A preliminary comparative study of rhythm systems employed within the first-year college aural skills class

by

Brett Allen Janssen

B.S., Wichita State University, 2004
M.A., University of Missouri-Kansas City, 2007

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Curriculum and Instruction
College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2017

Abstract

The purpose of this study was to discover whether differences exist in rhythm pattern achievement of the three rhythm systems Takadimi, 1 e & a, and 1 ta te ta in introductory level aural skills classrooms. Participants (N = 27) were first-level aural skills students in three Midwest colleges. Data were collected by implementing a demographics questionnaire to obtain a descriptive profile of the participants, Gordon's (1989) *Advanced Measures of Music Audiation* (*AMMA*) test to obtain the music aptitude level of the participants, and a researcher-designed pretest and posttest.

A significant difference was unable to be determined of rhythm pattern achievement between the three systems. However, results revealed improvement of rhythm reading between the pretest and posttest for all rhythm systems. A significant difference was unable to be determined in achievement between students with low and high aptitude following instruction in a particular rhythm system. The improvements in rhythm reading suggest that progress and achievement can be independent of using any of the three rhythm systems, but further investigation with a larger sample is recommended.

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Chapter 1 - Introduction

In my first year of teaching college, when students participated in dictation activities assigned in the course titled Aural Skills, rhythmic errors occurred predominantly more than pitch errors. It appeared as if students understood the initial melodic placement of notes but recognition of duration was a challenge. I began to wonder if students who understand music theory may not necessarily perceive rhythm in such a way as to successfully demonstrate rhythms in aural skills exercises (Rogers, 2004). Visual recognition of a notation system that represents the understood rhythmic aural experience is a fundamental component of music, often called rhythmic literacy, and is considered a vital arranging component for music (Cooper & Meyer, 1960). Rhythmic literacy, the ability to read and notate rhythm, is one of the deficiencies observed in college music education students (Ester, 2010). Rhythm learning processes are the most difficult aspects of music reading (Bebeau, 1982; Hoffman, Pelto, & White, 1996; Miller, 1988; Potter, 1990; Henry, 2011) and a frequent contributor to mistakes when sight-reading music. Rhythm reading skills were found to be the strongest contributor related to sight-reading scores (Elliot, 1982; Henry, 2011). Students who obtain high sight-reading scores are able to perform a score of music at first sight that would take a student with a low sight-reading score two or three times to perform accurately.

Rhythmic dictation is a component of rhythmic literacy and requires translating an aural duration to notation (Ester, 2010). One observed challenge for students is to organize a sequence of aural durations into a prescribed notation in simple or compound meter, demonstrating a lack of understanding of rhythm patterns and the location of macrobeats and microbeats (Gordon, 2012). One of my top students approached me with frustration saying that she was unable to

notate rhythms, which is congruent with Paney and Buonviri's (2014) findings that students have difficulty notating rhythms when using no rhythm system or an inconsistent rhythm system.

A rhythm system is a pedagogical tool to present rhythm and develop music literacy through chanting (Gordon, 2012). Many rhythm systems have been developed (Varley, 2005, Ester, 2010, Colley, 1987, Palkki, 2010, Hill, 2008), all whose purpose is to assist in teaching reading and transcribing rhythm into notation. Ester (2010) states that "Rhythm…syllables serve as mediators between sound and symbol" (p. 32). Taggart (1989) states "the use of rhythm syllables enables students to remember (retain in audiation) a larger vocabulary of rhythm patterns than would be possible without the use of rhythm syllables" (p. 55). Rhythm systems are important tools to facilitate audiation to understand, recall, and anticipate music, or give meaning to the music (Gordon, 2012). Every rhythm system can be organized on a spectrum of sound-based to symbol-based in which a variety of syllables are available to communicate either the beat placement within the measure or the rhythm attacks within the beat. The goal of each system should be to connect sound to symbol and symbol to sound, including understanding the organization of attacks into metrical structure, and to enhance musical performance (Ester, 2010; Hoffman, Pelto, & White, 1996; Gordon, 2012).

Need for the Study

The *1 e & a* number counting system was developed by Harr and published in his 1937 percussion method book (Varley, 2005). Harr's system presents numbers to represent the macro beats and syllables of *e & a* to represent simple meter subdivisions of the 2nd, 3rd, and 4th sixteenth notes. Therefore, the system is based on beat function within the measure rather than note value. The triplet subdivision is represented by the words *tri po let* and the numbers representing the beats in compound time (6/8) of *1 2 3 4 5 6* or also *1 & a 2 & a* to indicate the

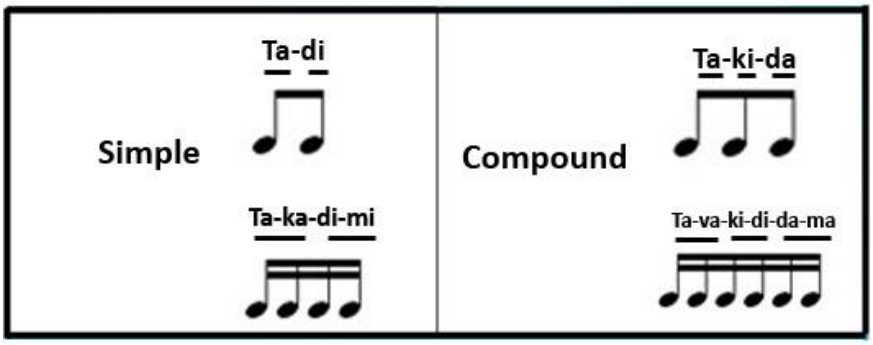
macro beats. The rhythm syllable fails to be generalizable to different meters and compound meter syllables are an extension of simple meter syllables (Walters & Taggart, 1989). From a survey taken at the Missouri Music Educators Association convention, the majority of music teachers were taught in college with Harr's rhythm system (Varley, 2005). Harr's is the most prevalent rhythm system used throughout American public schools and beginning method books (Varley, 2005) (See Figure 1.3).

McHose and Tibbs developed what is known as the Eastman system in 1944 (Varley, 2005), in which numbers represent the macro beat location within the simple measure signature and syllables of *ta te ta* to represent the subdivision of sixteenth notes. The triplet is represented by the beat number location within the measure followed by *lah lee*. Compound meter is represented by the number within the measure on the macro beat with the subdivision sixteenth notes represented by *ta la ta li ta*. The complex rhythms include syllables to represent second-level subdivisions such as 32nd notes, represented as *1-ta-ta-ta te-ta-ta-ta*, but the understanding of meter must occur before the syllables can be applied, limiting the application (Hoffman, et al., 1996). The rhythm syllable is generalizable to different meters. McHose and Tibbs rhythm system ranks third in a survey asking teachers what system was taught in college, behind Harr and Kodály systems (Varley, 2005) (See Figure 1.3).

The Takadimi rhythm system was developed from tabla playing of North India by Hoffman, Pelto, & White (1996) as a tool to communicate rhythm and metrical understanding to all ages of music students. The Takadimi rhythm system includes syllables that represent every portion of the beat with each portion of the beat having its unique syllable, within simple and compound meter while addressing more complex meters. The syllables *ta-ka-di-mi* represent the subdivisions of the beat in simple meter where the attack of the beat is always represented by *ta*,

and the attack of the division of the beat is always represented by *di*, followed by the *ka* and *mi* representing the subdivisions, respectively. Within compound meter, (*ta-va-ki-di-da-ma*) the attack of the beat is always represented by ta and the attack of the division of the beat (into three) is represented by *ta-ki-da*, but the division of the beat (into two) is represented by *di* to indicate the middle of the beat, as in simple meter. Takadimi also accounts for irregular divisions of the beat, with a unique syllable representing the attack within the particular portion of the beat. Vocal facility is assisted by the placement of vowels that follow attack consonants within simple and compound meter, where the same vowel is represented in each portion of the division of the beat, such as *ta-ka* on the first division and *di-mi* on the second division of the beat. The same occurs in compound meter, where *ta-va* occurs on the first division, *ki-di* on the second division, and *da-ma* on the third division of the beat. Because of the unique syllable representing the position within the beat, an understanding of syncopation within the exact location of the attacks is possible (See Figure 1.1).

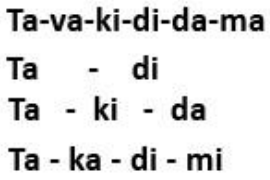
Figure 1.1 Vowel Placement in Takadimi



The unique syllables also enable rhythmic dictation of a phrase in either simple or compound meter. The syllables "may be used for identifying and reproducing patterns aurally and orally, then ascribing notation to sound, rather than a more traditional approach that begins with the complexities of notation" (Hoffman, et al., 1996, p.19). This system can also be applied

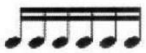
to complex situations, such as teaching rhythms of three against two and four against three (See Figure 1.2).

Figure 1.2 Takadimi Polyrhythms



Kodály presented a rhythm system which Varley (2005) found to be used the most in the music classroom, directly behind Harr's *1 e & a* number counting system. The syllable for one quarter note is represented by *ta*, two eighth notes represented by *ti ti*, and subdivision sixteenth notes of simple meter represented by *ti ri ti ri* or *ti ka ti ka*. The triplet is represented by *syn co pa*. Compound meter sixteenth notes are represented by *ti ka ti ka ti ka*. The solfege fails to be generalizable to different meters and the *syn co pa* for the triplet is a mnemonic association not consistent with the rest of the system. Another argument against this system is that it fails to address complex rhythms found in the college classroom (Hoffman, Pelto, & White, 1996). The syllables of this system are assigned to note types regardless of the meter, or context. Therefore, the function of the beat is not communicated to the student and rhythm within compound and changing meters is challenging to read (Palkki, 2010; Bowyer, 2015; Colley, 1987). The Kodály system was not selected for this study because it is "inappropriate for modeling rhythmic understanding" in the college-level aural skills class (Karpinski, 2000, p. 80-81) (See Figure 1.3).

Figure 1.3 Rhythm System Syllables

Simple Meter	Harr	McHose & Tibbs	Takadimi	Kodaly	Gordon
	1	1	ta	ta	du
	1 &	1 te	ta di	ti ti	du de
	Tri po let	1 la le	ta ki da	syn co pa	du da di
	1 e & a	1 ta te ta	ta ka di mi	ti ri ti ri or ti ka ti ka	du ta de ta
		1 ta ta ta te ta ta ta			du ah le ah de ah le ah
Compound Meter					
	1	1	ta	ta	du
	1 2 3 or 1 & a	1 la le	ta ki da	syn co pa	du da di
	1 2 3 4 5 6 or 1 & a 2 & a	1 ta la ta li ta	ta va ki di da ma	ti ka ti ka ti ka	du ta da ta di ta

The challenge when teaching rhythmic patterns is 1) selecting which rhythm system will more consistently contribute to student organization and transfer into rhythmic literacy and 2) determining deficiencies in the primary and secondary sequence that must be addressed in college. No research has occurred in a college-level aural skills classroom to determine if rhythm systems of Takadimi, 1 e & a, or 1 ta te ta, lead to a difference in rhythm achievement. Fust's (2006) qualitative study compared Takadimi with the 1 e & a system but failed to indicate a difference in achievement between the two systems. Limitations of Fust's study include the study length being five weeks, the intermediate-level musicians had already begun rhythm reading with the 1 e & a system, and the number of participants were four sixth grade woodwind players from one school district.

Bacon (1998), Pearsall (2009), and Colley (1987) found differences in the effectiveness of rhythm systems within the elementary music classroom but the studies fail to address the differences in the effectiveness of rhythm systems at the collegiate level. Bacon found in the beginning band classroom, students who were taught rhythm using Gordon's rhythm system and

a neutral syllable performed compound meter patterns better than students who were taught using the 1 e & a system. Pearsall concluded that when measuring tempo consistency, Kodály and Gordon rhythm systems are more effective than the 1 e & a system. Colley found three factors that contributed to rhythm system effectiveness which include (1) how easily syllables could be recalled, (2) whether or not the syllables provide a reference point for the macrobeat, and (3) the extent of differentiation of simple and compound metrical patterns.

Purpose Statement

The purpose of this study is to discover if differences exist in rhythm pattern achievement of three rhythm systems (Takadimi, 1 e & a, and 1 ta te ta) in the first level college aural skills classroom. Rhythm systems are defined in this study as pedagogical tools to help students learn rhythm patterns aurally and notational.

Research Questions

1. Is there a difference in achievement among rhythmic skills based on the instruction and usage of a specific rhythm system?

2. Is there a difference in student achievement between students with low and high aptitude as measured by (*AMMA*) following instruction in a particular rhythm system?

Definition of Terms

Macrobeat – Fundamental beats in a rhythm pattern. In 2/4 meter, quarter notes are performed or are underlying macrobeats. In 6/8, dotted quarter notes are performed or are underlying macrobeats (Gordon, 2012, p. 400).

Meter – The organization of the pulse by two (duple), three (triple), or four (quadruple) recurring patterns. Also the subdivision of the pulse by two (simple) or three (compound) recurring patterns (London, 2001, p. 531).

Microbeat – Divisions of a macrobeat. In usual duple meter in 2/4, groups of two eighth notes are performed or are underlying microbeats. In 6/8, groups of three eighth notes are performed or are underlying microbeats (Gordon, 2012, p. 401).

Music Achievement – Accomplishment in music (Gordon, 2012, p. 403).

Music Aptitude - Potential to achieve in music as measured by Primary Measures of Music Audiation (PMMA), Intermediate Measures of Music Audiation (IMMA), Musical Aptitude Profile (MAP), or Advanced Measures of Music Audiation (AMMA)(Gordon, 2012, p. 53, 404).

Rhythm Literacy - The ability to translate rhythm notation into vocal sound (reading) and sound into notation (notating) (Ester, 2010, p. 1).

