.48	82.31	66.67	24.19	53.71	79.62
Db Concert	41.47	27.90	25.27	50.98	35.80	15.30	23.83	47.76
G Concert	36.05	21.27	20.22	51.89	44.49	30.19	30.33	58.66
Pretest Etudes								
Bb Concert	91.61	9.93	83.78	99.45	91.54	11.10	81.22	95.81
Db Concert	62.51	24.75	44.99	74.41	60.68	27.15	44.30	71.69
G Concert	66.51	22.70	52.67	80.35	69.20	25.96	53.17	78.94
Posttest Songs								
Bb Concert	79.60	22.55	65.87	93.33	73.77	25.33	60.98	86.55
Db Concert	66.67	27.32	55.48	81.48	41.01	21.39	31.12	54.38
G Concert	61.20	28.43	48.62	79.47	51.59	26.55	3.72	65.96
Posttest Etudes								
Bb Concert	96.20	6.32	91.32	100.00	95.91	8.85	90.02	99.29
Db Concert	72.33	26.87	60.12	86.01	77.43	17.05	65.38	89.48
G Concert	77.36	13.56	67.15	87.57	82.25	17.65	68.54	87.55

*Note.* Limits represent 95% confidence intervals.

Table 8: *Performance Tests: Gain Scores*

	Songs Group			Exercises Group		
	Pretest	Posttest	Gain	Pretest	Posttest	Gain
Song Tasks						
Bb concert	68.36	79.60	+11.24	66.67	73.77	+7.10
Db concert	41.47	66.67	+25.20	35.80	41.01	+5.21
G concert	36.05	61.20	+25.15	44.49	51.59	+7.10
Etude Tasks						
Bb concert	91.61	96.20	+4.59	91.54	95.91	+4.37
Db concert	62.51	72.33	+9.82	60.68	77.43	+16.75
G concert	66.51	77.36	+10.85	69.20	82.25	+13.05

The analysis continued with two repeated-measures ANOVAs. The within-subjects variables were time (pretest and posttest) and key (Bb, Db, and G). The between-subjects variable was instructional group (songs or exercises). The results of the songs ANOVA and etudes ANOVA are presented in the next sections of this chapter.

#### Research Question 1: Effects on Song-by-Ear Achievement

In the analysis of song-by-ear achievement, there was a statistically significant interaction of group with time,  $F(1, 26) = 5.84, p = .02$ , meaning that the effect of treatment was not the same for both groups. Consequently, the analysis compared pre-



and posttest scores for each group in each key, resulting in six post hoc comparisons. The significance level was adjusted,  $\alpha_{PW} = .008$ . For the songs group, there was statistically significant improvement in the keys of Db and G, but not in Bb. For the exercises group, no statistically significant improvement was noted. Table 9 presents the results of the ANOVA, while Table 10 summarizes the song data and the results of the follow-up pairwise comparisons.

Table 9: *ANOVA Results: Song-by-Ear Achievement*

Source	<i>df</i>	<i>F</i>	<i>p</i>
Group (G)	(1, 26)	3.05	.09
Time (T)	(1, 26)	25.07**	< .01
G x T	(1, 26)	5.84*	.02
Key (K)	(2, 52)	19.75**	< .01
G x K	(2, 52)	0.58	.56
T x K	(2, 50)	1.04	.36
G x T x K	(2, 50)	2.68	.08

*Note.* Two observations missing: one pretest song and one posttest song.

\* $p < .05$ . \*\* $p < .01$ .

Table 10: *Summary: Song-by-Ear Achievement*

	Pretest	Posttest	$t(1,26)$	$p$	$d$
Songs Group					
Bb Concert	68.36	79.60	2.18	.034	.48
Db Concert	41.47	66.67	5.16*	< .001	.91
G Concert	36.05	61.20	4.38*	< .001	1.01
Exercises Group					
Bb Concert	66.67	73.77	1.72	.091	.29
Db Concert	35.80	41.01	1.14	.260	.28
G Concert	44.49	51.59	1.53	.132	.25

*Note.* There was an interaction effect of group with time,  $p < .05$ .

\* $p < .008$ , post hoc comparisons.

The magnitude of treatment effect in the newly learned keys of Db and G concert was large, .91 and 1.01, respectively. These effect sizes yielded moderate statistical power: approximately .60 and .69, respectively, meaning that the analysis had a 60% or greater chance of detecting significant improvements in Db and G if, indeed, improvement occurred. In contrast, effect sizes for the exercises group were moderately small, with correspondingly low statistical power.

### Research Question 2: Effects on Sight-Reading Achievement

In the analysis of sight-reading achievement, there were no main or interaction effects of group. There was, however, a statistically significant interaction of time with key,  $F(2, 52) = 4.15, p = .02$ , meaning that improvement due to treatment was not the same for all three keys. Consequently, the analysis considered both groups together and compared pre- and posttest scores in each key, resulting in three post hoc comparisons. The significance level was adjusted,  $\alpha_{PW} = .017$ . Regardless of instructional treatment, there was statistically significant improvement in all three keys. Table 11 presents the results of the ANOVA, while Table 12 summarizes the etude data and the results of the follow-up pairwise comparisons.

Table 11: *ANOVA Results: Sight-Reading Achievement*

Source	<i>df</i>	<i>F</i>	<i>p</i>
Group (G)	(1, 26)	0.00	.96
Time (T)	(1, 26)	30.23**	< .01
G x T	(1, 26)	0.76	.39
Key (K)	(2, 52)	53.93**	< .01
G x K	(2, 52)	0.05	.95
T x K	(2, 52)	4.15*	.02
G x T x K	(2, 52)	0.24	.79

*Note.* \* $p < .05$ . \*\* $p < .01$ .

Table 12: *Summary: Sight-Reading Achievement*

	Pretest	Posttest	$t(1, 52)$	$p$	$d$
Both Groups Together					
Bb Concert	91.57	96.05	3.75*	< .001	.50
Db Concert	61.53	75.06	4.55*	< .001	.57
G Concert	67.95	79.98	3.53*	< .001	.60

*Note.* There was no main effect of group, or interaction of group,  $p > .05$ .

\* $p < .017$ , post hoc comparisons.

In all keys, the magnitude of treatment effect was a medium size, yielding moderate statistical power: .45 in Bb, .56 in Db, and .59 in G. The analysis had about a 50% chance of detecting improvement if, indeed, improvement occurred.

### Research Question 3: Effects on Student Attitudes

The main purpose of the SAI was to collect data on the attitudes of participants toward the performance tests and instructional activities. These data were used to answer two questions of primary interest: Did students feel the instruction was effective? Did students feel the instruction was enjoyable?

#### *SAI Part A: Task Perception and Performance Self-Assessment*

The first 24 questions of the SAI asked participants to rate the difficulty of the performance tasks and their success on each task before and after instruction. (See Appendix G.) Each set of three questions related to a specific time (pre- or posttest), task (songs or etudes), and attitude (difficulty of task or excellence of performance). For

analysis, responses to similar SAI Questions 1–24 were combined across the three keys of this study (e.g., Questions 1–3, 4–6, etc.).

The research question of interest was to compare the reference key of Bb with the newly learned keys of Db and G. First, however, it was necessary to confirm that the perceived performance challenges of the new keys were similar. For each mixed-effects ANOVA, the dependent variable was either difficulty of task or perceived performance success. Group (songs or exercises) was the 2-level between-subjects variable and key (Bb, G, or Db) was the 3-level within-subjects variable.

The initial step of each ANOVA was to check for interaction effects of group with key. In two cases, an interaction of group with key was evident. Subsequent examination of the data showed that participants perceived the performances challenges of Db and G to be approximately the same.

Where an interaction not was evident, post hoc analyses compared the reference key Bb with the newly learned keys,  $\alpha_{PC} = .025$ . All pairwise comparisons showed no statistically significant differences between the newly learned keys (Db and G) considered together in contrast with the reference key of Bb, and there were no main effects due to instruction.

*Perceived task difficulty.* Table 13 highlights the results of the analysis of perceived task difficulty. There were no main effects of group, only interaction effects of group with key.

Table 13: *Perceived Task Difficulty*

	Bb Concert		Db Concert		G Concert	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Pretest Song Difficulty						
Songs Group	2.69	0.95	3.69	1.38	3.23	0.93
Exercises Group	3.29	1.25	3.87	0.99	3.53	0.83
Both Groups Together	2.96 <sub>a</sub>	1.14	3.79 <sub>a</sub>	1.17	3.39	0.88
Posttest Song Difficulty						
Songs Group	2.08	0.95	2.62	0.96	2.46	0.97
Exercises Group	2.20	1.15	3.47	1.30	3.13	0.92
Both Groups Together	2.14 <sub>a,b</sub>	1.04	3.07 <sub>a</sub>	1.21	2.82 <sub>b</sub>	0.98
Pretest Etude Difficulty*						
Songs Group	1.77 <sub>a,b</sub>	0.83	3.00 <sub>a,c</sub>	1.00	2.69 <sub>b,c</sub>	0.95
Exercises Group	2.53	0.83	2.93	1.28	2.67	0.98
Both Groups Together	2.18	0.91	2.96	1.14	2.68	0.94
Posttest Etude Difficulty*						
Songs Group	1.92	0.95	2.23	0.93	2.15	0.95
Exercises Group	1.73 <sub>a,b</sub>	0.88	2.53 <sub>a</sub>	1.06	2.67 <sub>b</sub>	0.88
Both Groups Together	1.82	0.90	2.39	0.99	2.43	0.92

*Note.* Ratings are 1 (easy) to 5 (difficult). Asterisks indicate group with key interactions. There were no significant main differences between groups. Row subscripts reveal effects of key,  $p < .025$ .

Questions 1, 2, and 3 asked students to rate the difficulty of performing the songs before instruction. The ANOVA revealed a statistically significant effect of key,  $F(2, 54) = 6.86, p < .01$ , with a post hoc analysis indicating that students perceived the pretest songs in Db and G as significantly more difficult than the pretest song in Bb,  $t(54) = 3.25, p < .01$ . Questions 13, 14, and 15 asked students to rate the difficulty of performing the songs after instruction. The ANOVA revealed a statistically significant effect of key,  $F(2, 54) = 9.25, p < .01$ , with a post hoc analysis indicating that students perceived the posttest songs in Db and G as significantly more difficult than the posttest song in Bb,  $t(54) = 4.15, p < .001$ .

Questions 7, 8, and 9 asked students to rate the difficulty of performing the etudes before instruction. The ANOVA revealed a statistically significant interaction effect of group with key,  $F(2, 52) = 4.56, p = .02$ . Post hoc analyses indicated that students in the songs group perceived the pretest etudes in Db and G as significantly more difficult than the pretest etude in Bb,  $t(52) = 5.48, p < .001$ , while participants in the exercises group perceived all pretest etudes as equally difficult,  $t(52) = 1.46, p = .15$ . Questions 19, 20, and 21 asked students to rate the difficulty of performing the etudes after instruction. The ANOVA revealed a statistically significant interaction effect of group with key,  $F(2, 52) = 3.44, p = .04$ . Post hoc analyses indicated that students in the songs group perceived all posttest etudes as equally difficult,  $t(52) = 1.54, p = .13$ , while participants in the exercises group perceived the posttest etudes in Db and G as significantly more difficult than the posttest etude in Bb,  $t(52) = 5.34, p < .01$ .

*Perceived performance excellence.* Table 14 highlights the results of the analysis of perceived performance excellence. There were no main or interaction effects of group, only effects of key.

Table 14: *Perceived Performance Excellence*

	Bb Concert		Db Concert		G Concert	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Pretest Song Excellence						
Songs Group	3.08	0.95	2.15	1.07	2.77	1.01
Exercises Group	3.27	0.80	2.20	1.01	2.73	0.96
Both Groups Together	3.18 <sub>a,b</sub>	0.86	2.18 <sub>a,c</sub>	1.02	2.75 <sub>b,c</sub>	0.97
Posttest Song Excellence						
Songs Group	3.62	1.04	2.92	1.19	3.31	0.95
Exercises Group	3.47	1.06	2.53	1.13	2.73	0.80
Both Groups Together	3.54 <sub>a,b</sub>	1.04	2.71 <sub>a</sub>	1.15	3.01 <sub>b</sub>	0.90
Pretest Etude Excellence						
Songs Group	3.38	1.04	2.62	1.33	2.69	1.32
Exercises Group	3.13	0.92	2.60	1.30	2.73	0.96
Both Groups Together	3.25 <sub>a,b</sub>	0.97	2.61 <sub>a</sub>	1.29	2.71 <sub>b</sub>	1.12
Posttest Etude Excellence						
Songs Group	3.77	1.09	3.31	1.18	3.46	0.78
Exercises Group	4.13	0.83	3.20	1.08	3.13	1.19
Both Groups Together	3.96 <sub>a,b</sub>	0.96	3.25 <sub>a</sub>	1.11	3.29 <sub>b</sub>	1.01

*Note.* Ratings are 1 (poor) to 5 (excellent). There were no significant main differences between groups. Row subscripts reveal effects of key,  $p < .025$ .



Questions 4, 5, and 6 asked students to rate how well they thought they performed the songs before instruction. The ANOVA revealed a statistically significant effect of key,  $F(2, 54) = 22.97, p < .001$ , with a post hoc analysis indicating that students believed they performed their pretest song in Bb significantly better than their pretest songs in Db and G,  $t(54) = 5.57, p < .001$ . Questions 16, 17, and 18 asked students to rate how well they thought they performed the songs after instruction. The ANOVA revealed a statistically significant effect of key,  $F(2, 54) = 7.76, p = .001$ , with a post hoc analysis indicating that students believed they performed their posttest songs in Bb significantly better than their posttest songs in Db and G,  $t(54) = 3.79, p < .001$ .

Questions 10, 11, and 12 asked students to rate how well they thought they performed the etudes before instruction. The ANOVA revealed a statistically significant effect of key,  $F(2, 54) = 6.25, p < .01$ , with a post hoc analysis indicating that students believed they performed their pretest etude in Bb significantly better than their pretest etudes in Db and G,  $t(54) = 3.49, p < .01$ . Questions 22, 23, and 24 asked students to rate how well they thought they performed the etudes after instruction. The ANOVA revealed a statistically significant effect of key,  $F(2, 54) = 9.33, p < .01$ , with a post hoc analysis indicating that students believed they performed their posttest etude in Bb significantly better than their posttest etudes in Db and G,  $t(54) = 4.31, p < .01$ .

#### *SAI Part B: Analysis of Gain Scores*

*Perceived changes in task difficulty.* On the SAI, students were asked to evaluate the difficulty of the performance tasks before and after instruction. Taking those gain

scores, the analysis was able to establish whether students felt that the posttests were easier than, the same as, or more difficult than the pretests. Student ratings were from 1 (easy) to 5 (difficult). Gain scores ranged from -3 to +4 for song performances and -2 to +4 for etude performances. Table 15 presents mean scores for perceived task difficulty, contrasting pre- and posttest ratings.

Table 15: *Gain Scores: Perceived Task Difficulty*

	Pretest		Posttest		Gain
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Songs Group					
Bb Song	2.69	0.95	2.08	0.95	0.61
Db Song	3.69	1.38	2.62	0.96	1.07
G Song	3.23	0.93	2.46	0.97	0.77
Exercises Group					
Bb Song	3.20	1.26	2.20	1.15	1.00
Db Song	3.87	0.99	3.47	1.30	0.40
G Song	3.53	0.83	3.13	0.92	0.40
Songs Group					
Bb Etude	1.77	0.83	1.92	0.95	-0.15
Db Etude	3.00	1.00	2.23	0.93	0.77
G Etude	2.69	0.95	2.15	0.80	0.54
Exercises Group					
Bb Etude	2.53	0.83	1.73	0.88	0.80
Db Etude	2.93	1.28	2.53	1.06	0.40
G Etude	2.67	0.98	2.67	0.98	0.00

*Note.* Perceived difficulty ratings are 1 (easy) to 5 (difficult). Gains are pretest ratings minus posttest ratings.

Regardless of instruction, nearly 60% of students in both groups perceived the song posttests as easier than the pretests. Approximately one quarter of students in the songs group perceived no change in song difficulty due to instruction. Responses regarding ease of etudes were slightly unpredictable. More students in the exercises group than the songs group perceived an easing of etude difficulty from pre- to posttest (40% compared to 26%). However, for the new keys only, where pretest scores revealed the most room for improvement, the results were reversed. A slightly higher percentage of students in the songs group (35%) than the exercises group (30%) perceived an easing of etude difficulty. (See Table 16.)