Rhythm Syllables - Names chanted for different durations in a rhythm pattern (Gordon, 2012, p. 408).

Rhythm Systems - Mediators between sound and symbol. Rhythm systems perform the key cognitive function of verbal association and help encode and store aural patterns. Each rhythm system has a reason in a specific context. The purpose for each rhythm system is to develop rhythm literacy using rhythm syllables (Ester, 2010, p. 32 & 42).

Takadimi - A rhythm system developed in 1996 for the purpose as a pedagogical tool to present rhythm and develop rhythm literacy. The *ta* represents the macrobeat in simple and compound meter, with the other syllables representing microbeats (Hoffman et al., 1996, p. 13-14).

Limitations

All students have different degrees of learning potential of music (Gordon, 2012). The current study attempted to recognize the differences so to recognize the influence on student

achievement scores. The music aptitude was measured by Gordon's *Advanced Measures of Music Audiation* (*AMMA*) test to determine the music aptitude of each student prior to the study (Gordon, 2012).

The rhythm system each student had experienced prior to collegiate study may create a bias to one rhythm system over another. For example, if a student in the Takadimi aural skills class experienced Harr's 1 e & a system while learning music in elementary and secondary schools, the student may not be interested in learning a new rhythm system. If the student was experienced with the Takadimi system, they may excel at rhythm literacy more so than students without Takadimi experience. The researcher designed a questionnaire which each subject completed the same time as the pretest. The questionnaire addressed this external influence in an attempt to normalize the population, but there may still be a bias due to previous experience with rhythm systems.

Students who used one rhythm system in high school and used the same rhythm system in the aural skills classroom will be more familiar with learning and reading rhythms in college than the students who are asked to implement another system. However, students who are asked to adapt to a non-familiar rhythm system in the aural skills class, may struggle with rhythm learning due to the effort of learning a new rhythm system. For example, if 1 e & a was implemented in high school but the aural skills class implements Takadimi, the student must go through the process of adapting to Takadimi while learning rhythm.

Differentiation in teaching style between the aural skills instructors may influence student achievement. A defined instructional protocol attempted to unify commonality to reduce the limitation. Instructional styles, teacher centered to student centered, were observed, analyzed, and compared to the rhythm achievement in the classroom (Reese, 1993).

The culture of each class is different. The instructor may teach the same course in his or her tenure, but every cohort of students has different attributes due to different personalities and attitudes that contribute to the culture (Cocking, 2004; Draves, 2008; Hong, Chang, and Chai, 2014). Three different classes were a part of this study which have different cultures, which may affect the outcome of student achievement.

Students may not remember the transition from one rhythm system to another. For example, students may have learned rhythm with the Kodaly or Orff system in the elementary classroom and transition to the 1e&a system when beginning band or orchestra. A transition in rhythm systems beyond this may be more memorable, such as entering college and being presented with a new rhythm system.

The number of subjects within the study is small and unequal between groups. This inhibits the use of many statistical analyses. Results and implications may not be generalizable to the greater population; therefore any conclusions drawn from data must be examined cautiously.

Delimitations

Subjects consisted of students in three small central Kansas colleges to maintain a consistent similar class size and educational environment. Only students involved in the first level aural skills course were subjects and each aural skills class instructor implemented a different rhythm system. Each instructor taught the rhythm lesson using the rhythm system that was most comfortable to the instructor. The same lesson plans were implemented describing how and when each rhythm pattern is presented and how to instruct students to practice each rhythm pattern. The researcher was one of the three aural skills instructors.

Chapter 2 - Literature Review

The purpose was to identify differences in rhythm pattern achievement of three rhythmic systems Takadimi, 1 e & a, and 1 ta te ta in the first level college aural skills classroom. The three rhythm systems were selected because of their utilization in the first level college aural skills classroom. This chapter is divided into five sections: *History of Rhythm Systems* provides historical background of rhythm syllable systems. *Theories of Music Learning Related to Rhythm Literacy* provides scholarship and studies concerning rhythmic literacy. *Psychological Aspects Related to Rhythm Literacy* provides psychological qualities related to memory, rhythm perception, and rhythm cognition. *Sight Reading as a Component of Rhythm Literacy* explores the relationship of sight reading on rhythmic achievement. *Methodology* presents methodological support to the current study.

History of Rhythm Systems

Counting Oriented Rhythm Systems

Rhythm systems oriented around counting, also referred to as number systems, are rhythm systems that implement numbers with subdivisions of the beat. Numbers are assigned to notes of the location within a measure where the attack of the beat occurs. The pedagogical value is in communication of the placement within a measure. Gordon (2000) stated that counting systems are a "little more than a time keeping device and designed for use with only the most simple rhythm patterns found in usual duple meter" (p. 94). The positive characteristic of every number system is the communication of the beat function within the measure in that it "relates to music as it is kinesthetically experienced" (Walters & Taggart, p. 62). However, one negative aspect, characteristic of every number system, is the requirement of the learner to understand rhythm notation before hearing the rhythm, which violates what Hoffman, Pelto, &

White (1996) and Walters & Taggert (1989) state regarding rhythm learning of sound before sight. Another negative aspect is that the number systems require the learner to count, which requires intelligence not closely related to music aptitude. The number system "will lower potentially high achievement in students who have low intelligence but high music aptitude" (Walters & Taggart, 1989, p. 62).

Harr's 1 e & a system.

The 1 e & a system was developed by Harr and published in his 1937 percussion method book. Harr's system presents numbers to represent the macro beats and syllables of *e & a* to represent simple meter subdivisions of the 2nd, 3rd, and 4th sixteenth notes. Therefore, the system is based on beat function within the measure rather than note value. The triplet subdivision is represented by the word *tri po let* and the numbers representing the beats in compound time (6/8) of *1 2 3 4 5 6* or also *1 & a 2 & a* to indicate the macro beats. The rhythm syllable system failed to be generalizable to different meter and compound meter syllables are an extension of simple meter syllables (Walters & Taggart, 1989).

The text above informed this study to implement Gordon's Advanced Measures of Music Audiation (AMMA) test to determine the rhythmic aptitude of the subjects as well as the selection of the Harr's rhythm system.

McHose and Tibbs 1 ta te ta system.

McHose and Tibbs developed what is known as the Eastman system in 1944, where numbers represent the macro beat location within the simple measure signature and syllables of *ta te ta* to represent the subdivision of sixteenth notes. The triplet is represented by the beat number location within the measure followed by *lah lee*. The function of the macrobeat is communicated within compound meter with the macrobeat represented by the number and the

subdivision sixteenth notes represented by *ta la ta li ta*. The complex rhythms include syllables to represent second-level subdivisions, such as 32nd notes, such as *1-ta-ta-ta te-ta-ta-ta*, but the understanding of meter must occur before the syllables can be applied, limiting the application (Hoffman et al., 1996). The rhythm syllable system is generalizable to different meters. The McHose and Tibbs rhythm system is important to this study by guiding the selection of the rhythm syllable system methodology.

Beat Oriented Rhythm Systems

Beat oriented syllabic rhythm systems emphasize a pattern of a beat where counting oriented syllable systems emphasize counting within a measure. Beat oriented syllable systems implement syllables to the beat and subdivisions of the beat. The pedagogical value is to communicate the placement of attacks within the beat, and in some cases, the function within the measure. The syllabic systems that are based on beat function rather than note value, "relating to music as it is kinesthetically experienced" include Simplified French Times-Names, Takadimi, systems by Luther Mason, Galin and Curwen, Gordon, and Froseth and Blaser (Walters & Taggart, 1989, p. 62).The syllabic systems that fail to communicate the beat function, therefore requiring the sight before sound (one must know the note values before chanting the syllable), include the Kodály, Richards, and Sueta systems (Hoffman et al., 1996). The studies and texts above guided this study in the selection of rhythm systems.

Hoffman, Pelto, & White's Takadimi system.

The Takadimi syllabic rhythm system, developed by Hoffman, Pelto, & White in 1996, offers syllables that represent every portion of the beat with each portion of the beat having its unique syllable, within simple and compound meter while addressing more complex meters. The syllables *ta-ka-di-mi* represent the subdivisions of the beat in simple meter, the attack of the

macrobeat is always represented by *ta*, the attack of the division of the beat is always represented by *di*, followed by the *ka* and *mi* representing the subdivisions, respectively. Within compound meter, (*ta-va-ki-di-da-ma*) the attack of the beat is always represented by *ta*, and the attack of the division of the beat (into three) is represented by *ta-ki-da*, but the division of the beat (into two) is represented by *di* to indicate the middle of the beat, as in simple meter. Takadimi also accounts for irregular divisions of the beat, with a unique syllable representing the attack within the particular portion of the beat. Vocal facility is assisted by the placement of vowels that follow attack consonants within simple and compound meter, where the same vowel is represented in each portion of the division of the beat, such as *ta-ka* on the first division and *di-mi* on the second division of the beat. The same occurs in compound meter, where *ta-va* occurs on the first division, *ki-di* on the second division, and *da-ma* on the third division of the beat. Because of the same syllable representing the position within the beat, an understanding of syncopation within the exact location of the attacks is possible. The unique syllables also enable rhythmic dictation of a phrase in either simple or compound meter. The syllables "may be used for identifying and reproducing patterns aurally and orally, then ascribing notation to sound, rather than a more traditional approach that begins with the complexities of notation" (Hoffman et al., 1996, p.19). This system can also be applied to complex situations, such as teaching complex rhythms of three against two and four against three.

The Du-ta-de-ta system, commonly known as Gordon's 1980 syllable system though created by Froseth and Blaser, is similar to Takadimi in that the division of the beat in simple and compound meter maintain vowel sounds distinct to the location of the microbeat. For example, the *du* always represents the attack of the macrobeat. In simple meter the division of the beat is represented by *de*, similar to *di* in Takadimi. In compound meter the division of the

beat is represented by *du da di* comparable to *ta ki da*. However, the difference between the systems occurs with Gordon's subdivisions, which are always represented with a *ta* regardless of the division vowel (Palkki, 2010). The studies above guided this study in the selection of the Takadimi rhythm syllable system.

Theories of Music Learning Related to Rhythm Literacy

Theories of music learning provide depth and guidance to pedagogical choices that can guide students in an aural skills classroom towards rhythm literacy. The following theories provide a foundation for assisting students in achieving rhythm literacy.

Gagné's (1985) learning theory consists of a combination of behavioral and cognitive learning. Behavioral learning occurs at the lower order of thinking, or knowledge acquisition, to establish a foundation of rhythm vocabulary; the instructor strategically chooses when and how to introduce the vocabulary. Chaining occurs throughout this process, which is defined as many "simple stimulus-response connections linked together in sequence, thereby creating more complex and higher-order associations" (Ester, 2010 p. 12). Once a foundation of rhythm vocabulary has been established, higher order thinking, also known as information processing, can occur through application of the knowledge acquisition. As described by Ester (2010), an example of chaining occurs when a music teacher taps a rhythmic pattern of two eighth notes and one quarter note, have students imitate the pattern, then give a verbal association with the pattern to assist with classification and encoding. The students can then retrieve the newly acquired pattern to synthesize with learned patterns to create a meaningful rhythmic sentence. This process of acquiring new information, or knowledge, then encoding information into long-term memory so it is retrievable, and then comparing and discriminating new information and generalizing concepts to match concepts is unique to Gagné's theory (Ester, 2010). Gagné's

learning theory is important to this study by informing the protocol to teachers for rhythm instruction.

Pestalozzi's music learning theory consists of sound-before-symbol, where sounds are introduced to create a musical inventory before they are connected with a symbol. Once the connection is created, musical literacy can be established further through reading and notating. Joseph H. Neef, who taught under Pestalozzi, presented Pestalozzi's ideas including:

1. To teach sounds before signs and to make the child learn to sing before he learns the written notes or their names;
2. To lead him to observe by hearing and imitating sounds, their resemblances and differences, their agreeable and disagreeable effect, instead of explaining these things to him – in a word, to make active instead of passive in learning;
3. To teach but one thing at a time – rhythm, melody, and expression, which are to be taught and practiced separately, before the child is called to the difficult task of attending to all at once.
4. To make him practice each step of these divisions, until he is master of it, before passing to the next;
5. To give the principles and theory after the practice, and as induction from it;
6. To analyze and practice the elements of articulate sound in order to apply them to music, and
7. To have the names of the notes correspond to those used in instrumental music.

(Ables, Hoffer, & Klotman, 1994, p. 11)

As described by Palkki (2010), students who are not experienced with sound before symbol look at a written musical score and are unable to conceptualize a full aural understanding of the score; they are unable to audiate. Furthermore, sound before symbol suggests that concepts must be taught and experienced in the context of musical situations rather than only describing the musical concept. Pestalozzi's learning theory is important to this study by informing the protocol to teachers for rhythm instruction.

Gordon's (2012) music learning theory is rooted in audiation, which contributes to music aptitude and music achievement. Audiation consists of translating sound into music, and "assimilating and comprehending" music that has been heard in the past and music heard now.

Audiation is also "assimilating and comprehending" music that we are reading, improvising, or composing and it is part of the learning process, which is to hear, perceive, then audiate music (p. 3). Audiation occurs when we listen, recall, perform, interpret, create, improvise, read, or write music; it is a method of communication. Imitation, memory, and recognition are part of the audiation process, and the stages include:

1. Listening to familiar or unfamiliar music
2. Reading familiar or unfamiliar music
3. Writing familiar or unfamiliar music from dictation
4. Recalling and performing familiar music from memory
5. Recalling and writing familiar music from memory
6. Creating or improvising unfamiliar music while performing or in silence
7. Reading and creating or improvising unfamiliar music
8. Writing and creating or improvising unfamiliar music (Gordon, 2012, p. 13)

Developing the ability to audiate was reflected in the lesson plans of the study. Students echoed the instructor on a neutral syllable then echoed the instructor on the rhythm syllables (Listening to familiar or unfamiliar music). Students translated from a neutral syllable to the rhythm syllables (Recalling and performing familiar music from memory). The instructor connected the sound to symbol (Reading familiar or unfamiliar music). The instructor chanted the rhythm pattern using rhythm syllables and students notated the pattern (Writing familiar or unfamiliar music from dictation). The instructor and students then read rhythm phrases using rhythm syllables (Reading and creating unfamiliar music) (See Appendix C).

The Music Learning Theory states that all students are capable of learning music but learning is determined by environment and musical aptitude. Learning consists of sound before sight and sequential teaching/learning. Rhythm and tonal systems are techniques used to teach tonal and rhythmic patterns, which is a foundation of the Music Learning Theory. These systems must be used to convey and learn the different sequence activities. Through this process, the student continues to develop a vocabulary of pitch and rhythmic patterns through the use of pitch

and rhythm syllable, which can be used to code and decode music (Gordon, 2012). Gordon's Music Learning Theory is important to this study by informing the protocol to teachers for rhythm instruction.

Sound Connections is curriculum for developing music literacy that Ester (2010) has developed from research and it is aligned closely with Gordon's Music Learning Theory (Gordon, 2012). The purpose of *Sound Connections* and Gordon's Music Learning Theory is for one to see what is heard and hear what is seen. Included in the curriculum is a definition of music literacy, a history of music literacy instruction, music learning theories which include research on memory and music perception, and rhythm systems. Ester explains how the research contributes to the design of the curriculum in developing music literacy. The curriculum includes sequencing instruction and introducing rhythm patterns by (1) neutral echoing, (2) syllable echoing, (3) echo-translation, (4) connect sound to symbol, (5) application and practice, (6) notating, and (7) melodic reading. Ester defines music literacy as "the ability to translate notation into vocal sound (reading) and sound into notation (notating)" (p. 1). Other learning theories that support *Sound Connections* are of Pestalozzi (sound before sight) and Gagné (Ester, 2010). Ester's *Sound Connections* is important to this study by informing the protocol to teachers for rhythm instruction.

Ester, Scheib, and Inks (2006) discuss *sound before symbol* and explain that this has been the basis for the approach to teaching rhythm. This approach has roots in the educational learning theories of James Mursell, Jerome Bruner, and Robert Gagné. The *sound before symbol* originated in the music learning theory of Johann Heinrich Pestalozzi and is implemented in the music learning theory of Edwin E. Gordon. Ester, Scheib, and Inks' study influences this study by informing the teaching sequence of the rhythm patterns.

Psychological Aspects Related to Rhythm Literacy

Understanding perception of rhythm, how rhythm is heard and organized, and information storage provide depth to the instructional protocol in the aural skills classroom to enhance rhythm achievement.

Theory of memory and perception of time

Ormrod (2004) presented the basic components of memory. A dual-store model of memory was developed by William James in 1890, but Richard Atkinson and Richard Shiffrin adapted James' model in 1968 and 1971, which included sensory register, short term memory, and long term memory. The dual-store theory is unique in that short-term and long-term memory are viewed as separate units. Sensory register, also referred to as sensory memory, is a brief storage also known as iconic memory and echoic memory[1]. Understanding of auditory information within the sensory register component occurs within sequential context, such as the phrase "I scream for Ice cream" (Ormrod, 2004, p. 171). Information lasts from two to four seconds in the sensory register then may move to working memory[2] based on what captures attention, which holds a limited capacity. Working memory is where cognitive processes take place such as chunking, maintenance rehearsal, and phonological looping (Decker, 2011; Jeneson & Squire, 2013; Takeuchi et al., 2012). Information may last from five to twenty seconds in the working memory component, then may move to long-term memory if deemed

[1] Sensory register is the first component of the dual-store model which holds incoming information long enough to undergo preliminary cognitive processing (Ormrod, 2004, p. 169).

[2] Also known as short-term memory and the second component in the dual-store model (Ormrod, 2004, p. 176).

important, which includes episodic[3], semantic[4], procedural[5], and conceptual knowledge[6]. Ormrod's text informs this study by guiding instructional protocol.

Dowling and Hardwood (1986) addressed memory as schema determining how much we pay attention to remember information. "Our attention is guided by knowledge structures developed in our experience of the world" (p. 124). In the context of music, a schema may be how we perceive the meter of a particular piece or the tonal scale of a particular piece due to our musical experience. More specific schema may be the relationships between tones in a melody or the pattern of temporal durations of a beat. Schemata guide the listener to anticipate what occurs next in the music, which assists with memory. Dowling and Hardwood's research informs this study by guiding instructional protocol.

Tighe and Dowling (1993) offer explanations and definitions of rhythmic characteristics regarding western music. There are two psychological structural levels, the first of which includes the level of metric regularity, or where the constant beat is noticed, and the second level includes rhythm patterns that occur over the constant beat. Therefore, the meter provides a cognitive framework that allows more complex rhythms to be heard.

Gestalt psychology representations include (1) when rhythm is experienced, it is done so as a pattern, or a whole, in that the sound events are grouped together and not experienced as single, unrelated events and (2) if a rhythm is clapped, it can be repeated by clapping, or grouping rhythms together, which was demonstrated in a study around 1900 (Tighe & Dowling,

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[3] Memory of personal life experiences (Ormrod, 2004, p. 233).

[4] General knowledge of the world independent of those experiences (Ormrod, 2004, p. 233).

[5] Knowledge that involves knowing how to do tasks (Ormrod, 2004, p. 234).

[6] Knowledge that reflects our understanding of why certain events happened and why certain things are the way they are (Ormrod, 2004, p. 234).

1993). Tighe & Dowling's text guided this study by providing a framework for the rhythm lessons, pretest, and posttest. Rhythmic patterns within the macrobeat are introduced individually with neutral syllable, rhythm syllable echoing, and transcribing rhythm patterns. The patterns are then applied contextually by sight-reading rhythm sentences and melodic phrases in simple meter and compound meter.

Sight Reading as a Component of Rhythm Literacy

Rhythm literacy consists of the ability to translate the sequence of durational sounds to sight (notation) and sight to durational sounds (Ester, 2010). Sight-reading, translating sight to sound, is a component to rhythm achievement in the aural skills classroom (Karpinski, 2000).

Killian and Henry (2005) examined 198 high school singers, individually singing two melodies from notation with and without a thirty-second practice opportunity. The design was a post-test experimental design and included a demographic survey inquiring of musical experience. Overall pitch and rhythm accuracy scores were significantly higher when the subjects had preparation time but less accurate singers did not benefit from practice time. The videoed test showed that higher scorers kinesthetically kept the beat and kept a steady tempo. Characteristics of the high achieving sight-singers included taking private voice or piano lessons, playing an instrument, and playing in an instrumental ensemble. Further research was suggested by Killian and Henry of rhythmic awareness and tempo stability in high and low achieving sight-singers. Killian and Henry's study guided this study in the pretest and posttest design by allowing thirty seconds for students to observe the melodic example before performing. Rhythmic patterns are embedded in melodic phrases, which directed the selection of melodic phrases for the current study. Videoing the students as the pretest and posttest were performed and including a demographical survey inquiring of musical background guided the current study.

Hayward and Gromko (2009) examined predictors of music sight-reading ability. Predictors of speed and accuracy include aural pattern discrimination, spatial-temporal reasoning, and technical proficiency. There were 70 participants of wind players in college concert bands who were tested using Gordon's *AMMA* and the Watkins-Farnum Performance Scale, Form A. A regression analysis was implemented and results support previous research that suggest that auditory, visual, spatial, and kinesthetic activations occur together when wind players sight-read music notation. The researchers determined though aural-spatial skills and technical proficiency skills were separate, they both are essential to the task of sight-reading. Hayward and Gromko's study guided this study by including a pretest that student's sight-read, and implementing a regression analysis to determine predictors of sight-reading ability.

The purpose of Earney's (2008) study was to determine the effects of aural rhythmic dictation on the sight-reading abilities of seventh and eighth grade band students. There were 128 participants in a pretest post-test experimental design. Results showed there was no significant difference found between students who completed aural rhythmic dictation exercises and those who played the rhythms. Both groups demonstrated significant differences from pre to post-test. The instrument used was Sight-Reading Test I and II. Earney suggested further research on factors influencing sight-reading scores include melodic dictation at the middle school level, considering rhythmic and melodic errors, using a word association, and audiation activities with students. Testing instruments that are more objective may be considered, such as *Smartmusic* computer software. Furthermore, a video camera may be used to view how subjects prepared for sight-reading music. Earney's study guided this study in the pretest posttest experimental design, providing one point possible per macrobeat on the pretest and posttest, and providing musical examples for subjects to sight-read on the pretest and posttest.

Elliot (1982) examined thirty-two undergraduate instrumentalists who were also music theory students at the University of South Carolina. The purpose was to investigate the relationships of sight-reading ability with technical proficiency, rhythm reading ability, sight singing ability, cumulative grade point average, cumulative music theory grade point average, cumulative performance jury grade point average, and major instrument grade point average. The rhythm reading test was an adaptation of the Watkins-Farnum Performance Scale and scoring the test consisted of marking the measures in which an error occurred and totaling the measures performed correctly. The performances were audio recorded. Results of the multiple correlation indicated a positive relationship ($r = 0.90$) of rhythm-reading ability and sight-reading ability. A general linear model was implemented and indicated that rhythm-reading ability was found to be the best predictor of instrumentalists' sight-reading scores. The researcher suggested that reading rhythm patterns in the instrumental ensemble is a good teaching strategy to use when teaching sight-reading. Elliot's study guided the current study by the selection of subjects of undergraduate aural skills students, adapting current sight-singing exercises for the pretest and posttest, video-recording the pretest and posttest performances, and implementing multiple correlation and regression analysis to determine significant predictors on the posttest scores.

Henry's (2011) purpose was to determine effects between pitch and rhythm skills, or patterns, that occur when sight-reading with subjects of 252 high school choral students. The subjects completed a survey to acquire demographical information including grade level, choral experience, and private voice, piano, and instrument study. The student was given thirty seconds to study the score, after which the student sight-sang the melody. Each pitch pattern and rhythm pattern were awarded one point if performed correctly. Logistic regression analysis was

implemented and success at rhythmic tasks was found to be a predictor of success at pitch tasks. An ANOVA was implemented and determined significant differences between groups and a post hoc analysis determined significant differences between no piano and instrumental experience and those with piano and instrumental experience. Significance was found also between those with piano experience and no instrumental experience. Rhythm success was found to be a predictor of pitch success, and vocalists with piano or instrumental experience were more likely to perform a rhythmic task with a pitch task than vocalists with no piano or instrumental experience. Henry suggested that for vocalists more emphasis should be on rhythm reading and using rhythm reading systems during sight-reading regularly. Henry's study guided the current study by implementing a demographical survey asking for musical experience, giving the subjects thirty seconds to view the score before performing on the pretest and posttest, awarding one point for each rhythmic beat pattern correctly performed on the pretest and posttest, and executing regression analysis and an ANOVA.

Boyle's (1970) purpose was to determine if an approach to reading music that used a kinesthetic component to mark the beat and using clapping to practice rhythm patterns would improve instrumentalists' sight-reading in notated melodies. Data was collected from 191 junior high band students with a pretest and posttest. The treatment occurred over fourteen weeks, where ten minutes of class time, three days a week was devoted to the treatment. Rhythm aptitude was measured by Gordon's Musical Aptitude Profile. A high correlation was found between rhythm sight-reading and music sight-reading. Boyle's study guided this study by implementing a pretest and posttest of sight-reading music to measure for rhythm achievement, with treatment of rhythm lessons.

Methodology

The following studies provide a foundation for the methodology chosen for this study. Researchers have suggested many ways that rhythmic understanding is communicated. Studies with elementary students have suggested that clapping (Colley, 1987), imitation (Wolf, 2004), transcribing in notation (Ping-Cheng Wang, 2008; Colley, 1987), verbal chanting (Pearsall, 2009; Upitis, 1986; Schleuter, and Schleuter, 1989), and recognizing the rhythmic pattern performed by the researcher by selecting the notation between two choices (Colley, 1987) communicate rhythmic understanding. Studies with middle school (6th grade-8th grade) and high school students suggest that sight-reading (Earney, 2008), notation (Earney, 2008), imitation (Bacon, 1998), and performance (Bacon, 1998) communicate rhythmic understanding. Methodology is divided into three subsections: 1) Rhythm System Methodologies; 2) Rhythm System Methodologies, Design and Instrumentation; 3) Design, Instrumentation and Pedagogy.

Rhythm System Methodologies

Hill (2008) presented how Orff and Kodály approaches are more effective than the counting system within piano method books. The researcher surveyed piano method authors about counting systems and teaching rhythm in the method books. Hill suggests future research to compare the level of rhythmic ability between students using the numeric counting system and beat oriented counting system. In regards to using syllables or words to teach rhythm, James Harding states "children can hold words in their minds far more easily than abstract rhythm patterns" (Harding, 2002). Anderson (2000, p. 6-8) agreed that children understand syllabic counting better since with numeric counting children have a tendency to become confused between finger numbers and counting numbers." Hill's study guided this study in the selection

of three rhythm syllable system methodologies including counting systems and a beat oriented system.

Palkki (2010) explored sound before symbol approach to rhythm pedagogy, the history of rhythm syllable systems, and the importance of an effective rhythm syllable system. The influence of the Kodály system on Takadimi was examined and Palkki divides rhythm systems into three categories including systems where words are used as the rhythm syllables, number-based rhythm systems, and rhythm systems using original syllables. Rhythm syllables were categorized into a beat based system where a metric hierarchy was present. Emphasis was on how notes function within the measure and a symbol system where a syllable is assigned to the note type regardless of meter. Palkki's study guided this study in the selection of three rhythm syllable system methodologies including counting systems and beat oriented systems.