Table 16: *Frequency Distribution: Perceived Changes in Task Difficulty*

	Ease of Songs		Ease of Etudes	
	All Keys Together	New Keys Only	All Keys Together	New Keys Only
<b>Songs Group</b>				
Neutral Scores	10	7	22	14
Negative Scores	6	3	7	3
Positive Scores	23	16	10	9
N of Responses	39	26	39	26
Positive Responses	59%	62%	26%	35%
<b>Exercises Group</b>				
Neutral Scores	15	9	23	17
Negative Scores	4	4	4	4
Positive Scores	26	17	18	9
N of Responses	45	30	45	30
Positive Responses	58%	57%	40%	30%

A 2 x 3 repeated-measures ANOVA, with type of instruction (group) as the between-subjects factor and key as the within-subjects factor, determined whether gain scores were statistically significant. There were no main or interaction effects of group. (See Table 17.)

Table 17: ANOVA Results: Perceived Changes in Song Difficulty

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
Between subjects				
Group	1	0.46	< .01	.50
Group within-group error	26	(2.20)		
Within subjects				
Key	2	0.38	< .01	.69
Group x Key	2	2.15	.02	.13
Group x Key within-group error	52	(0.97)		

*Note.* Group refers to instructional group (i.e., type of treatment). Values enclosed in parentheses represent mean square errors.

A similar 2 x 3 ANOVA determined whether students perceived the posttest etudes to be significantly easier than the pretest etudes. (See Table 18.)

Table 18: ANOVA Results: Perceived Changes in Etude Difficulty

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
Between subjects				
Group	1	0.00	< .01	.97
Group within-group error	26	(2.54)		
Within subjects				
Key	2	1.93	< .01	.15
Group x Key	2	11.41*	.05	< .01
Group x Key within-group error	52	(0.41)		

*Note.* Group refers to instructional group (i.e., type of treatment). Values enclosed in parentheses represent mean square errors.

\* $p < .05$ .

Here there was a statistically significant interaction of group with key,  $F(2, 52) = 11.41, p < .01$ . Post hoc analyses revealed that students in the exercises group perceived the posttest etude in Bb to be significantly easier than the pretest etude in Bb,  $t(52) = 2.93, p = .005$ . No other differences were noted.

*Perceived improvement in performance.* On the SAI, students were asked to evaluate the excellence of their performances before and after instruction. Taking those gain scores, the analysis was able to establish whether participants felt that their posttest performances were better than, the same as, or worse than their pretest performances. Student ratings were from 1 (poor) to 5 (excellent). Gain scores ranged from  $-3$  to  $+3$  for

song performances and -2 to +4 for etude performances. Table 19 presents means scores for perceived performance excellence, contrasting pre- and posttest ratings.

Table 19: *Gain Scores: Perceived Performance Excellence*

	Pretest		Posttest		Gain
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Songs Group					
Bb Song	3.08	0.95	3.62	1.04	0.54
Db Song	2.15	1.07	2.92	1.19	0.77
G Song	2.77	1.01	3.31	0.95	0.54
Exercises Group					
Bb Song	3.27	0.80	3.47	1.06	0.20
Db Song	2.20	1.00	2.53	1.13	0.33
G Song	2.73	0.96	2.73	0.80	0.00
Songs Group					
Bb Etude	3.38	1.04	3.77	1.09	0.39
Db Etude	2.62	1.33	3.31	1.18	0.69
G Etude	2.69	1.32	3.46	0.78	0.77
Exercises Group					
Bb Etude	3.13	0.92	4.13	0.83	1.00
Db Etude	2.60	1.30	3.20	1.08	0.60
G Etude	2.73	0.96	3.13	1.19	0.60

*Note.* Perceived performance ratings are 1 (poor) to 5 (excellent). Gains are posttest ratings minus pretest ratings.

More students in the songs group (44%) than in the exercises group (33%) perceived their song performances as having improved from pre- to posttest. However, almost half of the students in both groups perceived no change in song performance.

Regardless of instruction, approximately 45% of students perceived improved performances on the etude posttests, although a similar proportion of students perceived no change. (See Table 20.) By coincidence, some frequency counts in Table 20 are identical; these are not typographical errors.

Table 20: *Frequency Distribution: Perceived Changes in Performance Excellence*

	Excellence of Songs		Excellence of Etudes	
	All Keys Together	New Keys Only	All Keys Together	New Keys Only
<b>Songs Group</b>				
Neutral Scores	18	11	18	11
Negative Scores	4	3	4	3
Positive Scores	17	12	17	12
N of Responses	39	26	39	26
Positive Responses	44%	46%	44%	46%
<b>Exercises Group</b>				
Neutral Scores	21	15	19	13
Negative Scores	9	6	5	4
Positive Scores	15	9	21	13
N of Responses	45	30	45	30
Positive Responses	33%	30%	47%	43%

A 2 x 3 repeated-measures ANOVA, with type of instruction (group) as the between-subjects factor and key as the within-subjects factor, determined whether gain scores were statistically significant. There were no main or interaction effects of group. (See Table 21.)

Table 21: *ANOVA Results: Perceived Changes in Song Performance*

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
Between subjects				
Group	1	1.48	.04	.24
Group within-group error	26	(2.71)		
Within subjects				
Key	2	0.87	.01	.42
Group x Key	2	0.11	< .01	.90
Group x Key within-group error	52	(0.65)		

*Note.* Group refers to instructional group (i.e., type of treatment). Values enclosed in parentheses represent mean square errors.

A similar 2 x 3 ANOVA determined whether students perceived their performances of the posttest etudes as significantly better than their performances of the pretest etudes. There were no main or interaction effects of group. (See Table 22.)



Table 22: ANOVA Results: Perceived Changes in Etude Performance

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
Between subjects				
Group	1	0.01	< .01	.91
Group within-group error	26	(4.00)		
Within subjects				
Key	2	0.12	< .01	.88
Group x Key	2	2.63	.03	.08
Group x Key within-group error	52	(0.68)		

*Note.* Group refers to instructional group (i.e., type of treatment). Values enclosed in parentheses represent mean square errors.

### *SAI Part C: Attitudes Toward Class Instruction*

Questions 25, 26, and 27 asked students to evaluate whether the instructional activities helped them to improve their playing skills, while Question 28 focused on improvement in listening skills. Question 29 asked students to evaluate whether the instructional activities were enjoyable. Questions 30 and 31 asked students to offer their attitudes about continued instruction, with student answers most likely taking into account both instructional efficacy and appeal.

Investigating potential differences between groups due to type of instruction, one-way ANOVAs were conducted for these survey questions. Noting the compound risk for error with multiple ANOVAs, the analysis looked first for any pairs of questions where

student responses might be highly correlated in order that data from two or more questions might be combined and thereby facilitate a reduction in the total number of ANOVAs conducted. The Kendall's tau correlation for student responses on Question 25 with 26 was  $t = .62, p < .001$ ; and for Question 30 with 31,  $t = .66, p < .001$ .

Combining Question 25 with 26 and Question 30 with 31, there were five ANOVAs in all. (See Table 23.) The only significant difference between groups was found in the first ANOVA, which asked students if they felt their playing in the new keys had improved due to instruction. Students in the songs group ( $M = 4.00, SD = 0.86$ ) perceived more improvement in their playing than did students in the exercises group ( $M = 3.30, SD = 0.99$ ),  $F(1, 26) = 4.82, p = .04$ . Table 23 highlights mean scores and ANOVA results for Questions 25–31 of the SAI.

Table 23: *Descriptive Statistics and ANOVA Results: Attitudes Toward Instruction*

	Songs Group		Exercises Group		ANOVA	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i> (1, 26)	<i>p</i>
“Helped my playing”	3.46	0.97	3.40	1.12	0.02	.88
“I’ve improved in Db and G”	4.00	0.89	3.30	0.92	4.82*	.04
“Helped my ears”	3.08	1.04	3.00	0.65	0.06	.81
“Instruction was enjoyable”	2.85	0.80	2.80	1.21	0.01	.91
“I’d recommend this to a friend and in other keys”	2.27	1.12	2.43	1.50	0.12	.73

*Note.* Ratings are 1 (negative) to 5 (positive).

\* $p < .05$ .

#### *SAI Part D: Free Response Questions*

The free response questions of the SAI offered an opportunity for students to explain their attitudes toward instruction and elucidate their individual approach to music reading. As might be expected, the answers reflected a wide range of opinions and maturity levels. Most of the questions asked for a positive or negative response followed by comments. Where I have presented frequency counts, the tallies may not total to  $N = 28$  because some students provided explanations but not a “yes” or “no” response. Since there were few significant differences between groups in earlier questions, I will quantify all responses in terms of the sample as a whole rather than each group separately.

Although percussion data were not included in the tallies, some of the most interesting responses were from those students and a few of the free response comments will be quotations from the percussion surveys. All quotations are typed exactly as written by the students, including spelling.

*Question 32: Key signatures.* A majority of students believed that it was important to understand key signatures ( $n = 24$ ) and most wrote that they “understood” key signatures. Among students who indicated that they comprehended key signatures, a few answers nevertheless revealed confusion (e.g., “because you know how fast or slow to play the song”). A few answers advised that knowledge of key signatures was important not because it helps one to perform better or understand music, but because it “shows how smart you are” or helps you to avoiding looking “stupid.” Many of the positive responses were a variation of, “So you know what notes to play and don’t play wrong notes,” although only one student specifically mentioned that key signatures designate “which sharps or flats to play.” A few students indicated that knowledge of key signatures helps in developing “an ear for the music,” “finding the notes easier,” or in playing scales and then knowing how scales relate to pieces played in band. Among the negative responses ( $n = 3$ ), one student wrote, “Not important because it sounds the same” and another wrote, “No, they are all just notes.” One student stated, “I do percussion so I don’t use keys.”

*Question 33: Inner hearing.* When students were asked if they tried to internalize the music before playing (“Do you try to hear the piece inside your head?”) and whether

that skill was important, the responses were more divided. Approximately two thirds of students said they attempted to hear music internally ( $n = 16$ ) compared to one third who did not ( $n = 7$ ); a couple of students responded that the skill was “kinda” important ( $n = 2$ ). Slightly under half of the students believed this skill to be important ( $n = 12$ ) while others believed it to be unimportant ( $n = 9$ ); a few students thought it might be important ( $n = 3$ ).

Among the affirmative responses: “Yes, because you know what it sounds like” or “what it mite sound like then.” Similar responses included, “because it helps you realize your mistakes,” or simply, “because it is.” Whether or not a student attempted internalization was not always reflective of his or her thoughts concerning the value of the skill. A few students said they thought the skill was important but that they were not good at it. Other students chose internalization but did not feel it necessary “if you already know the notes” or “because I find it useless” or “because it’s kinda stupid.” One student thought it “not too important but helpful.”

*Question 34: Helpfulness of instruction.* Of all student participants, most students ( $n = 15$ ) found the instruction helpful. Some ( $n = 5$ ) found instruction somewhat helpful, and some ( $n = 6$ ) did not find instruction helpful. Among the positive responses, assistance or understanding of the new keys was of most benefit: “The practice activities were helpful to me. They helped me understand my keys better, especially Db and G. I had no clue how to play those keys well until I played this.” Two students in the songs group believed that instruction had helped them to “hear the notes better” and

consequently to improve their playing; one student in the scales group said he “heard the scales better, therefore I could play better.” Among students who did not find the activities helpful: “I hate practicing,” “I like to practice on my own in a quiet room without distractions,” “I can’t use my ability to hear very well,” and “I never try to play music by ear, and will never use those skills again.” One student commented that the activities were “kind of” helpful but that there was not a lot of time for instruction.

*Question 35: Enjoyment of instruction.* Considering all student participants, approximately half of the students found the instruction enjoyable ( $n = 10$ ) and half found it unenjoyable ( $n = 10$ ), with no evident trend between groups. Six students found instruction somewhat enjoyable. The most common reasons cited as to why instruction was not enjoyable, or only somewhat enjoyable, was that the instruction was difficult, confusing, or boring ( $n = 10$ ). However, some of these same students offered that they “hate practicing” in general, that they did not like being unable to sit with their friends, or that they were expected to listen during instruction and while others were playing.

Among students in the songs group, one reported that he was “horrible” at playing music by ear while another suggested that instruction was “okay, but easier if I saw the notes.” One student wrote that instruction was enjoyable because it was a smaller group and everyone got more attention, and another that “It was kinda hard and that took a lot of the fun out of it, but it’s learning, it’s not supposed to be fun.” A trombone student not yet fully grown enjoyed instruction except for having to reach seventh position in G major. An especially mature and conscientious student in the scales group admitted that the

instruction was not enjoyable to her: “Not really enjoyable, because in music unless I enjoy the music it’s self it’s kind of boring to me.”

*SAI: Summary of Results*

Analyses of participants’ responses to Questions 1–24 of the SAI revealed few statistically significant differences between groups. Before and after instruction, both groups rated the difficulty of the pre- and posttest songs similarly. The pretest songs in Db and G were perceived as significantly more difficult than the pretest song in Bb, and the posttest songs in Db and G were perceived as significantly more difficult than the posttest song in Bb. Rating the etude tasks, the only significant effect was a simple effect of Bb, with students in the songs group perceiving the posttest etude in Bb to be significantly easier than the pretest etude in Bb. Both groups rated their performance excellence similarly. Before and after instruction, students perceived their song and etude performances in Bb as significantly better than those in Db and G. Pre- and postinstruction ratings on the SAI were then used to calculate gain scores. Excepting a simple effect of key for increased ease of the Bb etude task for the exercises group, there were no other statistically significant differences between groups.

The remaining questions of the SAI asked students whether the instruction was helpful overall and whether it was enjoyable. When asked if instruction helped their playing specifically in the new keys, the songs group responded positively whereas the exercises group did not. When students were asked if instruction helped their playing overall or helped their ears, there were no significant differences between groups. When

students were asked if instruction was enjoyable, and if they would like to continue this type of instruction and whether they might recommend this instruction to a friend, again there were no differences between groups.

In general, student responses suggested that the instruction was perhaps more helpful than enjoyable. Mean scores related to enjoyment of instruction indicated that students were neutral or even slightly negative toward the instructional activities. A content analysis of the free response questions illuminated possible reasons why students did not particularly enjoy instruction: Some thought the instruction too difficult or boring, while others did not see the value in learning key signatures or playing by ear.

#### Research Question 4: Differential Effects of Aptitude

To learn whether aptitude might be a factor in student reactions to the instructional treatments, aptitude was included as a variable in the song and etude ANOVAs as well as the ANOVAs for Questions 25–31 of the SAI.

The performance ANOVAs included the between-subjects factors of instructional group (songs or exercises) and aptitude level (low, moderate, or high) and the within-subjects factors of time (pretest and posttest) and key (Bb, Db, and G). Although there was a statistically significant interaction of time with aptitude, there were no simple effects of aptitude. For song-by-ear achievement,  $F(2, 24) = 0.88, p = .43$ ; the instructional treatment did not differentially affect the performance achievement of students of low, moderate, and high aptitude. For sight-reading achievement,  $F(2, 24) = 0.87, p = .43$ ; the instructional treatment did not differentially affect the performance



achievement of students of low, moderate, and high aptitude. Since aptitude did not appear to be related to performance achievement, I analyzed the song and etude data without including aptitude as a variable, and all calculations previously reported in this chapter reflected this decision.

Student attitudes toward instruction as measured on the SAI did not vary among students with differing aptitude levels. (See Table 24.) Since aptitude did not appear to be related to attitude, I analyzed all SAI questions without including aptitude as a variable, and all calculations previously reported in this chapter reflected this decision.

Table 24: ANOVA Results: Effects of Aptitude on Attitude: SAI Questions 25–31

Source	<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
Question 25–26				
Group	1	3.90	.12	.06
Aptitude	2	0.35	.02	.71
Group x Aptitude	2	0.04	< .01	.97
Question 27				
Group	1	0.01	< .01	.91
Aptitude	2	0.11	< .01	.90
Group x Aptitude	2	0.50	.04	.61
Question 28				
Group	1	0.31	.01	.58
Aptitude	2	0.39	.03	.68
Group x Aptitude	2	2.35	.17	.12
Question 29				
Group	1	< 0.00	< .01	.96
Aptitude	2	0.03	< .01	.97
Group x Aptitude	2	0.34	.03	.71
Question 30–31				
Group	1	< 0.00	< .01	.95
Aptitude	2	0.07	< .01	.94
Group x Aptitude	2	0.20	.01	.82

*Note.* Due to moderately high correlations, student responses for Questions 25 and 26 were averaged together, as were responses for Questions 30 and 31.

## Summary

Analyses of the performance test data began with an investigation of inter-rater reliability, which was found to be high. The next step was to check for any interaction effects of treatment with aptitude. No effects of aptitude were noted. Subsequently, the analyses considered any effects of type of instruction or key. The results of the analysis of the song-by-ear data indicated that students in the songs group improved significantly in the new keys of Db and G, approximately 25 percentage points, while students in the exercises group did not improve in playing by ear in any of the three keys. The results of the analysis of the sight-reading data indicated that students in both groups improved significantly in all three keys: approximately 4.5 percentage points in Bb and an average of 12.5 percentage points in each of the new keys.