The purpose of Pearsall's (2009) study was to investigate the relationship between tempo consistency and the rhythm syllable systems used during a standardized rhythm performance task. Research questions include 1) to determine if the tempo consistency of students' recorded rhythm performances, when measured objectively and in isolation, differed with regard to the rhythm syllable system used, 2) to determine the relationship between an objective, isolated measure of students' tempo consistency and a subjective, overall rating of students' rhythm achievement. The study used a random sample from a population of 3,500 fourth-grade students in South Carolina who completed the *Rhythm Improvisation Task* from the SCAAP Entry-level Music Assessment that was administered in 2007. Out of the 79 schools, 48 used the Kodály rhythm system, 26 used the 1 e & a rhythm system, and 5 schools used the Gordon rhythm system. The sample size was about 35 students per rhythm system. The SCAAP rhythm task required students to perform using rhythm syllables, to a microphone and testing booklet, along

with a prompt cd (with the rhythm system of the respected group) was provided to the music teachers. The rhythm patterns were eight beats long and included only macrobeats and microbeats.

The average time for each student to complete the rhythm performance task was four minutes. The Computerized Speech Lab (Model 4150B) was used to measure tempo consistency, which is used in clinical speech and voice pathology fields (Pearsall, p. 38). The researcher developed the Tempo Consistency Measurement Procedure to objectively measure the tempo consistency of the subjects' rhythm performances. The Macrobeat Jitter Ratio was adapted for the study because it is generally used for the diagnosis and treatment of voice disorders, but in this study it is used to determine the macrobeat. The rhythm judgement was subjective, but the SCAAP Rhythm Criterion Rubric was implemented. The researcher found that the Kodály and Gordon systems were more effective than the 1 e & a system for being able to perform with a steady tempo and may help develop rhythm audiation. The researcher discussed the 1 e & a, Kodály, and Gordon counting systems and rhythm syllable system efficacy studies but failed to mention the Takadimi rhythm system. Pearsalls's study influenced this study in the selection of three rhythm syllable system methodologies including counting systems and a beat oriented system.

Paney and Buonviri (2014) investigated twelve high school teachers who teach Advanced Placement (AP) Music Theory. The interview questions inquired about teaching melodic dictation. The themes that emerged from this qualitative study include cognitive frameworks, processing strategies, rhythm, and course design. It was found that students have difficulty notating rhythm, and teachers do not have a strong preference of a specific rhythmic counting system. Recommendations for further research by Paney and Bounviri include to survey AP

Music Theory instructors of melodic dictation teaching strategies, the efficiency of particular rhythm systems to develop skills appropriate for melodic dictation, and comparing melodic dictation strategies of students to the success acquired of melodic dictation scores on the AP exam. Paney and Buonviri's study guided this study in the selection of three rhythm syllable system methodologies including counting systems and a beat oriented system.

Rhythm System Methodologies, Design and Instrumentation

The purpose of Bacon's (1998) thesis study was to explore rhythmic syllables used in a pedagogical setting. The research question encompassed whether the use of Gordon's syllables, 1 e & a syllables, or no syllables results in significant differences in achievement in meter recognition and performance of duple and triple meter prepared and unprepared etudes. Bacon used a sample of 81 band students within three groups, offering twelve weeks of instruction with five to ten minutes a day for a rhythm lesson. Rhythm activities included the introduction of rhythmic patterns on a neutral syllable, have subjects echo, followed by the researcher introducing the rhythm syllable system with the rhythms and asking subjects to echo. Notation was introduced and students performed the rhythm using the rhythm syllable system. During the rhythm activities, students were encouraged to tap the macrobeat with their legs while tapping the microbeat with their hands and speaking the rhythm patterns. The treatment period spanned a twelve-week period of 5 to 10 minutes a day of a rhythm lesson using the syllable system of the particular group. The students then performed a meter recognition test and a performance test of etudes with two independent judges scoring. Subjects that were taught using Gordon's or no syllables scored significantly higher than those using 1 e & a only in triple meter.

Questions included 1) is there a significant difference in duple meter rhythmic sight-reading performance between the 1 e & a system, Gordon syllables, and no syllables; 2) is there

a significant difference in triple meter rhythmic sight reading performance between the 1 e & a system, Gordon syllables, and no syllables; 3)is there a significant difference in duple meter rhythmic prepared reading performance between the 1 e & a, Gordon syllables, and no syllables; 4) is there a significant difference in triple meter rhythmic prepared reading performance between the 1 e & a, Gordon syllables, and no syllables; 5) to determine which syllables, the 1 e & a, Gordon syllables, or no syllable system, is a better instructional tool to teach duple and triple meter. The rhythm imagery subsection of Gordon's Musical Aptitude Profile was implemented and rhythms and a rating system were constructed by the researcher. Bacon suggested future studies should include a teacher who is not the researcher.

Varley (2005) surveyed band students in grades 7-12 regarding learning rhythms and their learning styles. Music teachers were also surveyed regarding their background in teaching rhythms and their preferences. The researcher grouped rhythm systems into five categories consisting of ratio, number/counting, syllable, mnemonic, and kinesthetic. The Harr system was used the most, with Kodály and mnemonic devices also used. There was a relationship between how students were taught and which rhythmic syllables were used, but no relationship to the learning styles. The researcher found that most music teachers were unaware if rhythmic counting systems that were more effective. The researcher mentioned that "Boyle's studies in the area of rhythm found that kinesthetic activities increased the accuracy of students' performance of rhythms. More specifically, students who tapped their feet were more likely to perform rhythms accurately than students who do not tap their feet" (Varley, 2005, p. 52). Varley's study guided this study in the selection of three popular rhythm syllable system methodologies and a demographical survey. Varley's study informed protocol of the current study by requiring kinesthetic activity of the instructor and students to tap the beat when

introducing rhythm patterns and chanting the melodic reading exercises to increase the accuracy in performance of rhythms.

Colley's (1987) experimental research included 160 second and third grade children using three syllabic rhythm systems (Kodály, Gordon, and a mnemonic system similar to Orff's) to teach twelve rhythmic patterns containing half, quarter, eighth, and sixteenth notes, combined into complete measures of 4/4 and 6/8. There were 11 weeks of the subjects' weekly music classes, with lessons being 35 minutes each where five minutes were for review or introduction of new material. The remaining time consisted of practicing recognition, dictation, and performance skills. Included were rote echo exercises, each of a complete measure, which simultaneously included kinesthetic movements including clapping, stamping, and finger snapping. Subjects tested on ability to recognize, write, and clap the patterns while the researcher performed the rhythm on a bongo drum with the macrobeat at 60 beats per minute, giving subjects 30 seconds between each item. The experimenter designed the test, and implemented a pretest-posttest experimental design. Results showed that a system which differentiated from duple and triple meter subdivisions improved recognition skills. A system that assigned words to rhythmic patterns improved performance and notation skills. ANOVAs and ANCOVAs were implemented, along with the Newman-Keuls procedure with a mean gains (pretest-posttest). Colley's suggestions of future research were that before any syllabic method can be fully adopted as a viable teaching tool, issues such as meter, anacrusis, syncopation, tied notes, and rests need to be addressed. Other suggestions by Colley for future research included

1. Will an alternative recitation system used in conjunction with mathematical explanations be more effective than using the recitation system by itself?

2. If rhythm reading is to be postponed until children have mastered fractional equivalencies, will children who begin to read rhythms with words or syllables be any further behind or ahead of those who do not?

3. What level of difficulty can we expect children of various ages to reach before it becomes necessary to explain time signatures and the proportional relationships between notes and rests in terms of fractions?

4. If a syllabic system is used, how and when will rests be taught? Will rests each have an assigned syllable or sound (such as the Kodály practice of saying Sh for a quarter rest), or will they be presented as silences equal to the duration of a particular intact pattern?

5. Can a word method such as the one used in this study be developed into a taxonomy of rhythm patterns for teaching purposes? If so, how might regional dialects affect the pronunciation of certain words and phrases? What are the implications of using the word method in foreign countries? Will the order in which the patterns are presented vary according to the meter of the native tongue of the students? (Colley, 1987, p. 234)

Colley (1987) guided this study in the selection of three rhythm syllable system methodologies to measure rhythm achievement. This study was also guided by Colley's in the test design of selecting twelve rhythmic patterns consisting of eighth and sixteenth notes in 4/4 (simple) and 6/8 (compound) meter, using a steady tempo of a macrobeat of 60 beats per minute, and allowing 30 seconds for students to look at the rhythm in the melodic sentence before clapping and chanting. Protocol for teaching instruction of reviewing rhythms presented in earlier lessons briefly within the rhythm lesson and the design of a pretest posttest experimental design were influenced by Colley's study.

Fust (2006) spent 5 lessons with four students; two were taught Takadimi while the others were taught Harr's 1 e & a system. There were no differences in achievement between the rhythm systems. The purpose was "to explore how students effectively learn and perform rhythmic notation". Limitations include that the study was qualitative, a small number of students were a part of the study, and a small number of lessons with each of them. Fust's study guided this study in the selection of the rhythm syllable systems of Takadimi and Harr's

counting system for measuring rhythm achievement. Fust's study guided this study in selecting treatments of eight lessons rather than five lessons.

Design, Instrumentation and Pedagogy

The purpose of Wolf's (2004) research was to improve understanding of the musical abilities of kindergarten children and to establish a hierarchy of rhythm patterns. The researcher designed the *Rhythm Pattern Performance Test*, comprised of thirty recorded frequently used rhythm patterns, to examine the ability to perform patterns by first listening, then imitating the patterns onto an audio recording. The recording the students listened to was a soprano chanting attacks of *bah*, a neutral syllable in duple and triple meters over macrobeat metronome taps at 67, recommended by *PMMA* (Gordon). Practice examples were implemented on the recording before the test began. Two independent judges evaluated the recordings using a six-point continuous rating scale, with six points awarded if the pattern was chanted accurately with all rhythms performed on the macrobeat. Subjects included 165 kindergartners. Wolf's recommendations for teaching rhythm are in accordance with Ester's (2010) Sound Connections of chanting rhythms to students in an echo-response format with improvisation, presented in a sequential manner. Wolf's study guided this study by informing protocol of rhythm instruction, and Wolf's study guided the pilot test of this study requiring the student to perform the rhythms of the melodic phrase with the metronome set to the macrobeat equaling sixty-seven on the pretest and posttest. Wolf's study guided this study by the observation of the pretest and posttest by video recording, after which two judges evaluated the recordings.

Schleuter and Schleuter (1989) measured clapping, chanting, and stepping with a rhythm response test. Results indicate that higher amounts of accuracy occurred as the grade level increased, and chanting was the easiest method of learning to accurately respond and convey

rhythmic patterns. The researchers implemented Gordon's *Primary Measures of Music Audiation*. Schleuter and Schleuter's study influenced this study by informing protocol for teaching instruction by recommending kinesthetic activities to increase the accuracy in performance of rhythms and by measuring rhythm learning with chanting in the pretest and posttest.

The purpose of Ping-Cheng Wang's (2008) study was to investigate how children can be motivated through the Dalcroze approach in developing rhythm. The study included 1000 elementary students from Taiwan, in an experimental pretest-post-test control group design. Activities included tapping, swinging, clapping, turning, and stamping simple rhythms to convey rhythm understanding. Rhythm dictation and improvisation skills were included in the activities and tested. Results include salient differences in progress of learning musical rhythms and were obtained by observation, comparison, and analysis. Ping-Cheng Wang's study influenced this study by guiding teacher instruction of using kinesthetic activities to learn rhythm and by guiding the data collection process of observation.

Brittin (2001) surveyed 131 7th-9th graders in a middle school honor band regarding counting systems used in their elementary and secondary music classes. The subjects completed a set of 3 rhythmic tasks with paper and pencil which included filling incomplete measures, circling incorrect measures, and selecting metric/rhythmic notation representing well-known folk song melodies. Rhythms included half, quarter, eighth, and 16th notes, with dotted patterns and rests in 4/4, 2/4, ¾, and 6/8 meters. The number-based counting system was the favorite at elementary and secondary levels, with the Kodály method used in 10-20% of the programs, and other counting systems reported by a few students. The counting systems had no significant effect on rhythmic scores but students remembering mnemonic counting systems in elementary

classroom music scored significantly better than those remembering use of number-based systems. Private lessons had a significant, positive effect. Overall, there is an effect associated with particular counting systems in elementary general music, but it is unclear whether this is due to the pedagogy or the syllables. Those remembering *ta-ti ti* scored better than those remembering the counting system. Brittin's study influenced this study with the suggestion to include a survey inquiring of the musical background of the subjects as a part of the pretest.

Bebeau (1982) conducted two experiments to compare efficacy of teaching rhythm reading with two approaches, the first a traditional approach (using mathematics to figure out the pulse and where the beat is in the measure - sight before sound), the second a simplified speech cue method (combination of the Orff and Kodály methods). A rhythm reading test of 23 items was given to 107 third graders before and after rhythm instruction, implementing a pretest/posttest experimental design. Results indicated the speech cue made greater gains. Bebeau's study guided this study the selection of rhythm syllable system methodologies to measure rhythm achievement. Bebeau's study guided this study by including a pretest and posttest experimental design.

Gordon's (1989) *AMMA* is a music aptitude test designed for students who are at an advanced stabilized aptitude age (college students). The test does not include subtests of tonal and rhythm, but rather tonal and rhythm are combined into one test. Reliability coefficients can be found in Table 4.1. The test maintains subjective validity and objective validity. Gordon claims that in order to have subjective validity, the researcher should understand the relationship of the *AMMA* to audiation, music aptitude, and musicianship. Through studies, objective validity, including congruent validity, has been established using criterion measures to correlate

test scores (p. 47-48). Two of the seven purposes of *AMMA* as summarized by Gordon (1989) that relate to the current study include:

1. To identify college and university students, non-music as well as music majors, who possess the necessary music aptitude to achieve high standards in music. It is improbable that a student who demonstrates technical proficiency on a music instrument but who does not possess high music aptitude will become a good musician.

2. To establish objective and realistic expectations for the music achievement of college and university music and non-music majors. A music aptitude test is more valid for this purpose than are standardized academic aptitude or achievement tests (p. 7).

Both purposes apply to the current study in that students enrolled in a music aural skills course completed the *AMMA*. This study implemented the *AMMA* to determine if a relationship exists between students with a high, medium, and low music aptitude score on music achievement of reading a musical phrase using a rhythm solfege system.

Wang's (2007) study implemented the *AMMA* with U.S. and Taiwanese college students to measure the extent of musical aptitude in relation to subject's verbal and behavioral preferences for musical styles. Wang discussed the reliability and validity of the *AMMA* (p. 81-83) and implemented a pilot study prior to the main study. Analysis included correlation coefficients of musical aptitude and preferences for the six musical styles, and a MANOVA on subject's musical aptitudes with preferences for the six musical styles. Implementation of the *AMMA* influenced the current study.

Harrison (1996) implemented a multiple regression analysis to determine how musical aptitude, music experience, and sex contribute to predicting grades in a college level music theory course. The only statistically significant predictor was the years of performing experience, but bivariate correlations between musical aptitude and music experience were strong. Harrison implemented Gordon's *AMMA* to determine musical aptitude and found that

musical aptitude was not a significant predictor of music theory grades. Harrison's study guided this study by executing the *AMMA*.

Summary of Literature Review

The literature review includes studies that incorporate rhythm syllables, rhythm literacy, psychological aspects related to memory, rhythm perception and cognition, and sight-reading on rhythmic achievement. Music aptitude tests, including Gordon's *AMMA*, are frequently used to provide a valid and reliable music aptitude score of college students, which guided the current study to select the *AMMA* as an instrument to measure music aptitude (Hayward and Gromko, 2009; Wang, 2007; Harrison, 1996; Gordon, 1989). Methodologies of pretest- posttest research designs are frequently implemented to collect and analyze data before and after treatment (Bebeau, 1982; Schleuter and Schleuter, 1989; Wolf', 2004; Colley, 1987; Earney, 2008) Demographic surveys are implemented to collect information about the subjects (Brittin, 2001; Varley, 2005). There is a deficiency of studies of rhythm pattern recognition and performance using rhythm systems in the college aural skills classroom and quantitative studies using Takadimi rhythm syllables.

The research represented in the literature provided a theoretical and methodical foundation for the design of current study, which addressed questions regarding use of different rhythm systems to teach rhythm literacy in the first level college aural skills classroom. Data were collected from the aural skills classroom.

Chapter 3 - Methodology

This study examines whether a difference in rhythm pattern performance achievement exists between the employment of various rhythm systems. Every rhythm system can be organized on a spectrum of sound-based to symbol-based in which a variety of syllables are available to communicate durations. Counting oriented rhythm systems convey the placement of the beat within the measure where beat oriented rhythm systems convey the attacks within the beat. The challenge when teaching rhythmic patterns is selecting which rhythm system will more effectively contribute to student organization and transfer into rhythmic literacy. The goal of each system should be to connect sound to symbol and symbol to sound, including understanding the organization of attacks into metrical structure, and to enhance musical performance (Ester, 2010; Hoffman, Pelto, & White, 1996; Gordon, 2012).

Purpose

The purpose of this study was to discover if differences exist in rhythm pattern achievement of three rhythm systems Takadimi, 1 e & a, and 1 ta te ta in the first level college aural skills classroom. The study implemented a pretest posttest quasi-experimental design. The following research questions were developed:

1. Is there a difference in achievement among rhythm skills based on the instruction and usage of a specific rhythm system?

2. Is there a difference in student achievement between students with low and high aptitude as measured by (AMMA) following instruction in a particular rhythm system?

Subjects

Subjects (N=27) were part of the participant pool based on being enrolled in the introductory aural skills class at three Midwest colleges. Students of the introductory aural skills

classes volunteered to be a part of the study by signing a consent form (See Appendix A). The students were predominantly Caucasian and freshmen (both 81.4%) and 18 years of age (74%). Female participants (63%) outnumbered male participants (37%) by almost a 2 to 1 ratio. Students who reported an experience performing on both an instrument and voice represented the highest category of musical experience (37%).

Description of Test Sites

The Midwest colleges were selected based on the proximity to each other, institutional size, and the rhythm system implemented in the aural skills class. Each instructor taught the rhythmic component of the aural skills curriculum using a consistent rhythm system of their choice.

Midwest College 1 (MWC-1) is a four-year faith-based (Mennonite) private liberal arts college in Kansas with 457 full time students. Music degrees offered include Bachelor of Arts with Music and Bachelor of Arts with Music Education. A cumulative grade of 75 percent or higher was required to pass the introductory aural skills course. The 1 ta te ta rhythm system was implemented at MWC-1.

Midwest College 2 (MWC-2) is a four-year faith-based (Lutheran) private liberal arts college in Kansas with 610 full time students. Music degrees offered include Bachelor of Music, Bachelor of Music Education, and Bachelor of Arts with Music. A cumulative grade of 70 percent or higher was required to proceed to the next level of aural skills. The 1 e & a rhythm system was implemented at MWC-2.

Midwest College 3 (MWC-3) is a four-year faith-based (Free Methodist) private liberal arts college in Kansas with 518 full time students. Music degrees offered include Bachelor of Science with Music, Bachelor of Science with Music Education, and Bachelor of Science with

Contemporary Christian Music. Students completed weekly teacher designed quizzes using *Auralia* Aural Skills Software on computers located in the fine arts building. A cumulative grade of 60 percent or higher was required to pass the introductory level aural skills course. The Takadimi rhythm system was implemented at MWC-3. Demographics of the colleges, including music degrees and number of full time students, were acquired from Cappex.com.

The three colleges had four, eleven, and twelve students in the introductory aural skills class, respectively. Criteria for selecting the institutions includes demographic similarity and the rhythm system which each instructor used to teach rhythm patterns in the aural skills classroom. The researcher did not require an instructor to change the rhythm system with which the instructor was comfortable using in the classroom. Delimitations of the current study dictated that distance from the researcher and specific requirements regarding rhythm systems required a sample of convenience; therefore, the three participating colleges met all criteria and were subsequently selected.

Aural skills courses met once a week at the MWC-1 and MWC-3, but met twice a week at MWC-2. The instructor at MWC-2 agreed to teach the rhythm lessons once a week. The aural skills course at each college were co-requisites to the introductory music theory courses. All content for the current study was selected from *Music for Sight Singing, 8th edition* by Ottman and Rogers (2010). While this material was not the selected textbook for all participants, it allowed instructors to work with the same exercises in class and assign as rhythm reading homework as stated in the lesson plans.

Design

A pretest posttest quasi-experimental design was designed by the researcher (Campbell & Stanley, 1963). The pretest determined the level of rhythmic competency of students before

treatment, and the posttest allowed for the researcher to determine the extent of improvement in rhythm pattern recognition following treatment. The pretest, treatment, and posttest included common rhythm patterns selected by the researcher from Gordon's (1974) basic simple (2/4) and compound (6/8) rhythm patterns. The pretest and the posttest were similar in length and each common rhythm pattern was represented two times in each test. The patterns were selected due to the appropriateness for the college level aural skills classroom, as found in *Music for Sight Singing, 8th edition* by Ottman and Rogers (2010), and the selected patterns were confirmed to be appropriate for the collegiate music classroom by an expert in the field[7]. The simple meter patterns are found in units one (beat and division of the beat), ten (subdivision of the beat), and fifteen (syncopation within the beat), while compound meter patterns are found in units four (beat and division of the beat) and ten (subdivision of the beat). Student achievement, represented by scores on the pretest and posttest, were the dependent variables. The independent variable was the instructional methodologies, which include the different rhythm syllable systems.

Descriptions of Testing Instruments

The data collection procedure included four parts: A demographics questionnaire, *Gordon's Advanced Measures of Music Audiation* (*AMMA*)(Gordon, 1989), a pretest, and a posttest. The demographics questionnaire was modeled after Varley's (2005) questionnaire but modified specifically for the current study. The pretest and posttest were researcher generated.

The demographics questionnaire collected information including the subject's ethnicity, age, sex, classification in college, and musical instruments played and years of experience of

[7] Studies that implement patterns appropriate to the K-12 music classroom include Bacon, 1998; Colley, 1987; Earney, 2008; Pearsall, 2009; Ping-Cheng Wang, 2008; Schleuter, 1989; Upitis, 1986; Wolf, 2004.

each instrument played, rhythm systems taught to the subject and rhythm systems currently used to guide rhythm learning (See Appendix B). The questions regarding ethnic origin, classification of year in college, rhythm systems taught to the subject, and rhythm systems the subject implements were multiple choice with an option to write in an answer if not provided. The subject was required to write in answers to the questions regarding age, sex, and musical instruments played along with the years of experience of each instrument played.

The pretest and posttest contained published material from *Music for Sight Singing, 8th edition* by Ottman and Rogers (2010). The pretest consisted of melodic exercises 12.3 (simple meter) and 13.62 (compound meter). The posttest consisted of melodic exercises 11.2 (simple meter) and 15.130 (compound meter). The researcher changed some rhythm patterns in the exercises to maintain content validity so all the common rhythm patterns to be taught in the introductory aural skills course were repeated two times in the pretest and posttest exercises. The rhythm patterns were confirmed by an expert in the field to determine face and content validity of the instrument. The pretest and posttest exercises were different but equal and maintained the same rhythm patterns as confirmed by an expert in the field, therefore strengthening the internal validity of the tests.

Musical aptitude was assessed using Gordon's (1989) *Advanced Measures of Music Audiation* test (*AMMA*). The test included 30 questions, each including a pair of short musical phrases that were presented on a compact disc. The student was to answer whether the pair of short musical phrases were same, tonal, or rhythm. Each correct answer contributed to a higher score of either rhythm or tonal aptitude which were combined to an overall aptitude score. The test took 20 minutes to administer and was designed for undergraduate and graduate college students (p. 7).

Observations of instruction were compared using a checklist on the *Observation Guide for Rhythm Lessons* document, created by the researcher (See Appendix D). The checklist required the observer to note (1) the rhythm lesson start and end times, (2) rhythm patterns were introduced as recommended by the researcher, (3) rhythm reading occurred with the class, and (4) rhythm reading was assigned as homework. Similarities and differences of instruction were compared by watching the video recordings to identify if each instructor uses similar methods and the same amount of time presenting and practicing the rhythm patterns as suggested by the researcher.

Reliability of Instruments

Gordon (1989) determined the reliability of the *AMMA* for college music majors and non-music majors by implementing a split-halves procedure with the Spearman-Brown Correction Formula. For music majors, including undergraduate and graduate, reliability coefficients ranged from r = .84 to .88 for split-halves (corrected) and r = .86 to .89 for test-retest (see Table 3.1).

Table 3.1 Reported Reliabilities for the AMMA for Undergraduate and Graduate Subjects (Gordon, 1989)

	Tonal	Rhythm	Total
Music Majors			
Split-Halves	.84	.85	.88
Retest	.86	.87	.89
Non-Music Majors			
Split-Halves	.80	.80	.81
Retest	.80	.80	.83

The researcher video recorded the pretest and posttest. Points were then awarded by the researcher and a colleague by using a checklist to determine whether one point should be awarded to a correctly chanted macrobeat. The checklist guidelines included (1) *If rhythm system is incorrect but rhythm is correct, award the point*, (2) *If the student stops, then begins again, award the point(s) if at least two consecutive beat patterns are correctly chanted*, (3) *If the student chants using the correct rhythm system but the macrobeats are not chanted on the metronome beat, no point is awarded*, (4) *If the student chants using the correct rhythm system and the macrobeats are chanted on the metronome beat but the rhythmic beat pattern attacks are not exactly in the correct place, award the point(s)*. This created interrater reliability, with a Pearsons's *r* correlation coefficient of .87 for the pretest and .88 for the posttest. Any discrepancies were discussed and determined whether a point should be awarded by both the researcher and colleague, based on the checklist. The researcher video recorded two of the eight rhythm lessons to assure the rhythms were introduced in uniform across each site. The recorded lessons were validated with the researcher-created *Observation Guide for Rhythm Lessons* (See Appendix D).

Procedures

A pilot study, which included the pretest and posttest, was implemented to obtain clarity of questions and procedures, which were adjusted. After receiving approval from aural skills instructors and the Institutional Review Board, the participants completed Gordon's *AMMA*, the demographics questionnaire, and the pretest. The participants then received treatment in their respective classes over an eight-week period, after which the posttest occurred.

Pilot Test

The pretest and post-test were piloted with music colleagues and advanced music students. The researcher collected opinions from music colleagues of the clarity of the pretest and post-test instructions, the clarity of survey questions and answers, the equality between the pretest and post-test, whether there was any bias to a particular rhythm system, and whether the pretest and post-test is testing what was intended. Opinions were collected from advanced music students regarding clarity of the pretest and post-test instructions, and regarding the clarity of survey questions and answers. The advanced music students also completed the pretest and post-test.

Adjustments were made to the study following the pilot study with recommendations from music colleagues and advanced music students. The survey was condensed from two pages to one page without eliminating any questions to avoid confusion and to avoid the possibility of a subject skipping the second page. The macrobeat pulse was lowered from 67 beats per minute (bpm) to 60 bpm, which is congruent with what Ester (2010) recommended when chanting rhythm patterns. Lesson plans for the instructors to use when covering rhythm patterns and rhythm chanting in class were changed to include *Each task may be repeated until 80% of the class accomplishes the task* (See Appendix C). From recommendations, the instructions to the survey and pretest/posttest were adjusted to convey more precisely what the researcher expected.