The analysis also examined the effects of type of instruction on student attitudes. No interaction effects of aptitude were found. The only statistically significant difference between groups was perceived improvement in the new keys: Students in the songs group perceived instruction as beneficial for learning to play in the keys of Db and G, while students in the exercises group did not perceive the instruction as beneficial in learning the new keys.

## CHAPTER V

### DISCUSSION

#### Description of the Study

The main purpose of this study was to examine the effects of learning songs by ear in multiple keys on the play-by-ear and sight-reading skills of middle school band students. Secondary purposes of the study were to investigate the effects of learning songs by ear on student attitudes and to explore the possibility of differential effects due to music aptitude.

Participants were brass and woodwind musicians in grades 7–8 who had been studying an average of three years. Students were placed in one of two groups according to aptitude, as measured by the *Advanced Measures of Music Audiation* (AMMA) (Gordon, 1989), and instrument. Consideration was given to balancing the groups in terms of private lesson study and outside musical experiences as reported on a *Student Background Survey* (SBS). After I considered the groups matched, I randomly assigned one group to be the experimental group. Statistical analysis confirmed that the groups were well matched on the selection criteria.

The researcher and the cooperating band director served as instructors for the study, alternately teaching the two groups. Students in the experimental group learned songs by ear in the keys of Bb, Db, and G concert. Students in the contact-control group

learned technical exercises in those same keys. The exercises were gathered from two books in the school music library. The period of instruction was three 20-minute lessons per week for four weeks.

To assess skills in playing by ear, each student performed *Row, Row, Row Your Boat* in the keys of Bb, Db, and G both before and after instruction. To assess sight-reading, I composed six etudes, 8 measures in length and using simple rhythms. Three etudes served as the pretest and three the posttest, one each in the keys of Bb, Db, and G. Two adjudicators independently evaluated pitch accuracy of recorded performances. Qualitative and quantitative data from a researcher-authored *Student Attitude Inventory* (SAI) were analyzed in an effort to determine students' attitudes regarding the effectiveness and appeal of the instructional treatments.

### Summary of Results

#### *Research Question 1: Playing by Ear*

Were there any effects on song-by-ear achievement due to type of instruction? A repeated-measures ANOVA with the variables of group, time, and key was used to evaluate the effects of instruction. Due to an interaction of group with time, I conducted follow-up pairwise comparisons ( $\alpha_{PW} = .008$ ). The songs group improved significantly in playing by ear in the keys of Db and G,  $p < .001$ , but not in Bb. The exercises group did not improve in any of the keys.

*Research Question 2: Sight-Reading*

Were there any effects on sight-reading achievement due to type of instruction? A repeated-measures ANOVA with the variables of group, time, and key was used to evaluate the effects of instruction. There was no effect of group. Due to an interaction of key with time, I conducted follow-up pairwise comparisons ( $\alpha_{PW} = .017$ ). Both groups improved significantly in sight-reading in all three keys,  $p < .001$ .

*Research Question 3: Student Attitudes*

Were there any effects on student attitudes due to type of instruction? In the analysis of gain scores for ease of song task, there were no interaction or main effects of group. In the analysis of gain scores for excellence of song performance, there were no interaction or main effects of group. In the analysis of gain scores for ease of etude task, there was an interaction of group with key, with students in the exercises group perceiving the posttest etude in Bb as significantly easier than the pretest etude in Bb. This finding may be related to preinstruction ratings, where the songs group considered the pretest etude in Bb relatively easy ( $M = 1.77$ ) compared to the exercises group ( $M = 2.53$ ), although that difference was not statistically significant. In the analysis of gain scores for excellence of etude performance, there were no interaction or main effects of group.

Questions 25–31 were postinstruction survey questions. When students were asked if the instruction helped them improve in the keys of Db and G, students in the songs group perceived significantly more improvement than did students in the exercises

group. However, no statistically significant differences between groups were noted for the other statements: (a) “Helped my playing,” (b) “Helped my ears,” (c) “Instruction was enjoyable,” and (d) “I would recommend this to a friend and in other keys.”

The remaining questions of the SAI were free response questions. Most students ( $n = 24$ ) reported that they believed it was important to understand key signatures “so you know what notes to play” but only one student specifically mentioned that key signatures indicate which notes are sharped or flatted. A majority of students ( $n = 16$ ) said they attempted to hear music internally even though some of those students thought the skill unimportant. Most students ( $n = 15$ ) found the instruction helpful: songs group,  $n = 7$ ; exercises group,  $n = 8$ . Among students who did not find the activities helpful, several reported that they “hate practicing.” A few students in the songs group said they never play music by ear and will never use those skills in the future. Only 10 students found instruction enjoyable: songs group  $n = 4$ , exercises group  $n = 6$ . The most common reason for lack of enjoyment was that the instruction was difficult, confusing, or boring.

#### *Research Question 4: Music Aptitude*

Were there any differential effects of music aptitude on performance achievement or student attitudes due to instruction? There were no differential effects of aptitude. Whether this was due to small sample sizes or lack of treatment effects is not known.

## Discussion of Results

### *Performance Achievement*

Before instruction, most students were comfortable and skilled performing from notation in the key of Bb (songs group  $M = 91.61\%$ , exercises group  $M = 91.54\%$ ).

During the pretest, I noticed that most students were quite uncomfortable attempting to play a familiar melody by ear. Many students had to be coaxed to continue playing. Still, pretest scores in the familiar key of Bb were modestly high (songs group  $M = 68.36\%$ , exercises group  $M = 66.67\%$ ). Pretest scores for playing a song by ear in the unfamiliar keys of Db and G were approximately 28 percentage points lower.

In each key, posttest mean song scores for the exercises group were approximately 7 points higher than pretest scores. This song improvement was without specific instruction in playing by ear, perhaps a result of test-retest gains or increased comfort with the testing procedures. Posttest mean song scores for the songs group were approximately 11 points higher than pretest song scores in Bb, and 25 points higher in Db and G. That the gains in the new keys were more pronounced than in Bb may be due to the fact that pretest scores in Bb were high compared to Db and G and, therefore, the students could achieve no higher degree of musical accuracy without substantially more instruction or practice. The results of the study appear to support earlier research (Delzell et al., 1999) that has documented familiarity of key as an influential factor in playing by ear. Analyses of the data suggest that some improvement in playing songs by ear may



occur with familiarity of key or repeated exposure to the task, but that instruction and/or practice is necessary for significant improvement.

Pretest etude scores in Bb were above 90%; therefore, I did not anticipate much improvement in sight-reading in Bb. Nevertheless, both groups improved significantly in Bb, about 5 points. Both groups also improved significantly in the new keys of Db and G. Improvement in G was about 11 points for both groups. Improvement in Db was about 10 points for the songs group and 17 points for the exercises group. Normally I might wonder about the apparent difference in improvement, but the analysis showed no statistical difference. Also, as mentioned in Chapter 4, there were two atypical Db etude scores that may have affected the results of the songs group.

*Atypical scores.* One student was exceptional in playing songs by ear, earning perfect scores on the pretest song in Bb and all posttest songs as well as above average scores on the other pretest songs. Scores on the Bb and G etudes were high. However, scores on the Db etude indicated an 18% decline from pre- to posttest. This student was without her instrument during the week of instruction in Db. Whether the performance decline was related to lesson participation, regression to the mean, or natural test variability is unknown. Fortunately, school attendance among study participants was very good, and no other students had attendance problems that might be considered related to experimental mortality.

For another student, performance scores in the keys of Bb and G, and on the Db etude pretest, were comparable to her peers. Unexpectedly, there was a decline of 45% on

the Db etude, where the student played only 6 of 34 pitches accurately on the posttest. One adjudicator noted on the score sheet, “Could not figure where student was.” Since this was a clarinetist, it was not a case of playing incorrect partials while fingering correctly; and with so few correct pitches, it was not simply a case of neglecting to observe the three flat signs in the key signature. The performance remains a mystery.

In any testing situation, the possibility exists that any score, high or low, may be affected by sampling error. Just as these two negative gain scores may have been due to chance rather than performance decline, other positive gain scores may have been due to chance rather than true improvement in skills. Nevertheless, while the data still revealed overall etude improvement for the songs group in the key of Db, one might grant that the analysis of reading improvement in Db could have been more pronounced without these two negative gain scores, the only in the entire data set.

### *Student Attitudes*

Statistically significant differences between groups were few. However, given that this research is in its infancy, two positive trends may be worth noting. Regarding perceived changes in song performance, post hoc analyses compared mean gain scores of each group to zero,  $\alpha_{PW} = .025$ . The results of the analyses suggested that students in the songs group perceived at least modest improvement in song performance,  $t(26) = 2.33, p = .028$ , while student in the exercises group did not,  $t(26) = 0.72, p = .48$ . Regarding perceived changes in etude performance, post hoc analyses compared mean gain scores of each group to zero,  $\alpha_{PW} = .025$ . Although not statistically significant, it seems that

some students in both groups may have perceived some improvement in their etude performances: songs group,  $t(26) = 1.92, p = .07$ ; exercises group,  $t(26) = 2.24, p = .03$ . It is interesting to note that the results of the performance test data support student's perceptions on the attitude survey in that only the songs group improved in playing songs by ear but both groups improved in reading etudes.

Although it seemed to be a good idea to have students assess both their pre- and posttest performances, a posttest-only attitude survey would probably have been adequate. Given the six weeks between the pre- and posttests, I do not believe students were internally consistent in their responses. Some students told me that they could not recall their perceptions of the tests and their performances, and two students simply marked all responses as "3."

The posttest-only items of the survey, Questions 25–31 and the free response questions, were enlightening. Students in the songs group felt they improved significantly in the keys of Db and G, which was encouraging. That students in the exercises group did not feel they improved may be something to consider in rehearsal planning. With the exercises group, in seeking to replicate "traditional" rehearsals, we did not make any special efforts to involve students in the rehearsal process except to present and assess factual knowledge such as fingerings and key signatures. Moreover, we did not ask higher-order level questions, offer opportunities for students to make musical choices, encourage student creativity, or otherwise promote higher-order thinking. Although we did not do these things with the songs group either, the nature of the experimental

treatment compelled problem-solving and self-evaluation. As noted by Turner (1998), problem-solving and reflection facilitate learning while automatic drill and repetition usually do not.

Students in both groups were neutral in their enjoyment of the instructional activities: songs group,  $M = 2.85$ ; exercises group,  $M = 2.80$ . Since attitude toward instruction was similar for both groups, one can probably interpret the results to mean that learning songs by ear was no more or less enjoyable than normal ensemble warm-ups. A few students in both groups wrote comments such as “I hate to practice,” which are telling.

For the songs group, lack of enjoyment might also have been due to discomfort or unfamiliarity with aural-based learning activities or feeling unsuccessful with the activities; for example, “It was kinda [sic] hard and therefore that took alot [sic] of the fun out of it” and “I’m terrible at playing songs by ear.” Some comments reflected students’ devaluation of aural perception in music reading or the skill of playing by ear: “It is not important to hear the music inside your head before playing” or “Playing from the written notes is a more important skill.” When students are taught music reading as a symbol-action skill where visual learning is emphasized and aural learning is neglected (Grunow, 2005; Mainwaring, 1951; McPherson, 1995b; Schleuter, 1997), they might not realize the importance of aural perception in music reading. When students are not taught to play by ear in band classes, they might come to the conclusion that the skill is unimportant. Further, music educators and even parents have voiced concerns about rote

learning and/or playing by ear ("How teachers view playing by ear," 1996; Kendall, 1966; Volk, 1993), which can negatively influence students' perceptions (Barger, 2001). One exceptionally skilled, high-aptitude student said that he would never again use skills in playing by ear. This is unfortunate because, as Priest (1989) recommended, we should teach all music performance skills as being "by ear."

Although the results of the attitude survey were disappointing in some ways, it is important to remember that this was one study with students in a single band. Further, the students in this band felt equally neutral about both the experimental and contact-control instructional treatments. In past experiences, with students at a variety of grade levels, I have witnessed strong enthusiasm for learning songs by ear. My regret in this study is that, due to the necessity of isolating the variable of rote-song instruction, preliminary activities such as melodic echoes (Brown, 1990; Haston, 2004) and singing songs (Bernhard, 2004; Dunlap, 1989; McDonald, 1991), which might have better prepared students for success and consequently contributed to enjoyment, had to be avoided. Further, due to research protocol, we were on a strict time schedule that might have resulted in the lessons being too fast-paced for some students. Had I planned for at-home practice, which albeit would have introduced a potential confounding variable, success and enjoyment might have been enhanced.

## Discussion of the Study

### *Validity*

Inherent in the research design were several threats to internal validity, or the possibility that something other than the treatment affected the results of the study (Campbell & Stanley, 1963; Gall, Gall, & Borg, 2003). Most potential threats, such as differential selection and compensatory equalization, were minimized through the planned methodology. However, there might have been an effect of testing in that students may have been more comfortable during the posttests than during the pretests, particularly in the song-by-ear task. Further, the song-by-ear test was the same for both the pre- and posttest.

Several threats to external validity (Bracht & Glass, 1968; Gall et al., 2003), or the extent to which the findings of this study might apply in other settings, should also be noted. The novelty effect, which occurs when the experimental treatment was effective simply because it was a change of pace from the normal practice routine, may have been a factor except that students were generally neutral toward the experimental treatment. To minimize any effect of experimenter or teacher, the cooperating band director and the researcher alternated instructing the two groups. The Hawthorne effect, which occurs when the mere fact of participation in a scientific study improves participant performance, may have been a factor. However, students were graded on behavior and effort rather than achievement, and we did not notice any extraordinary behavior during in-class instruction or related to at-home practice.

To facilitate generalizability to other settings, I made every effort to design lesson plans based on common, best practices in teaching. Explicit descriptions of the treatment were offered, including musical materials and lesson plans. In all, the teaching strategies and lesson procedures were not unusual and, I hope, well documented so that the study could be replicated.

### *The Experimental Treatment*

Learning songs by ear was a new activity for participants in the songs group. In an effort to isolate the variable of aural rote-song instruction, the experimental treatment did not include melodic echoes, singing, or visual references to a fingering chart. Although students practiced tonic patterns for approximately five minutes in each key, pattern instruction went no further. Without tonal or melodic pattern instruction as preliminary activities for learning songs by ear, many students struggled with echo playback of song phrases. Without singing as a means of checking for song memorization, it was difficult to know if problems were due to too few presentations of the song, technical performance difficulties, or unfamiliarity with the new keys. Without access to a fingering chart, we spent considerable time reminding individual students of the correct fingerings.

The time for instruction was extremely brief, only four hours in total. We needed more time to teach the songs in Bb so that students were ready for the aural transposition activities. Had we extended the time for instruction in Bb, however, students in the exercises group would probably have been bored, since the Bb exercises were not overly

challenging for them. Because time for each key was the critical variable, not number of songs or exercises learned, perhaps the time for instruction in all three keys could have been extended. For the songs group, I might have planned extra time for learning the song repertoire in Bb, and for the exercises group, additional exercises in Bb compared to Db and G. Due to limited time for instruction, there was not enough time to properly teach the Unit 3 songs, and there was no time for playing *Irish Jig* in Db or G, the only song to employ the upper tonic. Consequently, the songs learned best were within the range of a major sixth and there was insufficient time for songs that used the full octave and a half range. The exercises group, however, practiced exercises over a two-octave range, and the performance measures tested competence over a full octave. That the songs group was still able to achieve significant improvement in sight-reading may be testament to the benefits of the experimental treatment.

#### *The Contact-Control Treatment*

I made every effort to design the “traditional” treatment in accord with current best practices in instrumental music. It should be remembered, however, that I used two technique books in order to compile exercises for practicing in the keys of Bb, Db, and G so that there would be enough exercises to fill 60 minutes of instructional time. Further, the lessons were organized so that students practiced three days, or 60 minutes, before moving on to a new key. This type of scheduling – blocked scheduling – is known to enhance initial skill acquisition (Sanders, 2004; Shea & Morgan, 1979; Turner, 1998) but is not inherent in the design of either *Standard of Excellence Book 3* (Pearson, 1996) or *I*



*Recommend* (Ployhar, 1972), the two books used in this study. Had we simply practiced exercises from the two books in sequential order, there would not have been enough material for practice, and exercises in other keys would have been intermixed with the keys under study. As Kohut (1992) reminds us, we cannot expect a book to teach our students. Only with planning and organization is any method or technique book effective. However, since many teachers employ exercises in a method or technique book in the order presented, my intended “traditional” treatment may not have reflected fully the instructional practices of some teachers.

### *Weaknesses and Limitations*

Several weaknesses or limitations of the study are evident, some resulting from my decision to focus attention on a manageable number of dependent variables and others due to seeking to minimize experimental risk.

1. In selecting the melody for the pre- and posttests, and in an effort to be time-efficient in testing, I chose a song that was familiar to most students and, therefore, would require minimal instruction. Further, to insure that the pre- and posttest melodies were comparable, I opted to use the same song for both tests, creating a potential test-retest effect. Testing play-by-ear skills using two unfamiliar melodies might have minimized threats to validity due to testing.