Main Study

After permission was granted to be a part of the current study by the introductory aural skills teachers at each site, the Institutional Review Board application was submitted and approved (See Appendix A). The day of the pretest, each subject signed a consent form (See Appendix A). The researcher met with each instructor prior to the treatment to determine the

amount of time devoted to teaching rhythm in each aural skills class, which was approximately 10 minutes of a 50 minute class period that meets once a week for 8 class periods, though, the 1 e & a class met twice a week. The second day of the week was not focused around the rhythm patterns. Rhythm patterns were introduced as Ester (2010) recommends, which include (1) Neutral Echoing, (2) Syllable Echoing, (3) Echo-Translation, (4) Connecting Sound to Symbol, (5) Application and Practice, (6) Notating, (7) Melodic Reading (p. 67). The researcher also required the instructor and students to tap the beat when introducing rhythm patterns and chanting the melodic reading exercises, which is a kinesthetic activity recommended by Varley (2005). The researcher chose melodic reading exercises from the Ottman and Roger's (2010) book for each rhythm lesson that include rhythm patterns introduced during the current lesson and previous lessons. The reading exercises were chosen so the students could apply the macrobeat division and subdivision rhythm patterns to the context of a musical sentence, as recommended by Ester (2010) as a part of instructional sequencing, rooted in the philosophy of sound before symbol (p. 30-31).

Pretest

Prior to instruction, students completed Gordon's *Advanced Measures of Music Audiation* (*AMMA*), which was administered to each of the three classes as a whole. The researcher played the *AMMA* testing audio compact disc in a compact disc player. The compact disc provided directions to the students followed by musical excerpts and questions regarding the excerpts with answer options. The entire *AMMA* test took 15 to 20 minutes to administer and the test is intermixed with tonal and rhythm aptitude questions.

After the *AMMA* was administered, and during the same class period, a pretest designed by the researcher was administered. The pretest questionnaire provided the researcher with

demographic information and a small musical background including (1) the different types of rhythm systems that have been taught to the student, (2) the rhythm systems the student currently uses, (3) gender of student, (4), ethnicity of student, (5) age of student, (6) classification of year in college, and (7) instruments the student has played, both formal and informal, and the years of experience with each instrument (see Appendix B). The answers were compared to the rhythm system used in the respective aural skills classroom. Pretest post-test gains scores of students using the same rhythm system in the aural skills classroom as they used for reading rhythm were compared to gains scores of students using a different rhythm system in the aural skills classroom than used for reading rhythm.

The pretest performance questions consisted of exercises 15.118 (simple meter) and 13.62 (compound meter) from *Music for Sight Singing, 8th edition* by Ottman and Rogers (2010). The subjects had 30 seconds to view each exercise, then the subjects vocalized the rhythms using rhythm syllables of their choice with the metronome set to quarter note at 60 beats per minute. The rhythm chanting was video recorded using an iPOD. The pretest was scored by awarding one point to each beat pattern that was correctly chanted (Colley, 1987; Earney, 2008).

Treatment

The subjects attended their respective aural skills classrooms for eight weeks with ten minutes of the class period devoted to rhythm. One classroom used the Takadimi rhythm system to teach rhythm, another classroom used the McHose and Tibbs rhythm system, and the third classroom used Harr's rhythm system. The researcher taught one of the college courses and observed periodic instruction in the other two classes. The pedagogical method of presenting the rhythms was observed by video recording two of the eight classes on an iPOD (rather than video

recording all eight classes) taught by each instructor to assure the rhythms were introduced in uniform across each site.

Figure 3.1 represents the common rhythm patterns introduced and practiced during the ten-minute rhythm lessons. Suggested rhythm reading exercises by the researcher are indicated in Figure 3.2, which are exercises from *Music for Sight Singing, 8th edition*, by Ottman and Rogers (2010).

Figure 3.1 Rhythm Patterns Presented In Each Rhythm Lesson

Lesson Content	
Lesson 1	
Lesson 2	
Lesson 3	
Lesson 4	
Lesson 5	
Lesson 6	
Lesson 7	
Lesson 8	

Figure 3.2 Suggested Rhythm Reading Exercises for Each Lesson

Lesson 1: 1.11, 1.12, 1.16, 1.17, 1.20, 1.21, 10.1, 10.2
Lesson 2: 10.3, 10.4, 10.5, 10.7, 10.8, 10.9, 10.10, 10.11
Lesson 3: 15.40, 15.41, 15.42
Lesson 4: 4.2, 4.5, 4.7, 4.9, 4.11, 15.21, 15.23
Lesson 5: 10.33, 10.34, 10.35, 10.36, 10.37
Lesson 6: 10.38, 10.39, 10.40, 10.41
Lesson 7: 10.42, 10.43, 10.44
Lesson 8: 10.45, 10.46, 10.48, 10.49, 10.50

Rhythms were sequentially introduced as Ester (2010) recommended, which included (1) Neutral Echoing, (2) Syllable Echoing, (3) Echo-Translation, (4) Connecting Sound to Symbol, (5) Application and Practice, (6) Notating, (7) Melodic Reading (Ester, 2010, pg 67), using a kinesthetic activity such as tapping the beat, clapping the beat, or conducting (Varley, 2005). There was a brief amount of time devoted to review rhythms from previous class periods.

Posttest

After eight course periods, the subjects completed a posttest. The subjects had 30 seconds to view the exercises after which the subjects chanted the rhythms using rhythm syllable implemented in their respective class. The rhythm chanting was video recorded using an iPOD. The posttest was scored by awarding one point to each beat pattern that was correctly chanted (Colley, 1987; Earney, 2008).

The researcher and one other music professional holding a *Master of Music* degree and is the choral director, voice instructor, and a colleague of the researcher, scored the pretest and posttest by watching and listening to the recorded performances. One point was awarded to each of the correctly chanted macrobeats by using a checklist. A point was awarded if the correct rhythm was communicated by chanting using a rhythm system. When discrepancies occurred, the researcher and music professional revisited the point of discrepancy to determine if the

particular macrobeat should receive one point. The points were totaled on each of the pretests and posttests and input into an excel spreadsheet.

Analysis and Reporting

The pretest provided data to compare similarities and differences of each aural skill class. Demographics of ethnicity, musical experience, and experience with rhythm systems were compared within each class. Descriptive statistics were calculated for each group's pretest and *AMMA* scores, including the number of participants (N), mode, median, mean, range, variance, and standard deviation. The results of the pretest were compared across sites to determine if student achievement begins at equal places across each cohort of students. Due to the small number of subjects, advanced statistical analyses was inappropriate. Therefore, analyses included percentages of gain scores between the pretest and posttest.

The first research question "Is there a difference in achievement among rhythmic skills based on the instruction and usage of a specific rhythm system?" was analyzed by comparing the pretest to the posttest to determine the amount of gain of rhythm achievement. Gain scores were calculated for each subject by subtracting the pretest score from the posttest score, from which the mean scores from each group were calculated. Descriptive statistics were calculated for each group's post-test including the number of participants (*N*), mode, median, mean, range, variance, and standard deviation. Descriptive statistics and percentages for the gain scores were calculated to determine the improvement between the pretest and posttest of overall, with simple meter, and with compound meter rhythm patterns.

The second research question "Is there a difference in student achievement between students with low and high aptitude as measured by (AMMA) following instruction in a particular rhythm system?" was analyzed by calculating the descriptive statistics to determine if

there was a normal distribution for each of the groups (1 e & a, 1 ta te ta, Takadimi). The rhythm raw scores were converted to percentile ranks. As Gordon recommends, students that score greater than or equal to the 80th percentile on the *AMMA* are considered high-aptitude students, students that score greater than the 20th percentile but less than the 80th percentile on the *AMMA* were considered moderate aptitude students, and students that score less than or equal to the 20th percentile on the *AMMA* were considered low aptitude students (Conkling, 1994). If subjects of one rhythm syllable group with a low aptitude score higher on the post-test than a different rhythm syllable group, the results may suggest that the particular rhythm syllable system produces a higher level of rhythm achievement. *Excel* was used for calculating the descriptive statistics. Results from the data collection and analysis process are reported in Chapter IV. Conclusions and discussion of results are presented in Chapter V.

Chapter 4 - Results

No research has occurred in a college-level aural skills classroom to determine if rhythm systems of Takadimi, 1 e & a, or 1 ta te ta, lead to a difference in rhythm achievement. The challenge when teaching rhythmic patterns is selecting which rhythm system will more effectively contribute to student organization and transfer into rhythmic literacy. Every rhythm system can be organized on a spectrum of sound-based to symbol-based in which a variety of syllables are available to communicate either the beat placement within the measure or the rhythm attacks within the beat. The goal of each system should be to connect sound to symbol and symbol to sound, including understanding the organization of attacks into metrical structure, and to enhance musical performance (Ester, 2010; Hoffman, Pelto, & White, 1996; Gordon, 2012).

Purpose

The purpose of this study was to discover if differences exist in rhythm pattern achievement of three rhythm systems Takadimi, 1 e & a, and 1 ta te ta in the first level college aural skills classroom. The study implemented a pretest posttest quasi-experimental design.

Analysis was conducted to address the following research questions:

1. Is there a difference in achievement among rhythmic skills based on the instruction and usage of a specific rhythm system?

2. Is there a difference in student achievement between students with low and high aptitude as measured by (*AMMA*) following instruction in a particular rhythm system?

Demographics

Subject selection was comprised of students in the introductory aural skills courses at three small Midwest colleges. The subjects (N = 27) for the current study were undergraduate students enrolled in private colleges in a Midwest state. Frequency of the distribution of student population included twelve students (44.4%) at MWC-1, eleven students (40.7%) at MWC-2, and four students (14.8%) at MWC-3.

The ethnic distribution of subjects was primarily White (81.4%), with minorities consisting of African American (11.1%) and Latino (7.4%). The age range of the participants was from 18 to 21 years of age, with age 18 as the highest frequency (74%). Participants were 37% male and 63% female. The classification year in college of the participants included freshmen, sophomores, and juniors with the highest frequency of freshmen at 81.5%.

Students with experience playing an instrument and singing accounted for nearly one-third of the subjects in the current study at 37%, while 25.9% of the students had experience playing piano, playing another instrument, and singing. Students with experience only as vocalists accounted for 14.8% of the subjects in the current study while students with experience playing an instrument and piano, and students with experience only playing an instrument accounted for 11.1% and 11.1% of the subjects. The distribution of musical experience is located in Table 4.1.

Table 4.1 Distribution of Student Population: Musical Experience

Musical Experience	Frequency	Percent
Instrumental	3	11.1
Vocal	4	14.8
Instrumental and Vocal	10	37.0
Piano and Instrumental	3	11.1
Piano, Instrumental, and Vocal	7	25.9
Total	27	100.0

Data collected of rhythm systems students were taught and rhythm systems students used to read rhythm were similar to Varley's study. Both found the 1 e & a system to be the most popular that students were taught (94% Varley, 85% current study) and that students use to read rhythm (94%, Varley, 92% current study). The Kodály system was the next most popular that students were taught (7.6%, Varley, 15% current study), and that students use to read rhythm (1.4%, Varley, 7% current study). Mneumonic systems taught to students were (7.2%, Varley, 14%, current study) and used by students were (2.8% Varley, 0% current study). McHose and Tibbs system taught to students (3.6% Varley, 4% current study) and used by students (2.8% Varley, 4% current study). The current study indicated the TTTT system was taught to two (7%) students with one (4%) maintaining the system to read. The Dutadeta and Takadimi systems were each taught to one student, respectively. The distribution of rhythm systems is located in Table 4.2.

Table 4.2 Distribution of Student Population: Rhythm Systems

	1 e & a	Du ta de ta	TTTT	1 ta te ta	Ti ri ti ri	Takadimi	Car, Airplane
Taught to read rhythm	23	1	2	1	4	1	2
Currently read rhythm	26	0	1	1	2	1	0

Descriptive Statistics

The descriptive statistics for the *AMMA* scores, indicate the differences between the three groups MWC 1, MWC 2, and MWC 3. The range of *AMMA* scores is widest in MWC 2 (48-70), which also has the highest score. Though the range of MWC 1 (53-69) is narrower than MWC 2, the mean, median, and mode are higher in MWC 1 (59.167, 58 and 60, 60, respectively) than the other groups. MWC 3 had the least number of participants (N=4) and had the lowest range, mean, and median (40-53, 48.750, 50 and 52, respectively). The descriptive statistics for the *AMMA* scores are located in Table 4.3.

Pretest descriptive statistics indicate the mode, median, and mean were highest in MWC 1 (19, 13 and 18, 17.75) and the lowest in MWC 3 (0, 0 and 2, 3.5). The widest range occurred in MWC 2 (0-53) while the narrowest range occurred in MWC 3 (0-12). Pretest descriptive statistics are presented in Table 4.3.

Descriptive statistics of the posttest indicate higher mode, median, and mean with each of the groups. The mean between MWC 1, MWC 2, and MWC 3 was 22.83, 19.90, and 18.75, which was higher than the pretest means (17.75, 12.45, and 3.5). The highest scores of the range were within 11 points in proximity in the posttest between MWC 1 (50), MWC 2 (49), and MWC 3 (39). The standard deviation of the pretest scores were 5.745 (MWC 3), 15.616 (MWC

2), and 16.839 (MWC 1) compared to the posttest scores of 13.720 (MWC 3), 15.666 (MWC 1), and 16.979 (MWC 2). Descriptive statistics of the posttest are indicated in Table 4.3.