2. In selecting materials for sight-reading, I wanted to measure performance in the three keys practiced during instruction. Consequently, I composed etudes specifically for this purpose. Although I pilot-tested the etudes and concluded that they had excellent

content validity and reliability, use of a published, standardized test would have added to the interpretability of the study results. Follow-up research might employ the WFPS (Watkins & Farnum, 1954) or an adaptation of it.

3. The skills of interest in this study were playing by ear and performing from music notation. The performance tests did not include prepared etudes, for reasons of time and experimental control. However, among students in grades 7–9, McPherson (1995–1996) reported only a moderate relationship ( $r = .31$ ) between abilities in performing rehearsed music and sight-reading. Consequently, my decision to limit the music reading test to sight-reading gives an incomplete picture of students' skills. Delzell (1989) included etudes read at sight, etudes learned with teacher assistance, and etudes learned without teacher assistance. Other researchers, similarly, have included in their studies tests of both sight-reading and prepared music (e.g., Haston, 2004; McPherson, 1995a, 2005; Price et al., 1998). Follow-up research to this study ought to do the same.

4. The posttests included measures of skill acquisition (song-by-ear test) and skill transfer (sight-reading test) but did not include a measure of skill retention (a delayed performance test). Research has suggested that low contextual interference and blocked scheduling of tasks build initial skill acquisition, but high contextual interference and random scheduling of tasks facilitate skill retention and transfer (Sanders, 2004; Shea & Morgan, 1979; Turner, 1998). Investigation of these phenomena as they apply to the experimental and contact-control treatments of this study is needed. Rarely has music

research considered retention of skills or knowledge, with studies by Garofalo and Whaley (1979) and Schallock (2004) among the exceptions to this trend.

5. Pitch production, regardless of intended pitch or the use of correct fingerings/positions, was evaluated by adjudicators listening to audio recordings. It is possible that some participants had cognitive understanding of which notes to play but that their performances, due to problems of tone production, did not reflect this learning. Possibilities for measuring knowledge of new fingerings/positions and key signatures include the use of a written test or evaluation based on videotaped performances.

6. All instruction took place in a group setting and students were not asked to practice at home. Students who might have benefited from individual, at-home practice, or simply more time on task, may not have had adequate time for learning. Although adding the variable of at-home practice would have posed some experimental risk, it might more realistically have reflected the potential of the experimental and traditional treatments.

Because this was initial research on an untested method of instruction, I thought it best to concentrate my efforts on the three dependent variables of playing by ear, sight-reading, and student attitudes. In doing so, however, I neglected to measure skills in performing rehearsed music, skill retention, aural skills, and music knowledge of fingerings/positions and key signatures. Another weakness or limitation of the study resulted from a desire to control extraneous variables, such as the variable of at-home practice. In delimiting a small number of dependent variables, I was able to complete the

posttests in a timely manner and focus attention on the most readily visible effects of instruction. However, follow-up research will need to address other potential effects, especially those related to the underlying motivation for the experimental treatment, which is the improvement of reading skills through aural-skills development.

#### Interpretation and Significance of the Study

This study examined learning songs by ear in multiple keys. The results of the study showed that band students improved their skills in playing by ear and sight-reading. Although the results are encouraging, they should be interpreted in view of its sample size and population, large effect sizes for gains in performing by ear in newly learned keys and medium effect sizes for gains in sight-reading, and moderate statistical power. Replication is needed to confirm or reject the apparent effects of the treatments among middle school band students, and follow-up research could include musicians of other ages and instruments as well as tests of skill retention.

It is counterintuitive that students who did not read in the new keys of Db and G achieved scores on a test of sight-reading that were as high as those who did read in the new keys. Perhaps the critical variables of the study were not learning songs by ear and practicing exercises from notation but instead concentrated instructional time devoted to study in the new keys. Moreover, with achievement in the new keys reaching only at or below the 82<sup>nd</sup> percentile, there is ample room for musical improvement. Given a longer period of time for treatment, it is possible that the experimental instruction would not be strong enough to facilitate reading skills above this level. Optimally, the length of

treatment would enable contact-control group posttest scores in Db and G equal to scores in Bb so that the limits of the experimental treatment might be learned,

This study isolated the variable of aural rote-song instruction. Important preinstruction activities such as singing and pattern training (e.g., Bernhard, 2004; Brown, 1990; Haston, 2004; MacKnight, 1975) and postinstruction activities such as reading and writing songs (Gordon, 2003) were neglected. Powerful supplemental instructional activities, such as learning bass lines and harmony parts (Grunow et al., 2001; Righter, 1945) were likewise not a part of the treatment. Consequently, that the experimental instruction was as successful as traditional instruction is especially noteworthy.

The fact that students in the experimental group demonstrated significant improvement in playing songs by ear in the keys of Db and G implies that musicians, with instruction or practice, can improve their skills in playing by ear and that familiarity of key enhances success. For all practical purposes, the results of the study are in accord with the findings of Wilder (1988) and Delzell, Rohwer, and Ballard (1999). Because students in both groups achieved significant gains in sight-reading, we can conclude that instructional time devoted to play-by-ear activities did not hinder learning to play from notation in new keys during the initial stages of skill acquisition. Further, free-response comments on the attitude survey suggest that teachers need not worry that encouraging students to play by ear will negatively influence motivation for performing music from notation.

The results of the study support the findings of earlier research that has documented the benefits of sound-before-sign instruction that included learning songs by rote in beginning instrumental music as preparation for music reading (e.g., Bernhard, 2004; Haston, 2004; McDonald, 1991). In expanding the population to include intermediate-level musicians, the present study suggests that rote instruction might be advantageous beyond the beginning stages of learning an instrument and may have benefits beyond preparing students for initial reading experiences. In affecting performance improvement through the practice of the musical materials of songs, in contrast to exercises, this research corroborates the work of Price, Blanton, and Parrish (1998), who found instruction based on musical materials (excerpts from band literature) equally effective as performing scales, rhythm drills, and technical exercises from published band books.

Thus, implications for pedagogy are as follows: (a) Aural-based instruction may be a positive tool for learning in the intermediate stages of instrumental study; (b) performing by ear in a new key, a type of sound-before-sign instruction, can assist students in the initial stages of learning to perform in a new key; and (c) for teaching the skill and concept of playing in a new key, isolated technical drills or specially composed studies are not the only option.

#### Suggestions for Future Research

Additional research on the topic of learning songs by ear in instrumental music is recommended.

1. A follow-up study of middle school students, but employing a bigger sample, is needed. The participants could be from a larger single band or multiple bands at several school sites. A larger sample size would also invite a possibly more representative group, and better facilitate the examination of potential differential effects among students of varied levels of music aptitude.

2. In order to examine the effects of the experimental treatment among a more diverse population of musicians at various stages of learning, future research could involve students at other levels of instruction, such as beginning or high school band participants, or even college musicians taking private lessons. Because the technical and aural requirements for pitch accuracy in playing different instruments are varied, future research might also examine the effects of the experimental treatment among musicians of other instruments, including mallet percussion, strings, and piano.

3. A follow-up study could include additional major or minor keys. With the dearth of minor-key songs/exercises in method and technique books and young-band repertoire, it would be interesting to compare practicing minor scales and exercises with learning songs by ear in minor. In American music, aural familiarity in major tonality is much stronger than for minor tonality. Hypothesizing that songs offer a more vivid aural image than scales and exercises, meaning that it is easier to discern wrong notes in a familiar song than in an exercise, I would conjecture that the strength of the experimental treatment might be magnified in the minor keys.

4. To build on the research of Luce (1965), McPherson (1995–1996), and Bernhard (2004), which has documented a significant relationship between the skills of playing by ear and sight-reading, replications of the present study should include a calculation of the correlation of play-by-ear and sight-reading test scores.

5. The students in this study had little to no previous experiences in aural-based musical performance on their band instruments. A study of middle school students who are involved in a band curriculum that already includes some types of aural instruction, such as tonal or melodic pattern training, might assure that the students are prepared for learning songs by ear and that the full benefits of rote-song instruction are realized.

6. The experimental treatment of this study facilitated ears-hands coordination while the contact-control treatment facilitated eyes-hands coordination. A longer period of instruction might allow time for the experimental group to read songs learned by ear in notation and thereby facilitate ears-eyes-hands coordination. An aural component could be added to the contact-control treatment so that it similarly facilitates ears-eyes-hands coordination.

7. A longer period of treatment might allow the full benefits of the experimental treatment to impact skills in audiation. A replication study over a semester or full year of instruction could include pre- and postinstruction tests of notational audiation.

#### Playing by Ear and Music Reading: A Possible Connection

Although the present study compared the effects of learning songs by ear and practicing exercises, my thoughts are not that one instructional technique is superior to



the other but that learning songs by ear can enhance other activities in rehearsal. In this study, learning songs by ear in two new keys appeared to contribute to student success in performance from notation in those two keys as much as did traditional instruction employing scales and technical exercises. Learning songs by ear may have other as of yet unmeasured benefits as well.

I believe that learning songs by ear contributes to developing skills in pitch internalization and audiation. Teachers of college ear-training classes have voiced similar opinions (Brown, 1990; Covington, 1992; Karpinski, 2000; Thackray, 1975), and at least one study has documented a relationship between aural-skills grades and playing by ear (Wilder, 1988). Skills in pitch internalization and audiation, which facilitate musical anticipation and prediction (Gordon, 2003), might then aid musicians in performing within the notated key signature. Sloboda (1976) observed the powerful effects of musical inference among musicians performing an unfamiliar score in a familiar tonal style, and Wolf (1976) reported the phenomenon of proofreader's error in music. This literature suggests the influence of aural perception in performing from notation.

✓  
/ Gordon (2003) and Grunow (in Casey, 1993) have opined that practicing scales and exercises aids in developing instrumental technique but does little to develop skills in audiation. I speculate that technical fluency is especially important in fast passages, but since such passages are infrequent in middle school band literature, developing the ability to play fast scales and arpeggios is perhaps less important than developing the ability to audiate tonality (e.g., Gordon, 2003; Grunow, 2005), predict and anticipate musical

events (Gaynor, 1995; Walters, 1989), and self-correct (Nuttall, 2004). Whether the benefits of learning songs by ear would extend to musicians beyond the intermediate-level stages of instruction should be investigated.

### Concluding Thoughts

Based on personal musical and teaching experiences, a review of the literature, and the positive results of this study, I conclude that learning songs by ear merits consideration as follows:

1. Performing music from notation should be considered a visual-aural-motor task (Mainwaring, 1951) involving eyes-ears-hands coordination (McPherson & Gabrielsson, 2002). Learning songs by ear may be one means of strengthening aural skills (Brown, 1990; Covington, 1992; Karpinski, 2000; Thackray, 1975) and perhaps ultimately facilitating instrumental music reading. The results of the present study are in accord with this theory.

2. Aural-based learning activities prepare students for music reading (e.g., Bernhard, 2004; Grutzmacher, 1987; Haston, 2004; MacKnight, 1975) but ought not preclude music reading (Gordon, 2003; Kendall, 1966). This study included instruction in learning songs by ear, but given the importance of music reading for ensemble musicians, posttests measured the effects of instruction on music reading. The results of the present study demonstrated that students who learned songs by ear sight-read as well as students who practiced exercises from notation.

3. The National Standards in Music encourage learning a diverse repertoire of music both visually and aurally, and engaging in musically creative activities such as improvisation (MENC, 1996). In multiple studies, McPherson (1995–1996, 2005) has offered empirical evidence suggesting the value of a curriculum that includes attention to visual, aural, and creative musical performance activities. Learning songs by ear qualifies as an aural performance activity, which has been advised by McPherson and others (e.g., Froseth, 2000; Grunow et al., 2001; Priest, 1989).

The results of this study suggest that a well-rounded instrumental curriculum that includes learning songs by ear and aural transposition may be beneficial. Learning songs by ear is advocated by expert teachers, is in harmony with earlier research, and is supported by the National Standards in Music. Additionally, implementation of a song-by-ear curriculum may enable the teaching of selected skills and concepts through music rather than isolated technical exercises.

Even with a short period of treatment, positive effects of learning songs by ear were documented in this study. Whether this trend was due solely to instruction, or due in part to repetitive musical performance of any kind in new keys, is not known. A longer period of treatment would help to answer this question. As with any single study, experimental replication is needed before making unequivocal recommendations. Nevertheless, the results of the study suggest that learning songs by ear and aural transposition may be valuable activities in instrumental music.

APPENDIX A  
STUDENT AND PARENT PERMISSION FORMS

11

## LETTER OF RECRUITMENT AND ASSENT

August 24, 2005

Dear BAND STUDENT,

My name is Ann Musco and I conduct the concert band at the University of Alaska–Fairbanks. I am also a student at the University of Oregon, where I am working on my dissertation. The ultimate goal of this project is to improve how we teach in band classes. Because your participation in this project is vital to its success, I am writing to ask for your assistance!

For one month this term, several times a week, you will be involved in specific rehearsal activities designed to improve skills in music reading. In order to compare two different teaching methods, we will divide the band into two groups. Mrs. xxxxxxxxxx and I will alternate teaching the two groups. Whatever your group assignment, I believe that you will find the activities both musically beneficial and enjoyable. Your participation in these special rehearsal activities will count as part of your fall term band grade. If you give excellent effort and participate positively, you will earn an “A” for this portion of your fall term grade.

If you choose to participate in my dissertation study, you will be involved in several additional activities, all of which will also take place during regularly scheduled band classes. First, you will complete a short, confidential questionnaire about your musical background. Then you will take a portion of a listening test call the *Advanced Measures of Music Audiation* so that I can learn a little bit more about your musical skills. At the conclusion of our time together, I will ask for your comments about the instruction you received: Did you enjoy the activities? Do you feel they were helpful? And so on.

If you choose to participate in the study, I will want to know your playing skills before and after instruction so that I can hear how much you improved. Therefore, you will be asked to play a short pretest and a short posttest. These performance tests will consist of sight-reading three brief melodies and playing a familiar song by ear (without written music) in several keys. In order for me to privately audiotape your performances on my computer, you will be excused for about 12 minutes from band class to play your melodies and songs. Because several judges will later score your performances, you must consent to be audiotaped in order to participate in the study.

For this study, your identity will remain confidential. That is, the judges will not know who is playing on the recording and your name will not appear in my write-up. I hope you will not be shy or nervous about playing for me. Remember, any opportunity for performance helps us to grow as musicians.

If you choose not to participate in the study, you will participate in the curriculum activities but you will not be recorded and you will not need to complete the questionnaires. Your academic grade will not be affected but you may be given an independent study project to complete while other students are taking the dissertation tests and questionnaires.

Your participation in the tests and questionnaires is completely voluntary, and will not affect your music grade or your relationship with your school band director. If you have any questions, please contact me at xxx-xxxx or [ann.musco@uaf.edu](mailto:ann.musco@uaf.edu). To participate, please sign your name where indicated, and have your parent/guardian sign where indicated as well. Of course, you may withdraw from the study at any time without penalty.

I look forward to working with you, and I thank you for your help!

Sincerely,

Ann Musco  
Assistant Professor of Music  
University of Alaska–Fairbanks  
907-xxx-xxxx or [ann.musco@uaf.edu](mailto:ann.musco@uaf.edu)

I volunteer to participate in Ms. Musco's dissertation study as described above:

Name of participating student \_\_\_\_\_  
Signature of participating student \_\_\_\_\_  
Date \_\_\_\_\_

Do you have any questions or comments about the study?

If so, please ask me in class or write your question(s)/comment(s) here. ☺

\_\_\_\_\_

\_\_\_\_\_

## LETTER OF RECRUITMENT AND INFORMED CONSENT

August 24, 2005

Dear BAND PARENT,

My name is Ann Musco and I conduct the concert band at UAF. I am also a student at the University of Oregon, where I am working on my dissertation, and so I am writing to ask permission for your child's participation in my study.

For one month this term, all students in the Concert Band will be involved in specific rehearsal activities designed to improve skills in music reading. In order to compare two different teaching methods, we will divide the band into groups matched according to instrumentation and other factors. Mrs. xxxxxxxxx and I will alternate teaching the two groups. It is anticipated that students in both groups will benefit from the instruction received, and I believe students will enjoy our time together. Since these learning activities are part of the regular band class, students will earn credit toward their fall term band grade through positive participation.

Students who elect to participate in the study will also take a music listening test, perform two short playing tests, and complete two confidential questionnaires. Students will be excused briefly from band rehearsal to play their performance tests. Students who elect not to participate in the study (the pre- and posttests) will not be penalized in any way, but may be given an alternate independent study project while the dissertation participants complete the study questionnaires and listening test.

For study participants, the performance tests include private audiotaping of six short musical examples. The recordings will be made directly onto a laptop computer, and are necessary for full participation in the study. During recording, students will be identified by number rather than by name. To verify that instruction was implemented as planned, *each teacher* will be videotaped two times during the study. Additional details about the study can be found in the attached letter to students.