Table 4.3 Descriptive Statistics for the Pretest, Posttest, and AMMA Raw Scores

	N	Mode	Median	Mean	Range	Standard Deviation
MWC 1 AMMA	12	60	58 and 60	59.167	53-69	4.345
MWC 1 Pre	12	19	13, 18	17.75	0-48	16.839
MWC 1 Post	12	21	15, 21	22.83	5-50	15.666
MWC 2 AMMA	11	57	57	57.727	48-70	6.650
MWC 2 Pre	11	0, 12	11	12.45	0-53	16.616
MWC 2 Post	11	13	13	19.90	0-49	16.979
MWC 3 AMMA	4	-	50 and 52	48.750	40-53	5.965
MWC 3 Pre	4	0	0, 2	3.5	0-12	5.745
MWC 3 Post	4	-	12, 15	18.75	9-39	13.720

Each group had positive average gain scores for the simple meter patterns and combined meter patterns, while two groups had no average gain or a negative average gain of compound meter patterns within the further disaggregation of the groups into low, medium, and high aptitude. Average gain scores of MWC-1 include 2.25 for simple meter, 1.33 compound meter and 3.58 for combined meter patterns. MWC-2 gain scores include 5 for simple meter, 2.8 for compound, and 7.82 for combined meter patterns. MWC-3 had the most average gain with 5.5 for simple, 9.75 for compound, and 15.25 for the combined meter patterns. The disaggregation into high, medium, and low aptitude from each cohort includes gain scores from MWC-1 simple meter patterns and high aptitude at 5 and medium aptitude 2, with compound meter patterns and

high aptitude at 18 and medium aptitude -.18. Average gain scores at MWC-2 for simple meter patterns and high aptitude was 9, medium aptitude 4.63, and low aptitude 4.5, while compound meter patterns and high aptitude was 0, medium aptitude 3.88, and low aptitude was 0. MWC-3 average gain scores for simple meter patterns and medium aptitude was 5 and low aptitude 7, while compound meter patterns and medium aptitude was 6.23 and low aptitude was 20. Out of the fourteen disaggregated groups into high, medium, and low aptitude, eleven had positive gain scores while two had no gain and one had a negative gain.

Research Question Results

Question 1: Difference in achievement among rhythmic skills based on the instruction and usage of a specific rhythm system

Question 1 was stated: Is there a difference in achievement among rhythmic skills based on the instruction and usage of a specific rhythm system? There appears to be no difference between the systems. Due to the small number of subjects, advanced statistical analysis was inappropriate, therefore a significant difference was unable to be determined in achievement among rhythmic skills based on the instruction and usage of a specific rhythm system. To answer the first question, gains scores were calculated using the data obtained from the pretest and posttest. The mean gains scores and percentages were then calculated.

MWC 3, which implemented Takadimi, indicated the most growth from the pretest to the posttest with simple, compound, and combined rhythm patterns. The average simple rhythm score was 2.25 on the pretest and 7.75 on the posttest, representing a gain of 5.5, or a growth of 244%. The average compound meter score was 1.25 on the pretest and 11 on the posttest, representing a gain of 9.75, or a growth of 780%. The average combined meter score was 3.5 on the pretest and 18.75 on the posttest, representing a gain of 15.25, or a growth of 436%.

The average simple gains in MWC 2, which implemented 1 e & a, include an average gain of 5 with pretest average score of 7.09 and posttest at 12.09, or growth of 71%. The average scores for compound patterns was 5 on the pretest and 7.82 on the posttest representing a gain of 2.82, or growth of 56%. The average scores for combined patterns was 12.09 on the pretest and 19.91 on the posttest representing a gain of 7.82, or growth of 65%.

MWC 1 indicated the least amount of gain between all rhythm pattern scores. The average simple rhythm pretest score was 11.17 and posttest of 13.42 representing a gain of 2.25, or growth of 20%. The average scores for compound patterns was 8.08 on the pretest and 9.42 on the posttest representing a gain of 1.33, or growth of 17%. The average scores for combined patterns was 19.25 on the pretest and 22.83 on the posttest representing a gain of 3.58, or a growth of 19%.

While MWC 3 represented the most growth between pretest and posttest, the group started with a lower average score than each of the other groups. Data suggests that regardless of the rhythm system implemented, on average, subjects improved rhythm reading skills between the pretest and posttest.

The percentages of growth between the different systems is indicated below in Table 4.4.

Table 4.4 Rhythm System Gains by Metrical Pattern and Aptitude Level

	1 ta te ta	1 e & a	Takadimi
Simple	20%	71%	244%
Compound	17%	56%	780%
Combined	19%	65%	436%
Low Aptitude	-	900%	225%
Medium Aptitude	9%	71%	1700%
High Aptitude	177%	225%	-

Question 2: Difference in achievement between students with low and high aptitude following instruction in a particular rhythm system

Question 2 was stated: Is there a difference in student achievement between students with low and high aptitude as measured by (*AMMA*) following instruction in a particular rhythm system? Due to the small number of subjects, advanced statistical analysis was not practical and significance could not be determined. However, gains scores were calculated using the data obtained from the pretest and posttest. The scores for each rhythm system were then disaggregated by low, medium, and high aptitude of the subjects. Average gains and percentages were calculated of the combined simple and compound rhythm patterns to determine the improvement of subjects by rhythm system and by aptitude level.

Subjects at MWC-1 included eleven subjects representing medium aptitude and one subject representing a high aptitude. The average gain scores of the medium aptitude subjects was 1.82, or growth of 9%. The gain score of the subject with a high aptitude was 23, or a growth of 177%.

Subjects at MWC-2 included two subjects representing low aptitude, eight subjects representing medium aptitude, and one subject representing a high aptitude. The average gain scores of the low aptitude subjects was 4.5, or growth of 900%. The average gain scores of the medium aptitude subjects was 11.36, or growth of 71%. The gain score of the subject with a high aptitude was 9, or growth of 225%.

Subjects at MWC-3 included one subject representing low aptitude and three subjects representing a medium aptitude. The gain score of the subject with a low aptitude was 27, or growth of 225%. The average gain scores of medium aptitude subjects was 11.33, or growth of 1700%.

Data suggest that on average, subjects of different aptitude levels improved rhythm reading skills between the pretest and posttest. Each group of rhythm systems represented the highest growth in a different aptitude level as indicated in Table 4.4.

Summary

The first research question focused on a difference in achievement among aural skills students when implementing a specific rhythm system. Results from the study indicate improvement between pretest and posttest of usage of each rhythm system, but no significance of achievement with a specific rhythm system.

The second research question focused on the difference in achievement between students with low and high aptitude following instruction using a specific rhythm system. Results indicate improvement between pretest and posttest of each aptitude level group, but no significance of achievement by rhythm system and aptitude level.

Chapter 5 - Discussion and Conclusions

Introduction

The purpose of this study was to discover if rhythmic achievement of students in the introductory college aural skills class was impacted by the employment of specific rhythm systems Takadimi, 1 e & a, or 1 ta te ta. Rhythm literacy is a necessary component of musicianship but is a deficiency among collegiate music education students (Ester, 2010). Rhythm literacy is the strongest contributor to high sight-reading scores. The ability to sight-read contributes to the amount of time to learn music (Elliot, 1982; Henry, 2011).

Overview

The study was administered in three colleges in a Midwest state. The subjects (N = 27) were members of an introductory level aural skills class in their respective college. Instruments of a demographics questionnaire, musical aptitude test, pretest and posttest were implemented for data collection to answer the research questions. The demographics questionnaire was created by the researcher and literature-supported to gain profile information about the subjects. The musical aptitude test was Gordon's *AMMA* designed to score the musical aptitude of college students. The pretest and posttest were researcher-generated that included common rhythmic patterns.

The questionnaire, *AMMA*, pretest, and posttest were administered to subjects in the fall semester of 2015. All tests but the posttest were administered in the first aural skills class period of the semester, followed by eight weeks of rhythm lessons (one lesson per week). The posttest was administered the day of the last rhythm lesson. Data were processed and analyzed to acquire results, form conclusions, and cultivate implications.

The findings related to the first research question *Is there a difference in achievement among rhythmic skills based on the instruction and usage of a specific rhythm system* are congruent with Fust's (2006) study that indicated no difference in achievement using rhythm systems Takadimi and 1 e & a. The intermediate-level musicians already began rhythm reading with the 1 e & a system which is similar to the subjects in the current study. However, differences of Fust's study include the qualitative approach, the treatment length was five weeks, and the number of participants were four sixth-grade woodwind players from one school district.

The findings of the current study were consistent with Colley (1987) and Earney's (2008) findings in that on average, scores increased between the pretest and posttest. Colley found that elementary students had a more difficult time chanting the rhythms of the syllable systems that were not associated with words.

The findings related to the second research question *Is there a difference in student achievement between students with low and high aptitude as measured by (AMMA) following instruction in a particular rhythm system* are congruent to Conkling's (1994) findings that no significance was found between treatment and aptitude. However, Conkling found significance in higher scores of vocal students taught with a learning sequence than vocal students taught with vocal exercises in solo performance. Conkling also found that students with higher aptitude levels performed at higher levels of music achievement, which is consistent with Gordon's (1989) findings.

Discussion and Conclusions

Research Question 1: Is there a difference in achievement among rhythmic skills based on the instruction and usage of a specific rhythm system?

A significant difference was unable to be determined of rhythm pattern achievement between the three systems. One reason for the lack of significance is due to the small sample that prevented implementation of advanced statistical analysis. However, improvement was revealed in rhythm reading that occurred from the pretest to the posttest, which is consistent with Earney's (2008) study and Boyle's (1970) study. As seen in Table 4.3, the average scores of the pretest and posttest for MWC-1 was 17.75 and 22.83; for MWC-2 pretest and posttest average scores were 12.45 and 19.90; and for MWC-3 the average scores were 3.5 and 18.75. By comparing the mean between pretest and posttest, each group scored higher on the posttest by at least 5.08. The range of scores also indicates improvement between MWC-1 and MWC-3, which improved from 0-48 to 5-50 and 0-12 to 9-39, respectively. Improvement is indicated between all aptitude levels ranging from 9% from the medium aptitude level of the 1 ta te ta system to 1700% from the medium aptitude level of the Takadimi system, as seen in Table 4.4.

However, when disaggregated into high, medium, and low aptitude and simple, compound, and combined metrical patterns among each college, two groups had gain scores of zero (MWC-2 high and low aptitude compound) and one group had a negative gain score (MWC-1 high aptitude compound) of -.18. This may indicate that due to the more variety of rhythmic patterns that occur in compound meter, more instructional time or practice time may need to be devoted to compound meter rhythms.

Each of the three aural skills classes began with different levels of competency but by the end of the study, each of the classes scored closely together. The range of the average scores between the three groups is narrower on the posttest (difference of 4.08) than on the pretest (difference of 14.25), as seen in Table 4.3. This indicates that regardless of the competency level

at the beginning of a course, students can achieve at the level determined by the learning objectives and curriculum by the end of the course.

Students' improvements in rhythm reading indicate that progress and achievement can be independent of using any of the three rhythm systems. Varley (2005) found that 66% of teachers surveyed teach with the rhythm system they find most comfortable and were not sure they would change the rhythm system if presented with research that another system was better than another. This finding may also contribute to student attitudes of rhythm system preference. As indicated in chapter four, 85% of the subjects were taught with the 1 e & a system to read music but 92% currently use the 1 e & a system to read music. This could be the result of movement from a non-1 e & a ensemble to a music ensemble where the teacher uses the 1 e & a system. If adapting to a new rhythm system is too challenging, students may revert back to the rhythm system with which they are comfortable, which may contribute to negative attitudes towards the class or the teacher.

Further study with a larger sample size may reveal a difference in effectiveness between rhythm systems, which would be congruent to what Bacon, Pearsall, and Colley found in the elementary classroom. Bacon (1998) found that beginning band students who were taught rhythm using Gordon's Du ta de ta system and no rhythm system performed compound meter patterns better than students taught the 1 e & a system. Pearsall (2009) concluded that when measuring tempo consistency, Kodály and Gordon rhythm systems are more effective than the 1 e & a system. Three factors Colley found that contributed to rhythm system effectiveness include (1) how easily syllables could be recalled, (2) whether or not the syllables provide a reference point for the macrobeat, and (3) the extent of differentiation of simple and compound metrical patterns.

Research Question 2: Is there a difference in student achievement between students with low and high aptitude as measured by *AMMA* following instruction in a particular rhythm system?

A significant difference was unable to be determined of student achievement between students with low and high aptitude following instruction in a particular rhythm system. Lack of significance is due to the small sample that prevented implementation of advanced statistical analysis. However, as seen in table 4.3, the aptitude level range was wider as a whole but not wider between schools with scores ranging between 53-69 (MWC-1), 48-70 (MWC-2), and 40-53 (MWC-3). Schools are performing as they should as indicated by the *AMMA*, which conveys that the *AMMA* is consistent with Gordon's (1989) indication that the test is a valid and reliable source for measuring music aptitude among college students.

The variety of success on the pretest by subjects indicates that upon entering college, students were at different levels of musical achievement as determined by rhythm reading and chanting. Subjects were homogenous in musical achievement by the end of the study as indicated by the posttest, as seen in table 4.3. This communicates that students who exhibit a low musical aptitude when entering an aural skills course can develop skills to meet the learning objectives of the curriculum.

Recommendations for Further Research

Because this is a preliminary study with a small number of subjects, the results of this study are not generalizable to larger populations. However, the results and implications have guided the suggestions for future research. A replication of the study could be implemented but with a larger population to determine if the same treatment yields similar results. The researcher should not be the instructor, but rather communicate instructions to effectively implement

procedures of treatment. Because students' musical aptitude has peaked prior to college, an implementation of this study in regards to the *AMMA* could be with a population of middle school or high school students.