Your child's participation is voluntary and confidential. Students will be assigned a study identification number so that all testing information is known only to Mrs. xxxxxxxxx and the researcher. The code list will be retained by the researcher only until the data have been analyzed, or approximately six months.

If you have any questions about the study, please contact me at [ann.musco@uaf.edu](mailto:ann.musco@uaf.edu) or xxx-xxxx.

You may also contact my dissertation advisor: Dr. Harry Price, School of Music, 1225 University of Oregon, Eugene OR 97403-1225, 541-346-3777, or hprice@uoregon.edu. If you have questions regarding your rights as a research subject, contact the Office of Human Subjects Compliance, University of Oregon, Eugene, OR 97403, 541-346-2510.

Your signature on the reverse of this letter indicates that you have read and understand the information provided above; that you willingly agree to your child’s participation; that you will receive a copy of this form if you request it; and that you are not waiving any legal claims, rights, or remedies. Participants may withdraw from the study (the pre- and posttesting) at any time without penalty.

As a public school teacher for more than ten years, I sought to employ the best teaching strategies I knew. With this dissertation and the wonderful contributions of Mrs. xxxxxxxxx and the students, I hope to scientifically document the effects of two of those teaching strategies and make a contribution to pedagogy.

I look forward to working with your son/daughter on this project, and I thank you for support. Again, please feel free to contact me at any time should you have questions, comments, or concerns about the study. Thank you!

Sincerely,

Ann Musco  
Assistant Professor of Music  
University of Alaska–Fairbanks  
907-xxx-xxxx  
ann.musco@uaf.edu

I consent to my child’s participation in the dissertation study as described:

Name of parent or legal guardian \_\_\_\_\_  
Signature of parent or legal guardian \_\_\_\_\_  
Date \_\_\_\_\_

I have questions about the study. Please telephone me:

Name of parent/guardian \_\_\_\_\_  
Telephone \_\_\_\_\_  
Best time to call \_\_\_\_\_



APPENDIX B  
SONG-BY-EAR PRE/POSTTEST

✓

## Song-by-Ear Pre/Posttest

Name of Adjudicator \_\_\_\_\_

Student ID \_\_\_\_\_

Circle each pitch misplayed by the performer.  
You may listen to the recording as many times as you wish.  
Pitch accuracy ("correct notes") is the only attribute of measurable interest.  
Intonation and rhythm are not attributes of interest during this performance test.



APPENDIX C  
SIGHT-READING ETUDES

## Sight-Reading Etudes

Xa



Xb



Xc



Ya



Yb



Yc



APPENDIX D  
ETUDE COMPARABILITY FORM

Dear Adjudicator,

Thank you for your expert opinion on the content of these etudes, which are intended to be of equal performance and musical difficulty.

Here is a brief description of the areas of concern while composing the etudes:

Number of pitches	Each 8-measure etude includes 31–35 nonrepeated pitches.
Rhythm	The etudes use half, quarter, and paired-eighth notes.
Range	The etudes encompass a range of a minor tenth, from the seventh degree of the scale below tonic to the ninth degree of the scale above tonic.
Interval content	The etudes comprise scalar melodic motion as well as small skips within the underlying I, IV, and V <sup>7</sup> harmonies.
Harmony/Phrasing	The 8-measure etudes include two 4-measure phrases. Each phrase has a final cadence on the tonic triad, and the second phrase has a harmonic rhythm identical to the first. The rate of harmonic change is one chord per measure for three of the four measures of each phrase, and two chords per measure on the other measure of the phrase. Each etude includes a total of four or six beats over a subdominant triad. Three different harmonic plans are employed, with one plan for Xa and Ya, one for Xb and Yb, and one for Xc and Yc.

Please review the etudes and complete the questionnaire on the reverse side of this page. After signing the questionnaire, please mail it to me in the enclosed return envelope.

Thank you!

Sincerely,

Ann Musco  
 907-xxx-xxxx  
 ann.musco@uaf.edu

## ETUDE COMPARABILITY FORM

For each pair of statements, check ONE box and include any relevant comments.

- All six etudes appear to be of equal difficulty in terms of rhythm.
- I have concerns here. Comment on which etudes (and measures thereof) appear to be more or less difficult than the rest.
  
- All six etudes appear to be of equal difficulty in terms of range.
- I have concerns here. Comment on which etudes (and measures thereof) appear to be more or less difficult than the rest.
  
- All six etudes appear to be of equal difficulty in terms of interval content.
- I have concerns here. Comment on which etudes (and measures thereof) appear to be more or less difficult than the rest.
  
- All six etudes appear to be of equal difficulty in terms of harmony.
- I have concerns here. Comment on which etudes (and measures thereof) appear to be more or less difficult than the rest.
  
- All six etudes appear to be of equal difficulty in terms of phrase construction.
- I have concerns here. Comment on which etudes (and measures thereof) appear to be more or less difficult than the rest.

Other Comments

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Signature \_\_\_\_\_

Date \_\_\_\_\_

APPENDIX E  
INSTRUCTIONS FOR ADJUDICATORS



## INSTRUCTIONS FOR ADJUDICATORS

Thank you so much for adjudicating!

Enclosed is the listing of tracks on each CD, plus the score sheets. On your score sheets, I have noted the instrument that should be playing.

You may listen to the recordings in any order you wish, although I recommend listening to each group of recordings (songs or etudes in one key) before moving on to another task.

You may listen to each track as many times as you wish.

For each performance, circle any pitches misplayed by the performer. Also circle any pitch not played, even if it is a repeated pitch.

Pitch accuracy (i.e., “correct notes”) is the only factor of measurable interest.

Intonation and rhythm are not of interest during this performance test. Consequently, if a student pauses or misplays a rhythm, it does not affect the score unless it takes more than 45 seconds to play the song or etude. I have already confirmed that there are no excessively long recordings, so you do not need to be concerned.

If you find specific tracks especially difficult to score, draw an asterisk near the clef sign, but still circle, to the best of your ability, any misplayed pitches.

An addressed envelope plus postage money is included for the return of the scoring sheets. I will retrieve the CDs from you next time we meet in person.

Again, thank you so much for your time listening to these recordings!

APPENDIX F  
STUDENT BACKGROUND SURVEY

**Student Background Survey (SBS)***All information on this form is confidential.*

Your Name \_\_\_\_\_

Grade in School \_\_\_\_\_

Instrument in Band \_\_\_\_\_

- |     |   |     |   |   |   |   |    |
|-----|---|-----|---|---|---|---|----|
| 1a. | In what grade did you begin playing this instrument?  | 3   | 4 | 5 | 6 | 7 | 8  |
| 1b. | Do you play any other instruments?  | YES |   |   |   |   | NO |
| 1c. | If yes, what other instruments do you play? For how long?   |     |   |   |   |   |    |
| 2a. | Do you take, or have you taken, private lessons on a band instrument?   | YES |   |   |   |   | NO |
| 2b. | If yes, for how long?   |     |   |   |   |   |    |
| 3a. | Do you take, or have you taken, private lessons on piano?   | YES |   |   |   |   | NO |
| 3b. | If yes, for how long?   |     |   |   |   |   |    |
| 4a. | Do you play in any other instrumental ensembles besides Concert Band?   | YES |   |   |   |   | NO |
| 4b. | If yes, which ensemble(s) and for how long?   |     |   |   |   |   |    |
| 5a. | Have you attended any summer music camps?   | YES |   |   |   |   | NO |
| 5b. | If yes, which camp(s) and for how long?   |     |   |   |   |   |    |
| 6a. | Do you sing, or have you sung, in any choirs?   | YES |   |   |   |   | NO |
| 6b. | If yes, what choir(s) and where? For how long?  |     |   |   |   |   |    |
| 7.  | Is there anything else about your music background that I should know?<br>If yes, please explain. Use reverse side of page if needed. | YES |   |   |   |   | NO |

Additional student comments here, please.

TEACHER USE ONLY

Name \_\_\_\_\_

Study ID # \_\_\_\_\_

Instrument \_\_\_\_\_

AMMA Tonal \_\_\_\_\_

AMMA Rhythm \_\_\_\_\_

AMMA Composite \_\_\_\_\_

AMMA Rank \_\_\_\_\_

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Lessons            A        B        C        0

Ensembles        A        B        C        0

Group            A        or        B

APPENDIX G  
STUDENT ATTITUDE INVENTORY

**Student Attitude Inventory (SAI)**

*This questionnaire is confidential.*  
**before instruction = PRETEST**

ID/Name
---------

1. During your pretest, was it easy or difficult for you to play <i>Row, Row, Row Your Boat</i> by ear in Bb concert?	easy 1    2    3    4    5	difficult
2. How about <i>Row, Row, Row Your Boat</i> in G concert?	easy 1    2    3    4    5	difficult
3. How about <i>Row, Row, Row Your Boat</i> in Db concert?	easy 1    2    3    4    5	difficult
4. Rate your <i>pretest</i> performance of <i>Row, Row, Row Your Boat</i> in Bb concert.	poor 1    2    3    4    5	excellent
5. Rate your <i>pretest</i> performance of <i>Row, Row, Row Your Boat</i> in G concert.	poor 1    2    3    4    5	excellent
6. Rate your <i>pretest</i> performance of <i>Row, Row, Row Your Boat</i> in Db concert.	poor 1    2    3    4    5	excellent
7. During the pretest, was it easy or difficult for you to play the etude in Bb concert?	easy 1    2    3    4    5	difficult
8. How about the etude in G concert?	easy 1    2    3    4    5	difficult
9. How about the etude in Db concert?	easy 1    2    3    4    5	difficult
10. Rate your <i>pretest</i> performance of the etude in Bb concert.	poor 1    2    3    4    5	excellent
11. Rate your <i>pretest</i> performance of the etude in G concert.	poor 1    2    3    4    5	excellent
12. Rate your <i>pretest</i> performance of the etude in Db concert.	poor 1    2    3    4    5	excellent

**Student Attitude Inventory (SAI)***This questionnaire is confidential.***after instruction = POSTTEST**

ID \_\_\_\_\_

13. After instruction, was it easy or difficult for you to play <i>Row, Row, Row Your Boat</i> by ear in Bb concert?	easy 1	2	3	4	difficult 5
14. How about <i>Row, Row, Row Your Boat</i> in G concert?	easy 1	2	3	4	difficult 5
15. How about <i>Row, Row, Row Your Boat</i> in Db concert?	easy 1	2	3	4	difficult 5
16. Rate your <i>posttest</i> performance of <i>Row, Row, Row, Your Boat</i> in Bb concert.	poor 1	2	3	4	excellent 5
17. Rate your <i>posttest</i> performance of <i>Row, Row, Row Your Boat</i> in G concert.	poor 1	2	3	4	excellent 5
18. Rate your <i>posttest</i> performance of <i>Row, Row, Row Your Boat</i> in Db concert.	poor 1	2	3	4	excellent 5
19. After instruction, was it easy or difficult for you to play the etude in Bb concert?	easy 1	2	3	4	difficult 5
20. How about the etude in G concert?	easy 1	2	3	4	difficult 5
21. How about the etude in Db concert?	easy 1	2	3	4	difficult 5
22. Rate your <i>posttest</i> performance of the etude in Bb concert.	poor 1	2	3	4	excellent 5
23. Rate your <i>posttest</i> performance of the etude in G concert.	poor 1	2	3	4	excellent 5
24. Rate your <i>posttest</i> performance of the etude in Db concert.	poor 1	2	3	4	excellent 5
25. My ability to play in the key of G concert has improved.	not at all 1	2	3	4	a lot 5
26. My ability to play in the key of Db concert has improved.	not at all 1	2	3	4	a lot 5
27. Our class practice time helped my playing.	not at all 1	2	3	4	a lot 5
28. Our class practice time helped my ears.	not at all 1	2	3	4	a lot 5
29. I enjoyed our class practice activities.	not at all 1	2	3	4	a lot 5
30. I would like to do more of this in other keys.	no 1	2	3	4	yes 5
31. I would recommend this activity to a band friend.	no 1	2	3	4	yes 5

32. When you sight-read a new piece of music, do you look at and understand the key signature?  
Yes or No? Do you think this knowledge is important? Why or why not?

33. When you read music, do you try to hear the piece inside your head before you play it? Yes or No?  
Do you think this skill is important? Why or why not?

34. Were the practice activities helpful to you? Yes or No?  
Please comment. Try to be as specific as possible.

35. Were the practice activities enjoyable for you? Yes or No?  
Please comment. Try to be as specific as possible.

36. Here, please make any additional comments you have about our class practice activities. Thank you! ☺



APPENDIX H  
INTRODUCTORY LESSON

## Introductory Lesson: Both Groups Together

### Lesson Objectives:

Students will learn or review the fingerings/positions for the pitches of all three scales.  
 Students will learn or review the key signatures for all three scales.  
 Students will learn or review steps and skips in music.  
 Students will learn the term “tonic pattern” and the notes of the tonic triad.

### Lesson Notes:

Researcher leads activities from the podium.  
 Cooperating teacher assists individual students as necessary.

The abbreviation SR stands for student response. Italicized passages are teacher talk.

The lesson will last about 25 minutes.

### Lesson Procedures:

1. Be certain all students know which instrument group they are in:

*Flutes, trombones, tuba, and mallet percussion – you are in the C-instrument group. Clarinets and trumpets – you are in the Bb-instrument group. Saxes – you are in the Eb-instrument group.*

2. Learn or review the key signature of the Bb-concert scale:

*Everyone, look at Line 1 on your handout. Notice that the scale goes up one note higher than the octave and goes down one note lower than the octave.*

*Raise your hand if you have two flats in your key signature. SR.*

*Raise your hand if you have no flats or sharps in your key signature. SR.*

*Raise your hand if you have one sharp in your key signature. SR.*

3. Name the notes of the Bb-concert scale:

*C-instrument group, you have two flats in your key signature. (Teacher draws key signature on the white board.) You must play all Bs as B-flats and all Es as E-flats. Please say the note names of your scale while fingering along as if you were going to play the scale aloud.*

SR: Bb C D Eb F G A Bb C Bb A G F Eb D C Bb A Bb

Repeat with the Bb and Eb instruments.

4. Time for additional student questions, reviewing fingerings/positions as needed:

*Does anyone have any questions about the fingering or slide position for any of these notes? Help students as necessary.*

5. Read and perform the Bb-concert scale:

*All together: Play the Bb-concert scale while reading from Line 1.  
Band plays the scale in whole notes at quarter note equals 60.  
Band then plays the scale in quarter notes at quarter note equals 60.*

6. Learn or review the key signature for the Db-concert scale:

*Everyone, look at Line 2 on your handout. Notice that the scale goes up one note higher than the octave and goes down one note lower than the octave.*

*Raise your hand if you have five flats in your key signature. SR.  
Raise your hand if you have three flats in your key signature. SR.  
Raise your hand if you have two flats in your key signature. SR.*

7. Name the notes of the Db-concert scale and perform the scale in groups:

*C-instrument group, you have five flats in your key signature. (Teacher draws key signature on the white board.) You must play all Bs, Es, As, Ds, and Gs as flatted notes. Please say the note names of your scale while fingering along as if you were going to play the scale aloud.*

SR: Db Eb F Gb Ab Bb C Db Eb Db C Bb Ab Gb F Eb Db C Db

*All C-group instruments, let's be certain we know the fingerings for Db and Gb.  
Teacher helps as needed.*

*Good work. Now let's play that scale.*

*C-instrument group plays the scale in half notes at quarter note equals 60.*

Repeat with the Bb and Eb instruments.

8. Time for additional student questions, reviewing fingerings/positions as needed:

*Does anyone have any questions about the Db-concert scale for their instrument?*  
Answer any questions.

9. Read and perform the Db-concert scale:

*All together: Play the Db-concert scale while reading from Line 2.*  
Band plays the scale in whole notes at quarter note equals 60.  
Band then plays the scale in quarter notes at quarter note equals 60.

10. Learn or review the key signature for the G-concert scale:

*Everyone, look at Line 3 on your handout. Notice that the scale goes up one note higher than the octave and goes down one note lower than the octave.*

*Raise your hand if you have one sharp in your key signature. SR.*  
*Raise your hand if you have three sharps in your key signature. SR.*  
*Raise your hand if you have four sharps in your key signature. SR.*

11. Name the notes of the G-concert scale and perform the scale in groups:

*C-instrument group, you have one sharp in your key signature. (Teacher draws key signature on the white board.) You must play all Fs as F-sharps. Please say the note names of your scale while fingering along as if you were going to play the scale aloud.*

SR: G A B C D E F# G A G F# E D C B A G F# G

*All C-group instruments, let's be certain we know the fingering for F#.*  
Teacher helps as needed.

*Good work. Now let's play that scale.*  
C-instrument group plays the scale in half notes at quarter note equals 60.

Repeat with the Bb and Eb instruments.

12. Time for additional student questions, reviewing fingerings/positions as needed:

*Does anyone have any questions about the G-major scale for their instrument?*  
Answer any questions.

13. Read and perform the G-concert scale:

*All together: Play the G-concert scale while reading from Line 3.  
Band plays the scale in whole notes at quarter note equals 60.  
Band then plays the scale in quarter notes at quarter note equals 60.*

14. Learn or review steps versus skips in music:

*Let's go back to the key of Bb-concert. Please play the first five notes of the scale. SR. When we go straight up or down the scale, without skipping any notes, this is called stepping. Step patterns in music go directly up or down the scale, like Bb-C-D-C-Bb or line-space-line-space on the music staff. Step patterns are scale patterns. [Teacher plays example on piano.]*

*Still in Bb concert. please play the first, third, and fifth notes of the scale. SR. When we skip one or more notes of the scale, this is called skipping, like Bb-D-F-D-Bb. [Teacher plays example on piano.] Skip patterns in music often go up or down a triad or chord. Next time we meet, you will learn tonic-triad patterns, which are an example of skip patterns in music.*

15. Assess student comprehension:

*I will notate four patterns on the white board. Tell me which patterns are step patterns and which patterns are skip patterns. SR.*

*I will play for you four patterns on the piano. Tell me which patterns are step patterns and which patterns are skip patterns. SR.*

16. Verbal wrap-up:

*Thanks for your attention today, band. We realize that this was new for some and review for others, and we appreciate your cooperation. We'll begin working in our two experiment groups on Monday.*



APPENDIX I  
SONG REPERTOIRE FOR SONGS GROUP





## Lightly Row



## Skip to My Lou

Musical notation for the piece "Skip to My Lou". It consists of four staves of music in G major (one flat) and 2/4 time. The first staff contains the first four measures, the second staff contains the next four measures, the third staff contains the next four measures, and the fourth staff contains the final four measures, ending with a double bar line.

## Santy Maloney



## Alouette



## Irish Jig



APPENDIX J

TONIC PATTERNS FOR SONGS GROUP

## Instructions for Teaching the Tonic Patterns

Day 1 of Weeks 1, 2, and 3 of instruction:

In the key of the week, teach Lines 1 and 2 of the Pattern Sheet.

These are 1-3-5 tonic patterns.

Day 2 of Weeks 1, 2, and 3 of instruction:

In the key of the week, teach Lines 3 and 4 of the Pattern Sheet.

These patterns add the upper octave tonic and the lower dominant.

## Suggested Script for Teaching the Tonic Patterns

- Songs Group Day 1

*Play for me the first note of the scale.*

Teacher plays pitch on the piano and holds up one finger. SR.

*Play for me the third note of the scale.*

Teacher plays pitch on the piano and holds up three fingers. SR.

*Play for me the fifth note of the scale.*

Teacher plays pitch on the piano and holds up five fingers. SR.

*When we find patterns made up of just these three notes of the scale, in any octave, we call this a tonic pattern. We have the lowest pitch of the tonic triad (play on piano and have students match on their instruments), the middle pitch of the tonic triad (play on piano and have students match on their instruments), and the highest pitch of the tonic triad (play on the piano and have students match on their instruments).*

*Please echo-play the tonic patterns I play for you on the piano.*

SR: Perform Lines 1 and 2 of the Pattern Sheet.

- Songs Group Day 2

*Play for me the first, third, and fifth notes of the scale as we learned them last time. Now play the upper octave tonic of the scale. That will be the upper note Bb-concert, whatever that is for your instrument. Here are some new tonic patterns that will include that note. Echo-play the tonic patterns I play for you on the piano.*

SR: Perform Line 3 of the Pattern Sheet.

*Now we will add a lower pitch of the tonic triad. See if you can find this note on your instrument. [Teacher plays lower dominant on the piano and students match. Assist*

students having difficulty.] *Echo-play these tonic patterns that will include the lower note we just learned.*

SR: Perform Line 4 of the Pattern Sheet.

*Thinking of all of the notes of the tonic triad that we have learned, let's repeat all of the patterns we learned today.*

SR: Perform Lines 3 and 4 of the Pattern Sheet.

*Terrific! In the songs that we'll learn, you will hear passages that consist only of skips within the tonic triad. When I point out such a passage, remember that your choice of notes is those notes that we have been using today.*

Line 1



Line 2



Line 3



Line 4



APPENDIX K  
TEACHING PROCEDURES FOR SONGS GROUP

## Teaching a Song by Ear: General Principles

In preparation for teaching and guiding students toward success, the idea of the proposed song lesson plans is to help students figure out the melody on their own as much as possible. This not only facilitates performance accuracy, it most likely results in longer-term learning. Questions such as “Does this phrase go up or down?” are excellent, as are activities such as having the teacher play on the piano the first pitch of a phrase until the students match it on their instruments.

When teaching a song by rote for instrumental performance, a combination of the whole-song and phrase methods usually works best. The first time a song is presented, play the melody through in its entirety, giving the students something specific to listen for or do. Students may need to hear the entire melody several times before instruction that breaks the song into phrases and before attempting instrumental performance. Then, depending on the length and complexity of the song, present phrases or mini-phrases of the song, eventually combining phrases until the song is performed in its entirety.

Remember that we are aiming to teach for audiation, not imitation or simple memorization. Therefore, the teacher should not sing or say passages of the song using scale-degree numbers or tonal syllables, nor should the teacher ask the students to do so. That said, comments such as “This phrase begins on the third note of the scale” can be positively effective, particularly after students have attempted on their own to find a certain structural pitch.

Allow plenty of time for memorization and audiation. Having students sing a song before playing it on their instruments is the best means of assessing whether the students have memorized the song. To avoid introducing singing as a potential confounding variable in this study, alternate methods of assessing aural comprehension will be employed. One method will be to think through the melody while fingering/sliding along, as if playing the song on an instrument.

Other tips for rote-song teaching:

- ✓ Provide motivation for learning a new song – develop a sense of expectancy:  
Does anyone recognize this melody? Can anyone tell us the title of this tune? This song is especially popular in France; what might it be?
- ✓ Find ways to question students about the song: How many phrases are there?  
Does this phrase move up or down? Does this phrase step or skip?

- ✓ Find ways to assess aural comprehension: With your hands, show the melodic contour of this song. Raise your hand when you hear the melody change from skipping to stepping motion.
- ✓ After most students have been successful performing a song, find opportunities for repetition: Play the song legato or staccato, soft or loud, slow or fast. Have solo or small-group performances. At the teacher's cue, have students play some phrases out loud and other phrases silently.



APPENDIX L  
LESSON PLANS FOR SONGS GROUP

## Notes on the Lesson Plans

TP indicates task presentation.

TS indicates teacher stimulus.

SR indicates student response.

TF indicates teacher feedback.

*Italicized passages are teacher talk.*

“Anticipated verbal responses from students are in quotations.”

There are five general components of each song lesson:

- Initial Motivation: to stimulate curiosity and engage students in listening
- Whole-song Presentations: to provide opportunities to hear the song in its entirety
- Continuing Presentations: to provide opportunities to hear and play back song phrases
- Song Performance: the first student performance of the entire song
- Repeated Performances: varied song performance(s) for extra practice

For the sake of time, in order to be certain all songs for the day are taught, it may be necessary to forego repeated performances of a given song. This is particularly true during Week 1, with initial presentations of many songs in a short lesson. Once the students have memorized the nine songs, there will be more time in the lessons for performing variations of the songs.

If students are unsuccessful in playing back a song phrase, feel free to repeat a particular teaching cycle within the lesson plan (TP-TS-SR-TF) until most students are accurate. If students are inaccurate after several attempts, it may be necessary to rethink the presentation or give additional hints, such as scale degree numbers.

## #1 *See The Little Ducklings*

- Initial Motivation: Melodic Contour
  - TP *After I finish the first performance of this song, please be able to tell me if the shape of the melody is like a hill, a valley, or a flat road.*
  - TS Show possible contours with arm motion.
  - TS Perform song.
  
- Whole-song Presentations: Melodic Contour Continued
  - TP *Correct, the shape of the melody is like a hill. This is a children's song called See the Little Ducklings. As I perform the song for you this time, please move your arms to show the shape of the melody.*
  - TS Perform song.
  - SR Show shape of phrase in motion.
  - TF *Thank you for participating. Moving your arms to the shape of the melody is one way for me to know better what you are hearing. And please do not be afraid to be incorrect. That's how I know if I need to go back and reteach something. We don't all have the same ear skills, just as we don't all have the same instrumental skills, but I am 100% confident that all of you will be successful with our activities together.*
  
- Continuing Presentations: Rhythm Focus
  - TP *Now I will play the two phrases of the song and I'd like for you to clap back the rhythm.*
  - TS Perform first phrase.
  - SR Clap rhythm.
  - TS Perform second phrase.
  - SR Clap rhythm.
  - TF *Great job with the rhythm!*
  
  - TP *Here is the entire song. Please clap back the rhythm.*
  - TS Perform song.
  - SR Clap rhythm.
  - TF *Wonderful! You were able to remember the rhythm of the entire song.*
  
- Continuing Presentations: Pitch Focus
  - TP *Does this song move by steps or skips?*
  - SR "It moves by steps."

TF *Correct, the song moves by step.*

TP *Beginning on the first note of the scale, play back the first phrase after I play it for you. Then, beginning on the note where you just ended, play back the second phrase after I play it for you.*

TS Perform phrase one.

SR Play phrase one.

TS Perform phrase two.

SR Play phrase two.

- Song Performance: Entire Song

TP *After I play the song for you, play the melody back in its entirety.*

TS Perform song.

SR Play song.

TF *Wonderful! It sounds like most everyone was able to perform the song accurately. If not, here's another opportunity for you to try playing this song.*

- Repeated Performances: Articulation

TS Play the song again, this time legato.

SR Students play.

TS Play the song again, this time staccato.

SR Students play.

TF *Terrific work on this first song, band! Since learning songs by ear is a new experience for most of you, I wanted to be certain to start with a relatively easy melody. That said, other songs may be a bit more challenging. Keep up the good spirits, like today, and I think you'll find our time together both rewarding and enjoyable. Let's move on to our next tune!*

## #2 *Bells In The Steeple*

- Initial Motivation: Program Description

TP *This song is called Bells in the Steeple and it seeks to remind the listener of the ringing of church bells. To do this, the song uses only the notes of the tonic triad. Let's listen.*

TS Perform song.

- Whole-song Presentations: Steps/Skips/Repeats

TP *As I play the song for you a second time, determine how many phrases there are in the song. I will take a breath before beginning each phrase.*

TS Teacher plays song, breathing before each 4-bar phrase.

SR Students count number of phrases.

TF *That's right, there are two phrases.*

TP *Now I'd like you to determine what kind of melodic motion you hear in each phrase: Do you hear mostly stepping notes, mostly skipping notes, or mostly repeated notes. The two phrases are different.*

TS Teacher plays song, saying "phrase 1" and "phrase 2" at the appropriate times.

SR "The first phrase has repeated notes. The second phrase has skipping notes."

TF *That's correct. The first phrase has some repeated notes while the second phrase has skipping notes.*

- Continuing Presentations: Phrase Shape

TP *Now I will play just the first phrase of the song. With your hands, show me the shape of the first phrase. Remember, it should be clear to me if you are showing repeated notes, stepping notes, or skipping notes.*

TS Teacher shows possible arm motions for repeated notes, stepping notes, and skipping notes.

TS Teacher plays phrase one.

SR Students indicate repeated notes and distance between them with hands.

Note Be certain students hear and show 1-3-5-3, not 1-3-5-1.

TF *Yes!*

TP *Now I will play just the second phrase of the song. With your hands, show me the shape of the second phrase.*

TS Teacher plays phrase two.

SR Students indicate skipping notes from low to high with hands.  
TF *Yes!*

- Continuing Presentations: Use of Tonic Triad

TP *This song uses only the notes of the tonic triad. Play me the first, third, and fifth notes of the scale.*

TS Teacher holds up one, three, or five fingers to indicate which pitches to play.

SR Students respond to teacher cues.

TP *With my hands moving to a low, middle, or high position, I will ask you to play the various notes of the tonic triad.*

TS Teacher moves hands low, middle, and high (in random order).

SR Students respond to teacher hand signals.

TF *Great!*

TP *After I play the first phrase of the song, please play it back on your instrument. Remember to use only notes of the tonic triad.*

TS Perform first phrase.

SR Play first phrase.

TP *After I play the second phrase of the song, please play it back on your instrument. Remember to use only notes of the tonic triad.*

TS Perform second phrase.

SR Play second phrase.

- Song Performance: Entire Song

TP *After I play the song for you, I'd like you to play it back in its entirety.*

TS Perform song.

SR Play song.

TF *That's exactly right!*

- Repeated Performances: Tempo

Play the song in small groups. Maybe have a quick contest to see which group can play the song fastest but still with excellent accuracy and tone.

### #3 *Twinkle, Twinkle Little Star*

- Initial Motivation: A Familiar Melody

TP *Our next song will probably be familiar. Why don't you tell me some of the titles you know for this song?*

TS Perform song.

SR Students suggest titles.

TP *Sure, it's the ABC Song, or Twinkle, Twinkle Little Star. This song has three phrases. We'll call the first phrase A. Please tell me if the middle phrase is the same or different, and if the third and final phrase is the same or different from the A phrase.*

- Whole-song Presentations: Form

TS Perform song, indicating verbally the beginnings of each phrase.

SR Students indicate "A-different-same."

TF *Yes, the middle phrase is different and we will call it B. The final phrase, though, is the same as the opening phrase and so we will call it A.*

TP *So, what is the form of this song?*

SR "ABA form."

TF *That's correct, it is an ABA form. I will play the song again. During the A sections, pat the beat softly on your knees, but during the B section, tap your toes softly on the floor.*

TS Play song on piano.

SR Do motions are requested.

- Continuing Presentations: Phrase-by-phrase

TP *This song begins on the first note of the scale and skips up. Play the first note of Twinkle and then figure out the next pitch by playing some higher notes on your instrument.*

SR Students experiment until they figure out the upper note.

TF *That's correct, the song skips up to the fifth note of the scale.*

TP *On your own, play through the A section of the song. Raise your hand when you think you have it correct.*

SR Students play the first phrase.

TP *Here is the first pitch of the B section. Match this pitch on your instruments.*

- SR Students play the appropriate pitch, the fifth note of the scale.
- TP *Now listen as I play the B section. Play this middle section back as soon as I finish playing it on the piano.*
- TS Perform second phrase.
- SR Play second phrase.
- TF *Great!*
- TP *Now we'll play the entire song, with you echoing each phrase after I play it on the piano.*
- TS Perform first phrase, the A section.
- SR Play it back.
- TS Perform second phrase, the B section.
- SR Play it back.
- TS Perform third phrase, the repeat of the A section.
- SR Play it back.
- Song Performance: Entire Song
- TP *Let's put that all together. Play the entire song.*
- SR Play song.
- Repeated Performances: Alternate Aloud and Silent Phrases
- TP *This time you will play parts of the song on your instrument and think through parts of the song while fingering/sliding along. Let's begin by playing, which I will indicate by pretending to play the clarinet. When I point to my ears, you should think and finger/slide through the song until I give you the signal to begin playing again.*
- TS Teacher cues aloud and silent phrases. Repeat this activity a few times, changing directions first every four measures and later every two measures.
- SR Students perform or think through the song as indicated by the cues of the teacher.
- Note Conclude the lesson with a full-song, out loud performance.



#4 *Frère Jacques*

- Initial Motivation: Place/Language of Origin

TP *This next melody will probably also be familiar to you. In what language do you often hear this song?*

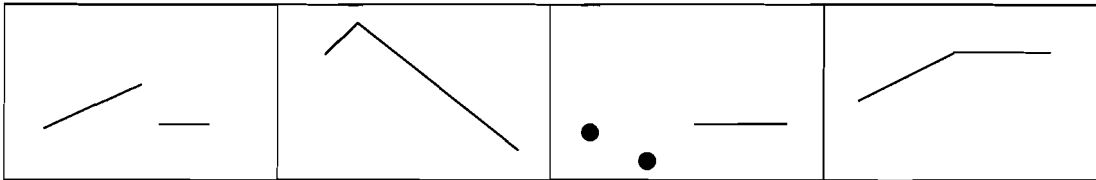
TS Perform song.

SR “It is sung in French.”

TF *Yes, Frère Jacques is a lullaby from France.*

- Whole-song Presentations: Shapes

TP *Now I will play the melody again. You will notice that every mini-phrase is repeated, and there are four phrases in the song. I’ve drawn the shape of the four mini-phrases on the white board, but the boxes are mixed up. As you are listening, think about the shape of each phrase and decide which box is first, second, third, and fourth.*



TS Perform song.

TP *Which box represents “Morning bells are ringing?”*

(Teacher sings the phrase with lyrics.)

SR “The second box.”

TP *Which box represents “Ding, dang, dong?”*

(Teacher sings the phrase with lyrics.)

SR “The third box.”

TF *Exactly!*

TP *Now I will perform the entire melody again, and you will have another opportunity to decide which of the remaining boxes is “Are you sleeping?” and which of the boxes is “Brother John.” What difference do you see, visually, between the two boxes?*

SR “Both drawings indicate that the music goes up, but one starts on the first note of the scale and the other goes up beginning from a higher note of the scale.”

TF *Good attention to details!*

TP *Now I'll play the song.*

TS Perform song.

TP *Which box represents the first phrase, "Are you sleeping?"*  
(Teacher sings the phrase with lyrics.)

SR The second box.

TP *Which box represents the second phrase "Brother John?"*  
(Teacher sings the phrase with lyrics.)

TF *So, the song begins on the tonic, or first note of the scale.*

- Continuing Presentations: Echo-play Each Phrase

TP *Let's learn the song phrase by phrase. The first phrase begins and ends on the first note of the scale. Try playing the first phrase on your own.*

SR Students play first measure on their own, in their own tempo: 1-2-3-1

TS (Teacher helps students as needed either by singing or playing piano.)

TF *Good, you're getting it.*

TP *Let's have a solo demonstration.*

TF After students have had time to try it on their own, select a soloist to demonstrate the phrase. *Good, you've got that down.*

TP *The second phrase begins on the third note of the scale. Try playing that phrase on your own.*

SR Students play third measure on their own, in their own tempo: 3-4-5

TS (Teacher helps students as needed either by singing or playing piano.)

TF *Good, you're getting it.*

TP *Let's have a solo demonstration.*

TF After students have had time to try it on their own, select a soloist to demonstrate the phrase. *Good, there's the second phrase.*

TP *The third phrase begins on the fifth note of the scale. Try playing that phrase on your own.*

SR Students play fifth measure on their own, in their own tempo: 5-6-5-4-3-1

TS (Teacher helps students as needed either by singing or playing piano.)

TF *That is sounding pretty accurate.*

TP *Let's have a solo demonstration.*

TF After students have had time to try it on their own, select a soloist to demonstrate the phrase. *That's the way!*

TP *Let's figure out the fourth and final phrase of the song. On your instruments, match the notes I play for "Ding, dang, dong."*

SR Students match pitches.

TF *That's correct. The lower note is the fifth degree of the scale below the tonic.*

TP *Why don't we play down the scale from the tonic to that low note of the phrase: 1-7-6-5.*

SR Play 1-7-6-5.

TP *And let's hear again, "Ding, dang, dong."*

TS Perform (sing while playing) 1-5-1.

SR Play 1-5-1.

TP *Now please echo-play each phrase, in time, after the piano.*

TS Teacher performs each mini-phrase, followed by student echoes, without pause.

SR Students echo each mini-phrase after each teacher call, without pause.

TF *It's sounding great, band!*

- Song Performance: Entire Song

TP *After I perform the song for you, play it back in its entirety. You may finger/slide along as I perform the song on the piano.*

TS Perform song.

SR Play it back.

- Repeated Performances: Call-and-Response Format; Also as a Round

Play with a soloist or small group of instruments performing the first of each two repeated measures, and the full group answering.

Also, play as a round.

## #5 *Lightly Row*

- Initial Motivation: Head Motif

TP *This is Lightly Row, and it begins with the words “Lightly row, lightly row.” (Teacher sings words while playing head motif on the piano.) Count how many times in the song you hear this motif.*

TS Perform song.

SR “The motif occurs three times.”

TF *Yes, that motif begins each A phrase, and there are three A phrases (or variations thereof) in this song.*

- Whole-song Presentations: Form

TP *Now I’ll perform the song again and I’d like you to raise your hand for the duration of the B phrase. Also, be able to tell me the form of the song.*

TS Perform song.

SR Students raise hands during B section.

TF *Yes, the form is a variation of AABA. (Write AABA on board.) Let’s work on learning the A sections.*

- Continuing Presentations: “A” Phrases

TP *First we need to find the pitches for the words “Lightly row, lightly row.”*

TS Teacher plays 5-3-4-2 on the piano, holding each pitch until the students are successful in matching it.

SR Students respond by matching pitches on their instruments.

TF *Yes, you have it!*

TP *Now I’ll play the first A phrase. Describe how the phrase ends.*

TS Perform first A phrase.

SR “It ends with a scale going up.”

TP *Now, echo-play that opening A phrase.*

TS Perform first A phrase.

SR Play it back.

TP *Now I’ll perform the second A phrase. Describe how the second phrase ends.*

TS Perform second A phrase.

SR “It ends with skips.”

TP *Show me with your hands how that ending skips along.*

TS Perform just the phrase ending: 1-3-5-5-3—.

SR Show with hand motion.

TF *Yes, the phrase ends with skips and they are skips within the tonic triad, 1-3-5.*  
 TP *Play just those two measures for me.*  
 TS Teacher plays 1-3-5-5-3— on piano.  
 SR Play back the phrase ending.  
 TF *Good listening!*

TP *Here is the last A phrase. Is it more like the opening A phrase or the second A phrase?*

TS Perform final A phrase.  
 SR “It is most like the second A phrase, with skips at the end.”  
 TF *Yes, it is more like the second A phrase.*  
 TP *Play just those two measures for me.*  
 TS Teacher plays 1-3-5-5-1 on piano.  
 SR Play back the phrase ending.  
 TF *Yes, just the final note is different from the second A phrase.*

- Continuing Presentations: Phrase by Phrase

TP *Now let’s echo-play the entire song. When we get to the B section, just do the best you can at figuring it out and playing it back.*

TS Perform the song four measures at a time.

SR Play back each four-bar phrase.

TF *Congratulations. Most of you were able to figure out the notes.*

TP *Some of you, however, might benefit from more attention to the B section. Everyone, match the note you hear on the piano.*

TS Teacher plays the second note of the scale, the opening pitch of the B section.

SR Match pitch on instruments.

TP *Now echo-play after me.*

TS Perform 2-2-2-2-3-4.

SR Play 2-2-2-2-3-4.

TP *Match this note that you hear on the piano.*

TS Teacher plays the third note of the scale, which is the pitch that begins the next mini-phrase.

SR Match pitch on instruments.

TP *Now echo-play after me.*

TS Perform 3-3-3-3-4-5.

SR Play 3-3-3-3-4-5.

TP *Here's the entire B section.*  
 TS Perform B section: 2-2-2-2-2-3-4—, 3-3-3-3-3-3-4-5—.  
 SR Play it back.  
 TF *That's definitely an improvement.*

TP *Let's echo-play 4-bar phrases again.*  
 TS Perform song four measures at a time.  
 SR Play back each four-bar phrase.  
 TF *Great. It sounds like you've got it all, now!*

TP *Let's put pairs of phrases together. After me, please.*  
 TS Perform measures 1–8.  
 SR Play it back.  
 TS Perform measures nine through sixteen.  
 SR Play it back.

- Song Performance: Entire Melody

TP *We're ready to play the entire song. Remember the form is AA'BA'.*  
 SR Perform song.

- Repeated Performances: Tutti-Solo-Soli

TP *This time when we play the song, we'll play some phrases all together, some with just a soloist playing, and some with a small group of you playing. (Teacher demonstrates the various cues.) Keep your finger/slides moving throughout the song so that you know exactly where to begin if you are asked to play. When I give you the full-group cue, everyone should be playing. When I give you a solo or small-group cue, only some people should be playing. Good luck!*  
 TS Give cues for tutti vs. solo vs. small-group playing. At first, change every four measures, then every two measures.  
 SR Play the song, following the conductor's cues.  
 TF *Wonderful! It was great how you were all able to keep the song going in your head while others were performing.*

#6 *Skip To My Lou*

- Initial Motivation: Number of Phrases

TP *Next we're going to learn to play the chorus of Skip To My Lou. (Teacher sings a bit of the tune, with lyrics.) With your fingers, discreetly count the number of phrases in the song, adding a finger for each new phrase, like this. (Teacher checks to be certain she can see that all students are beginning with their first fingers pointed, and that the students are actually counting on their fingers so that the teacher can check for understanding.)*

TS Perform song, without breathing or other hints about phrase structure.

TP *Hold up your hands to show me the number of phrases in the song.*

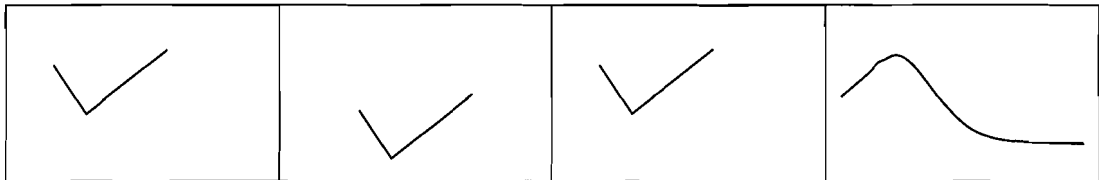
SR Hold up four fingers.

TF *Yes, the song has four phrases.*

- Whole-song Presentations: Same and Different

TP *I've drawn four blank boxes on the white board, one for each phrase. After listening to the song this next time, be able to tell me which phrase is most different from the others.*

At the end of the lesson, the shapes drawn in the boxes will look like this:



TS Perform song.

SR "The last phrase is the most different."

TF *Yes, definitely!*

(Teacher draws squiggle in Box 4 to show its shape and uniqueness.)

TP *I will play the melody again, and when I am finished, I'd like for you to clap back the rhythm of the last phrase.*

TS Perform song.

SR Clap 1+a 2+ 1- 2-.

TF *Perfect!*

- TP *Let's figure out the starting pitch of that the last phrase. Match the note I play on the piano.*
- TS Hold the second note of the scale while the students match on their instruments.
- SR Play the pitch, which is the second note of the scale.
- TF *Exactly! That's the second note of the scale.*
- TP *Now I will play that phrase on the piano, and I'd like for you to play it back.*
- TS Play final phrase.
- SR Play it back.
- TP *Let's practice that one more time. I'll play the entire song now, and you play back only the last phrase.*
- TS Perform song.
- SR Play back final phrase.
- TF *That's it!*
- TP *I have one last question for you. The first three phrases are similar. Do they have the same pitches but different rhythms, or do they have the same rhythms but different pitches? Let's listen one more time.*
- TS Perform song.
- SR "The rhythms are the same but the pitches are different."
- TF *Yes. The pitches of the second phrase are different than the first, although if you listen carefully you will find that the first and third phrases are exactly the same in both pitch and rhythm! But more of that later.*
- Continuing Presentations: Harmony
- TP *Of the first three phrases, two skip around the tonic triad and one skips around another chord. Let's work on the opening phrase, which uses only the 1-3-5 notes of the scale. Please match these pitches of the tonic triad. I will hold each until you match it.*
- TS Hold 3-1-3-5 until students match.
- SR Play 3-1-3-5.
- TP *Now let's add the rhythm to that.*
- TS Perform phrase one.
- SR Play it back.
- TF *Yep! And the third phrase will be exactly the same.*
- TP *Here are the main pitches of the second phrase. Match these pitches with me.*
- TS Hold 2-7-2-4 until students match.
- SR Play 2-7-2-4.
- TP *Now let's add the rhythm to that.*



TS Perform phrase two.  
 SR Play it back.  
 TF *You've got it.*

TP *Now please echo-play each phrase after me.*  
 TS Perform each phrase of the song, with student echoes immediately following.  
 SR Play each phrase of the song after each teacher call.  
 TF *That's it, the entire chorus.*

- Song Performance: Entire Melody

TP *Let's begin at the beginning and play the chorus in its entirety.*  
 TS Sing introductory cue: "5-3-1-ready-play."  
 SR Play song.

- Repeated Performances: Verse One

TP *The verses of Skip To My Lou use the same pitches as the chorus. I will sing for you each phrase, with lyrics, and I'd like you to echo-clap the rhythm.*  
 TS Sing each phrase, followed by student clapping of the rhythm.  
 SR Clap each phrase after the teacher sings it.  
 TF *Perfect! When we get to playing this verse, it may be helpful to think the rhythm of the words as you play the pitches on your instruments.*

TP *Now please echo-play each phrase of the first verse after me.*  
 TS Perform each phrase of the song, with student echoes immediately following.  
 SR Play each phrase of the song after each teacher call.  
 TF *That's it, the entire first verse.*

TP *Now let's play the entire verse, thinking of the words of the verse to help you play the correct rhythms, and we'll follow that immediately with the chorus. Don't worry too much if you forget how the rhythms of the verse and chorus are different. What is most important is to get the chorus!*  
 SR Perform song, first the chorus and then the first verse.  
 TF *Fabulous!*

#7 *Santy Maloney*

- Initial Motivation: Phrase Direction (Last Phrase)

TP *I'll perform our next song for you. It is called Santy Maloney. And no, I have no idea behind the meaning of this title. Maybe one of you would like to research this popular folk song! As you are listening, be thinking of the direction of the melody as it concludes.*

TS Perform song.

SR Listen.

TP *Does the melody end by going up or going down?*

SR "It goes down at the end."

TP *Did you get a sense of whether that last phrase moves by step or by skips?*

SR "It moves by steps."

TF *That's correct.*

TP *Please match this pitch on your instrument.*

TS Hold 5.

SR Play the fifth note of the scale.

TP *Which note of the scale are you playing?*

SR "It is the fifth note of the scale."

TP *Now play that last phrase for me.*

TS Perform 5-4-3-2-1—.

SR Play 5-4-3-2-1—.

TP *Actually, this phrase begins on a pick-up note. Let's find that note.*

TS Hold 3.

SR Play the third note of the scale.

TP *What note is that?*

SR "It's the third note of the scale."

TF *Correct.*

TP Now play the entire last phrase, after me.

TS Perform 3-5-4-3-2-1.

SR Play 3-5-4-3-2-1.

TF *Bravo. Now let's go back to listening to the whole song, and we'll work on some other details of the music.*

- Whole-song Presentations: Phrase Shape

TP *This time as you listen, move your arms to show the shape of the phrases. Listen especially for the repeated pitches and the skips down.*

TS Perform song.

SR Show steps, skips, and repeated notes with motions.

TF *Terrific listening, band!*

TP *This time as you listen, clap your hands to the beat during the parts of the song where there are repeated pitches. When you hear the song skip down, slap your legs. On the final phrase, snap high for that high pitch and then show the stepping down to the last note of the song.*

TS Perform song.

SR Show lowest and highest pitches with motions, as described above.

TF *Good. I think by now you have the song pretty well memorized.*

- Continuing Presentations: Hold-play

TP *Do you remember that low fifth note of the scale that we used for “Ding, dang, dong” in Frère Jacques? Well, we’re going to need that pitch for this song.*

TP *I’m going to hold the starting pitch of each phrase until you get it, and then at my cue, please play each phrase along with me as I play it at the piano. If we do not all end on the correct note, I’ll keep playing it until everyone finds it.*

TS Hold-play each phrase.

SR Play back each phrase.

TP *Let’s do that again, this time a little closer to tempo.*

TS Teacher plays song at piano as students perform it on their instruments.

SR Play the song along with the teacher.

TF *You got it!*

- Song Performance: Entire Melody

TP *After I play the song for you, play it back in its entirety.*

TS Perform song.

SR Play it back.

- Repeated Performances: In a Round

Perform the song in a two-, three-, and/or four-part round.

If there is time, try this with one student on a part.

#8 *Alouette*

- Initial Motivation: Conducting and Fermata

TP *Here's a song that many of you will know. It is another song from France, like Frère Jacques. Any ideas?*

SR "Not yet."

TP *That's okay. Let's have a listen! First, though, let me show you that we will learn the four parts of this song, each represented by a box drawn on the white board. I'll call out "number 1," "number 2," "number 3," and "number 4" as I perform the song on the piano.*

TS Perform song.

TP *Does anyone know the opening words or the title of this song?*

SR "It's Alouette."

TF *Yes, definitely.*

TP *This song is usually played with a fermata in the middle. This time as I perform, would you conduct along in 4/4 time. When I get to the fermata, hold up both arms like a conductor would. Remember, when we conduct in 4/4 time, the beat pattern is "floor, left, right, ceiling." (Demonstrate beat pattern for students, turning so that the teacher's back is to the class and the students can copy.)*

TS Perform song.

SR Conduct along.

TF *Hey, there's some nice conducting going on in this room!*

- Whole-song Presentations: Head Motif

TP *This song begins on the tonic. Would you play the Alouette motif for me? I'll play it first on the piano. Play immediately after me, please.*

TS Perform 1-2-3-3.

SR Play 1-2-3-3.

TF *Yes, that's exactly it.*

TP *Now I will perform the song in its entirety, and I'd like you to play along with me every time the Alouette motif comes up.*

TS Perform song.

SR Play along with teacher, but only during the Alouette motif.

TF *You did great with that.*

- Continuing Presentations: B Section

TP *Now let's work on the middle section. I'll play the B section, and I'd like you to show me the shape of the melody with your arms.*

TS Perform B section.

SR Show melody with arm motions.

TP *We need to figure out the notes for the big skips. Would you try to figure them out on your instrument? Raise your hand when you feel you have it.*

TS Sing the octave leaps as necessary to help students.

SR Students experiment on their own.

TP *Play back what I play on the piano.*

TS Perform 1-2-3-4-5-5-5—, 5-6-5-4-3-2-1—.

SR Play that back.

TS Perform 5-5-5—, 5-5-5—.

SR Play that back.

TS Perform 5-4-3-2.

SR Play that back.

TP *Let's try the entire B section.*

TS Perform B section.

SR Play it back.

TF *Amazing!*

- Continuing Presentations: Play Along with Teacher

TP *I'll play the song on the piano. Please join me on the Alouette motif and the B section.*

TS Perform song.

SR Play along on the learned sections.

TF *Yes, that's it. Now there are just a few more parts of the song to learn.*

- Continuing Presentations: A Section

TP *I think we'll be able to play back the A section, but perhaps first we should be certain of just what that low note is. Please find that low note when I give you the cue.*

TS Sing 1-2-3-3-2-1-2-3-1-5, holding on the low dominant.

SR Find and perform low 5.

TF *Yep, you found it.*

TP *Play after me.*  
 TS Perform measures one and two.  
 SR Play it back.  
 TS Perform measures three and four.  
 SR Play it back.  
 TP *The entire section, now.*  
 TS Perform measures one through four.  
 SR Play it back.

- Song Performance: Entire Melody

TP *I'll play the entire song on the piano, while you finger/slide along. Immediately after, you will play the song aloud.*  
 TS Perform song.  
 SR Finger/slide along during the teacher's performance, and then play the entire melody aloud.  
 TF *Congratulations! That was a great performance.*

- Repeated Performances: Dynamics and Articulation

Teacher conducts soft and loud beat patterns, changing every two measures. Students respond accordingly.

Teacher conducts staccato or legato beat patterns, changing every two measures. Students respond accordingly.

Teacher varies both the dynamics and style of articulation. Students respond accordingly.

#9 *Irish Jig*

- Initial Motivation: Where is Ireland?

TP *This is a popular melody in Ireland. Can anyone tell us where the country of Ireland is located?*

SR "Near England."

TF *Yes. Can anyone find either England or, more specifically, Ireland, on this map?*

SR A student volunteer, with any needed teacher assistance, finds Ireland on the map.

TP *What else do we know about Ireland? In America, there is a holiday celebration of Irish heritage.*

SR "Saint Patrick's Day."

TF *That's correct.*

TP *Well, we're on to the song now. Please listen as I play. The song has two sections, and so it is an AB or binary form. Raise your hand when we get to the beginning of the B section. You'll hear that it starts on the highest pitch of the song.*

TS Perform song.

SR Raise hand at beginning of B section.

TF *Good, you found the B section.*

TP *Can you hear which pitch begins the B section? Here, I'll hold it for you, and you can match my pitch on your instrument.*

TS Hold 8.

SR Play the eighth note of the scale, or the high tonic.

TF *Yes, it is the high tonic or the scale, or scale-degree 8.*

- Whole-song Presentations: Mini-phrases

TP *Each section includes four mini-phrases. Each mini-phrase is just one measure long. When I perform the song next time, I'd like you to snap your fingers at the start of each mini-phrase. I'll demonstrate the first two mini-phrases.*

TS Sing the first two measures of the song, snapping two times as appropriate.

TP *Now I'll play the entire song, and you will show me the mini-phrases by snapping. Here we go.*

TS Perform song.

SR Snap every two measures.

TF *Terrific!*

TP *Let's do a little choreography to show the shape of the melody. As I sing, copy my movements. (Basically, teacher does lap-tap lap-tap lap-tap down-- for the A*

section and down-up slopes for the B section, guiding students to show the shape. Students should think the melody but not sing along.)

TS Sing song.

SR Show melodic shape.

TF *I trust that you are starting to get this melody memorized now.*

- Continuing Presentations: “A” Section

TP *We’ll begin with the A section. Let’s practice only the skipping parts, which are the first few beats of the opening mini-phrases. Find these notes on your instrument.*

TS Hold 1-3-4.

SR Play 1-3-4.

TS Hold 7-2-3.

SR Play 7-2-3.

TS Hold 1-3-5.

SR Play 1-3-5.

TS Hold 4.

SR Play 4.

TS Perform 4-3-2-1-7-1-2-3-1-1.

SR Play 4-3-2-1-7-1-2-3-1-1.

TF *Yes, that’s a great start!*

TP *Now let’s do that in rhythm. Please play back what I play.*

TS Perform 1-3-1-3-1-3-4—.

SR Play 1-3-1-3-1-3-4—.

TS Perform 7-2-7-2-7-2-3—.

SR Play 7-2-7-2-7-2-3—.

TS Perform 1-3-1-3-1-3-5—.

SR Play 1-3-1-3-1-3-5—.

TS Perform 4-3-2-1-7-1-2-3-1-1.

SR Play 4-3-2-1-7-1-2-3-1-1.

TF *Terrific, we’re ready now to add in all those little notes.*

TP *Please play back what I play.*

TS Perform first mini-phrase.

SR Play it back.

TS Perform second mini-phrase.

SR Play it back.

TS Perform third mini-phrase.

SR Play it back.

TS Perform fourth mini-phrase.



SR Play it back.  
 TF *Great job. If you missed any notes, you'll have another try at things as we put the mini-phrases together.*

TP *You know what's coming! Please play back what I play.*

TS Perform measures 1–2.

SR Play it back.

TS Perform measures 3–4.

SR Play it back.

TP *Now for the entire A section. Are you ready?*

TS Perform A section.

SR Play it back.

TF *Good concentration everybody. That was a lot of notes!*

- Continuing Presentations: “B” Section from mini-phrases to full section.

TP *Let's listen again to the B section. Please tell me how many times you hear the descending scale pattern.*

TS Perform B section.

SR “The descending scale occurs three times.”

TF *Yes, three times.*

TP *On the board are three possibilities for the descending scale pattern: AAA, AAB, ABB, ABA, or ABC.*

*Listen to the end of each pattern to determine how it changes.*

TS Perform B section.

TP *Looking at the board, what did you hear? AAA, AAB, ABB, ABA, or ABC?*

SR “It was ABA.”

TF *Correct. The middle pattern was different from the other two.*

TP *Please echo-play the mini-phrases of the B section. Remember that this section begins on the highest note of the scale. Find that note on your instrument.*

TS Hold 8.

SR Play 8.

TF *That's it. Remember to begin each pattern on that note, no matter how the other notes are going!*

TP *Here we go with the mini-phrases of the B section.*

TS Perform measure 5.

SR Play measure 5.

TS Perform measure 6.

SR Play measure 6.

TF *Let's be certain we're all matching those last three notes.*

TS Hold 3-5-2.

SR Play 3-5-2.

TP Now that entire mini-phrase again.

TS Perform 8-7-6-5-4-3-5-2.

SR Play 8-7-6-5-4-3-5-2.

TF *Yes, so going on now.*

TS Perform measure 7.

SR Play measure 7.

TS Perform measure 8.

SR Play measure 8.

TP Let's play two measures at a time.

TS Perform measures 5–6.

SR Play it back.

TS Perform measures 7–8.

SR Play it back.

TP *Now for the entire B section. Are you ready?*

TS Perform B section.

SR Play it back.

TF *Whew!*

- Song Performance: Entire Song

TP *Now we'll play the entire song. Finger/slide along as I play through the song the first time, and then begin your performance immediately after I finish. I love this song, and I hope you do as well. It is lots of fun to play!*

TS Perform song.

SR Play it back.

TF *Wow! You were amazing! I can't wait to hear you play this later in the other keys.*

- Repeated Performances: Call-and-response Performances with Varied Articulations

TP *Let's add in some slurs for this song. Play each mini-phrase after I sing it. I'm really gonna mix this up a bit, so get your ears on!*

TS Sing each mini-phrase, making it clear which notes are slurs and which are not.

SR Play back each mini-phrase.

TF *That's good, careful listening, everyone. Thank you!*

APPENDIX M  
EXERCISES FOR EXERCISES GROUP

## List of Exercises for the Exercises Group

SE refers to *Standard of Excellence, Book 3* (Pearson, 1995)

IR refers to *I Recommend* (Ployhar, 1972)

All page numbers refer to the student book.

Italicized names are titles I used in the student booklets.

1. *Scale-Arpeggio-Thirds*  
SE, p. 38–39, Scale Studies
2. *First Triples Study*  
IR, p. 9, Line 24
3. *Second Triples Study*  
SE, p. 28, Line 104, Technique Break (measures 1–4 only)
4. *First Scale Study*  
IR, p. 7, Line 3
5. *Second Scale Study*  
IR, p. 10, Line 31
6. *Around and About*  
SE, Line 2, Technique Break
7. *Broken Chord Study*  
SE, Line 52, Technique Break
8. *Rhythm Study in 5/4*  
SE, Line 99, Technique Break
9. *Rhythm Study in Changing Meters*  
SE, Line 116, Technique Break
10. *Arpeggios*  
IR, p. 16, Arpeggios
11. *Thirds*  
IR, p. 17–19, Interval Studies
12. *Fourths*  
IR, p. 17–19, Interval Studies
13. *Fifths*  
IR, p. 17–19, Interval Studies
14. *Octaves*  
IR, p. 17–19, Interval Studies

APPENDIX N  
TONIC PATTERNS FOR EXERCISES GROUP

## Instructions for Teaching the Tonic Patterns

Students have the Tonic Pattern Sheet printed in their exercise packet.  
See next page for a copy.

Day 1 of Weeks 1, 2, and 3 of instruction:

In the key of the week, teach Lines 1 and 2 of the Pattern Sheet.  
These are 1-3-5 tonic patterns.

Day 2 of Weeks 1, 2, and 3 of instruction:

In the key of the week, teach Lines 3 and 4 of the Pattern Sheet.  
These patterns add the upper octave tonic and the lower dominant.

## Suggested Script for Teaching the Tonic Patterns

### Exercises Group Day 1

*Play for me the first note of the scale, printed in the first measure of Line 0. SR.*  
*Play for me the first note of the scale, printed in the first measure of Line 0. SR.*  
*Play for me the first note of the scale, printed in the first measure of Line 0. SR.*

*When we find patterns made up of just these three notes of the scale, in any octave, we call this a tonic pattern. We have the lowest pitch of the triad (point to the note on Line 0 and have students play the note their instruments), the middle pitch of the triad (point to the note on Line 0 and have students play the note on their instruments), and the highest pitch of the triad (point to the note on Line 0 and have students play the note on their instruments).*

*Please read and play the tonic patterns you find on Lines 1 and 2. We will pause slightly between patterns, so watch for my conducting cue to tell you when to begin the next pattern. SR.*

### Exercises Group Day 2

*Looking at Line 0, play for me the first, third, and fifth notes of the scale as we learned them last time. Now play the upper octave tonic of the scale, printed in the fourth measure of Line 0. That will be the upper note Bb-concert, whatever that is for your instrument. Line 3 includes new tonic patterns with that note. Let's play those patterns together.*

SR: Perform Line 3 of the Pattern Sheet.

*Now we will add a lower pitch of the tonic triad, printed in the fifth measure of Line 0. If you have any questions about how to play that note on your instrument, please ask me so that I can help you. [Teachers provide assistance as needed.] Line 4 includes new tonic patterns with the lower note. Let's play those patterns together.*

SR: Perform Line 4 of the Pattern Sheet.

*Thinking of all of the notes of the tonic triad that we have learned, let's repeat all of the patterns we learned today.*

SR: Perform Lines 3 and 4 of the Pattern Sheet.

*Terrific! In the arpeggio and interval drills that we'll learn, you will hear passages that consist only of skips within the tonic triad. Of course, other patterns skip within the dominant chord or other triads. These skip patterns contrast with the scale-wise or step patterns used in the scale drills that we'll learn. This is information you might consider when you look over a new piece of music.*

C-Instrument Group  
Scale and Tonic Patterns in Bb-Concert.

This is your Bb-concert scale.



These are the notes of the Tonic Triad.

Line 0



These are your tonic patterns in Bb concert.

Line 1



Line 2



Line 3



Line 4





APPENDIX O  
TEACHING PROCEDURES FOR EXERCISES GROUP

## Practicing the Scales and Technical Exercises

Remind students of the concert key and key signature of the day.

The whole-note scale plus tonal patterns (Days 1 and 2 of Weeks 1–3) or Scale-Arpeggio-Thirds (Day 3 of Weeks 1–3) will take approximately three minutes.

For the remaining 16 minutes or so of the lesson, play through and rehearse the exercises listed. Gauge your time so that there is enough time for each exercise and so that, by the end of the week, all exercises are mastered to approximately the same degree of accuracy.

During repetitions of exercises, any of the following rehearsal strategies are appropriate:

- change the articulation or add dynamics
- vary the instrumentation
- part practice (one or two measures at a time)

For any percussionists having trouble keeping up, try having them play just the first pitch of every measure or rhythmic grouping.

During Week 4, review week, work to speed up the exercises, and try new variations.

Here are some possibilities for varied repetitions:

Exercise 2	slur three; slur two then tongue one, tongue one then slur two
Exercise 3	play all staccato; then all legato
Exercise 4	crescendo while ascending, decrescendo while descending; reverse
Exercise 5	slur two then tongue two; reverse
Exercise 6	slur four
Exercise 7	tongue one then slur three (first half); slur three and tongue one (second half)
Exercises 8–9	play all legato; then all staccato
Exercise 10	crescendo while ascending, decrescendo while descending; reverse
Exercises 11–14	slur every two pitches

APPENDIX P  
LESSON PLANS FOR EXERCISES GROUP

Day 1 (of each new key)

Patterns Lines 1 & 2

2. First Triples Study
3. Second Triples Study
4. First Scale Study
5. Second Scale Study
8. Rhythm Study in 5/4
9. Changing Meters

Day 2 (of each new key)

Patterns Lines 3 & 4

10. Arpeggios
11. Thirds
12. Fourths
13. Fifths
14. Octaves
4. First Scale Study
5. Second Scale Study

Day 3 (of each new key)

1. Scale--Arpeggio--Thirds
6. Around and About
7. Broken Chord Study
8. Rhythm Study in 5/4
9. Changing Meters
2. First Triples Study
3. Second Triples Study

APPENDIX Q  
TESTING ORDERS

Scenario	Order	TASK 1		TASK 2		TASK 3		TASK 4		TASK 5		TASK 6	
1	20	Row	Bb	Row	G	Row	Db	a	Bb	b	G	c	Db
2	21	Row	Bb	Row	Db	Row	G	a	Bb	c	Db	b	G
3	16	Row	Bb	Row	G	Row	Db	b	Bb	a	G	c	Db
4	23	Row	Bb	Row	Db	Row	G	b	Bb	c	Db	a	G
5	22	Row	Bb	Row	G	Row	Db	c	Bb	a	G	b	Db
6	6, 30	Row	Bb	Row	Db	Row	G	c	Bb	b	Db	c	G
7	9, 33	a	Bb	b	G	c	Db	Row	Bb	Row	G	Row	Db
8	24	a	Bb	c	Db	b	G	Row	Bb	Row	Db	Row	G
9	1, 25	b	Bb	a	G	c	Db	Row	Bb	Row	G	Row	Db
10	17	b	Bb	c	Db	a	G	Row	Bb	Row	Db	Row	G
11	2, 26	c	Bb	a	G	b	Db	Row	Bb	Row	G	Row	Db
12	11, 35	c	Bb	b	Db	a	G	Row	Bb	Row	Db	Row	G
13	12, 36	Row	Bb	Row	Db	Row	G	a	Bb	b	Db	c	G
14	18	Row	Bb	Row	G	Row	Db	a	Bb	c	G	b	Db
15	13	Row	Bb	Row	Db	Row	G	b	Bb	a	Db	c	G
16	5, 29	Row	Bb	Row	G	Row	Db	b	Bb	c	G	a	Db
17	7, 31	Row	Bb	Row	Db	Row	G	c	Bb	a	Db	b	G
18	19	Row	Bb	Row	G	Row	Db	c	Bb	b	G	a	Db
19	14	a	Bb	b	Db	c	G	Row	Bb	Row	Db	Row	G
20	3, 27	a	Bb	c	G	b	Db	Row	Bb	Row	G	Row	Db
21	10, 34	b	Bb	a	Db	c	G	Row	Bb	Row	Db	Row	G
22	8, 32	b	Bb	c	G	a	Db	Row	Bb	Row	G	Row	Db
23	4, 28	c	Bb	a	Db	b	G	Row	Bb	Row	Db	Row	G
24	15	c	Bb	b	G	a	Db	Row	Bb	Row	G	Row	Db

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