In conclusion, this study was the first to compare rhythm systems in the college aural skills course. While no specific rhythm system was found to facilitate rhythm pattern recognition more than another rhythm system, each group of aural skills students showed improvement on scores of rhythm chanting from the pretest to the posttest. Music educators should continue developing our pedagogy through research to facilitate rhythmic literacy so students can acquire a deeper understanding of music.

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Appendix A - Informed Consent Template

KANSAS STATE UNIVERSITY

INFORMED CONSENT TEMPLATE (with instructions)

(If you are performing research involving human subjects, it is your responsibility to address the issue of informed consent. This template is intended to provide guidance for crafting an informed consent document. The Committee for Research Involving Human Subjects (IRB*) strongly* recommends that you model your consent form on this template. However, if you choose a different approach, it must contain at a minimum the same elements as this standard version. Language and terminology used in the consent form must be written at no more than the 8th grade level, so that the potential participant can clearly understand the project, how it is going to be conducted, and all issues that may affect his or her participation. In addition, please write the consent form in a manner that addresses your subjects directly instead of writing it in a manner that addresses the University Research Compliance Office directly. KANSAS STATE UNIVERSITY

INFORMED CONSENT TEMPLATE

PROJECT TITLE: A Preliminary Comparative Study of Rhythm Systems Employed within the First Year College Aural Skills Class

APPROVAL DATE OF PROJECT: March, 2012 EXPIRATION DATE OF PROJECT: December, 2015

PRINCIPAL INVESTIGATOR: CO-INVESTIGATOR(S): Professor F. Burrack, Brett Janssen

CONTACT AND PHONE FOR ANY PROBLEMS/QUESTIONS: 816-916-1600

IRB CHAIR CONTACT/PHONE INFORMATION: Dr. Rick Scheidt

SPONSOR OF PROJECT: n/a

PURPOSE OF THE RESEARCH: Dissertation

PROCEDURES OR METHODS TO BE USED: Demographics Survey, Pretest and posttest, Observations

ALTERNATIVE PROCEDURES OR TREATMENTS, IF ANY, THAT MIGHT BE ADVANTAGEOUS TO SUBJECT:
none

LENGTH OF STUDY: One semester (Fall 2015)

RISKS ANTICIPATED: none

BENEFITS ANTICIPATED: Participating instructors will benefit from learning their student's music aptitude. Skill development for student collecting data for dissertation.

EXTENT OF CONFIDENTIALITY: Anonymous (all identifying names and characteristics will be removed before submitting data collection exercise) and will not have any effect on the students' grades.

IS COMPENSATION OR MEDICAL TREATMENT AVAILABLE IF INJURY OCCURS: n/a

PARENTAL APPROVAL FOR MINORS:

TERMS OF PARTICIPATION: I understand this project is research, and that my participation is completely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits, or academic standing to which I may otherwise be entitled.

I verify that my signature below indicates that I have read and understand this consent form, and willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form.

(Remember that it is a requirement for the P.I. to maintain a signed and dated copy of the same consent form signed and kept by the participant

Participant Name: _____ **Date:** _____

Participant Signature: _____ _____

Witness to Signature: (project staff) _____ **Date:** _____

Appendix B - Pretest and Posttest

Pretest Instructions: The pretest consists of two steps. Follow Step 1 then proceed to Step 2.

Step 1.

This demographics questionnaire is designed to gather information about your background. It includes questions about your ethnicity, age, sex, and musical experiences. Your identity will be kept confidential.

1. Name: _____
2. Ethnic Origin: Please circle the category that applies.
    a. African American
    b. Asian American
    c. Caucasian
    d. Native American
    e. Latino (Hispanic)
    f. Pacific Islanders
    g. Other (specify):_____
3. Age: _____
4. Sex:
    a. Male
    b. Female
5. Year: Please circle the category that applies
    a. Freshman
    b. Sophomore
    c. Junior
    d. Senior
    e. Post Bachelor
    f. Other (specify):_____
6. Musical experience: Please list all the instruments you have ever played and estimate how long you have played them.

Instrument(s) played or Voice	Year(s) played
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

7. How were you taught to read rhythms? (Circle all that apply)

    a. 1 2 & 3e&a 4
    b. Du Du de Du ta de ta Du
    c. 1 2 Te 3 Ta Nee Te 4

d. Too Ta Ta TTTT Too
e. 1 2 Te 3 ta t eta 4
f. Ta Ti Ti Ti Ri Ti Ri Ta
g. Ta Ta Di Ta ka di mi Ta
h. Car Airplaine Mississippi Car (or other words)
i. Other (Please Specify) _____

8. How do you read rhythms now? (Circle one that applies)

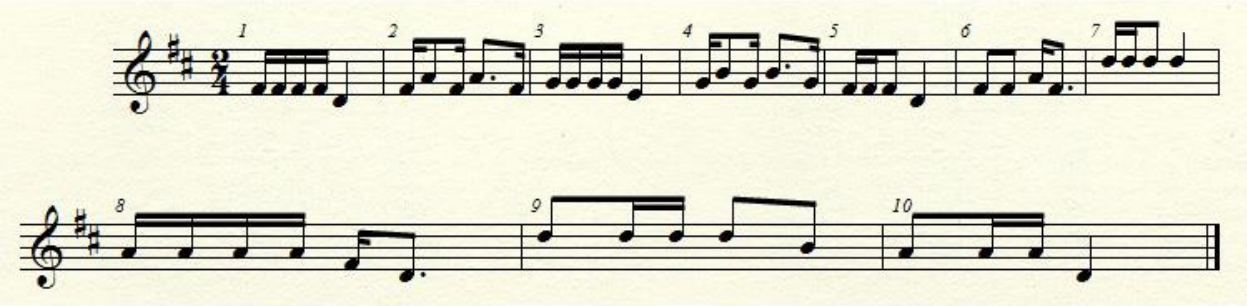
a. 1 2 & 3e&a 4
b. Du Du de Du ta de ta Du
c. 1 2 Te 3 Ta Nee Te 4
d. Too Ta Ta TTTT Too
e. 1 2 Te 3 ta t eta 4
f. Ta Ti Ti Ti Ri Ti Ri Ta
g. Ta Ta Di Ta ka di mi Ta
h. Car Airplaine Mississippi Car (or other words)
i. Other (Please Specify) _____

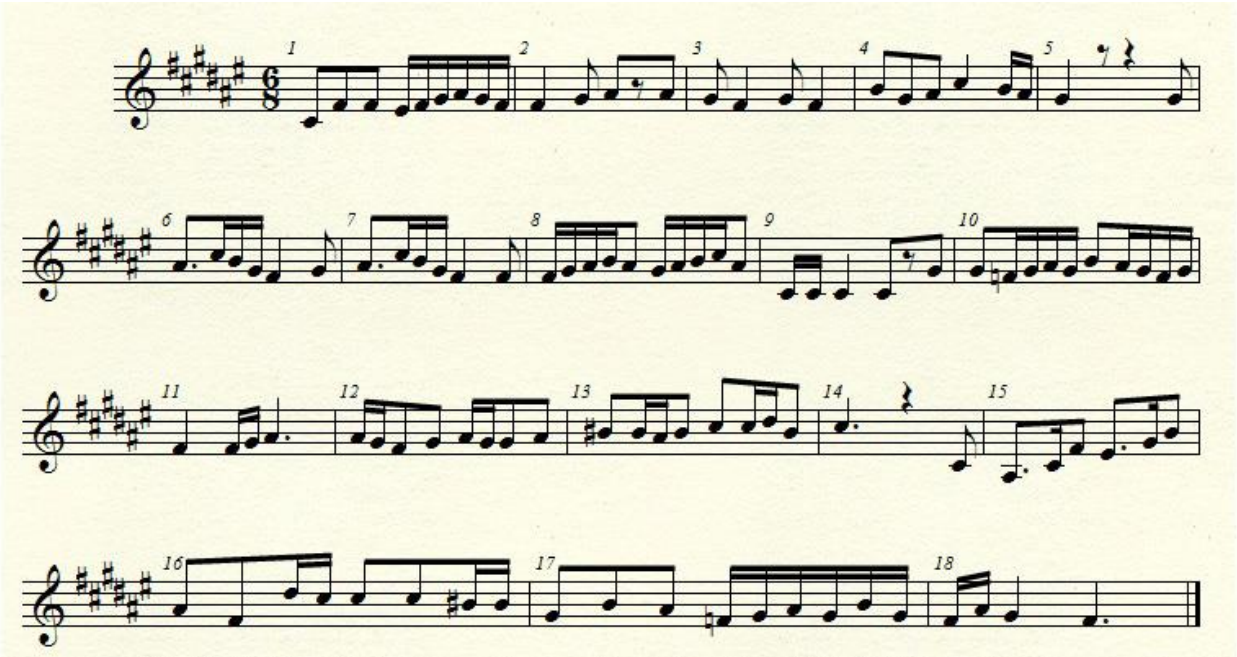
Step 2.

There are two melodic exercises, the first exercise is in 2/4 time signature and the second exercise is in 6/8 time signature. You will have 30 seconds to view the first melodic exercise. Following the 30 seconds, you will hear a metronome (macrobeat at 60 beats per minute). Chant the rhythm using the rhythm system you are most comfortable with. Once you begin, do your best to chant the entire exercise without stopping. Then proceed to the next exercise.

You will have 30 seconds to view the second melodic exercise. Following the 30 seconds, you will hear a metronome (macrobeat at 60 beats per minute). Chant the rhythm using

the rhythm system you are most comfortable with. Once you begin, do your best to chant the entire exercise without stopping.

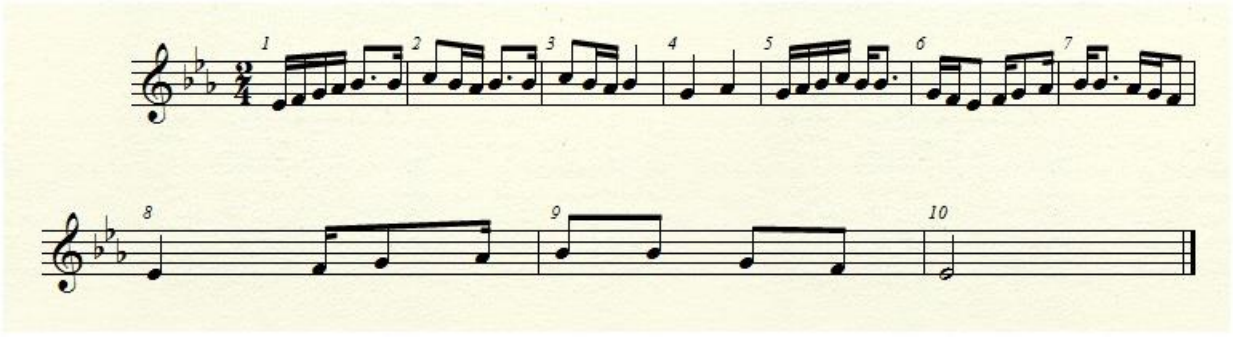


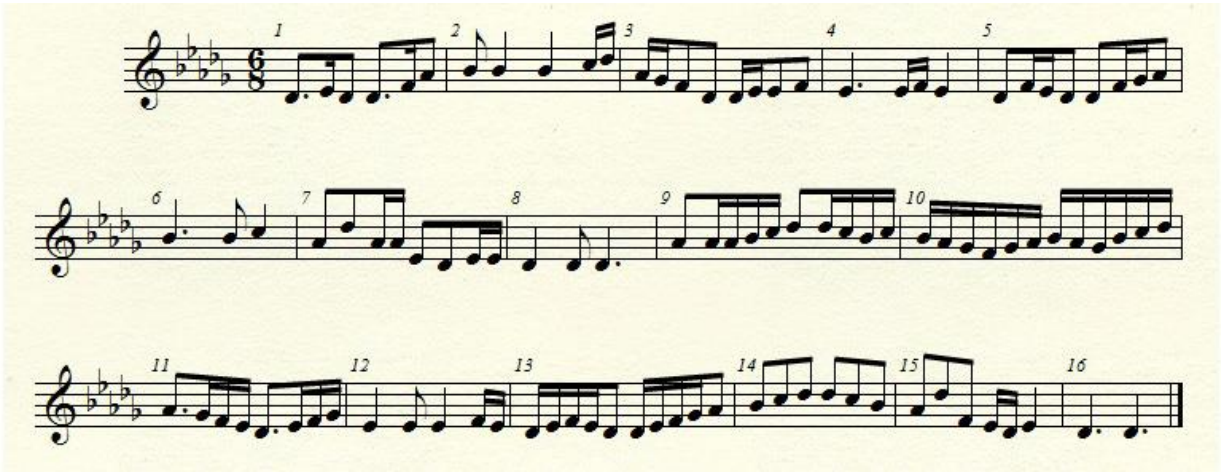


Post-test Instructions:

There are two melodic exercises, the first exercise is in 2/4 time signature and the second exercise is in 6/8 time signature. You will have 30 seconds to view the first melodic exercise. Following the 30 seconds, you will hear a metronome (macrobeat at 60 beats per minute). Chant the rhythm using the rhythm system you are most comfortable with. Once you begin, do your best to chant the entire exercise without stopping. Then proceed to the next exercise.

You will have 30 seconds to view the second melodic exercise. Following the 30 seconds, you will hear a metronome (macrobeat at 60 beats per minute). Chant the rhythm using the rhythm system you are most comfortable with. Once you begin, do your best to chant the entire exercise without stopping.





Appendix C - Lesson Plans

Below are the lesson plans for each 10 minute rhythm lessons:

Materials for each lesson: Students will need a pencil and paper (staff paper is not necessary).

Completing each task: Each task may be repeated until 80% of the class accomplishes the task.

Lesson 1 

(1) Neutral Echoing – With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on "pa" and have students echo, then do this with each 4 beat pattern.

(2) Syllable Echoing - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and have students echo, then do this with each 4 beat pattern.

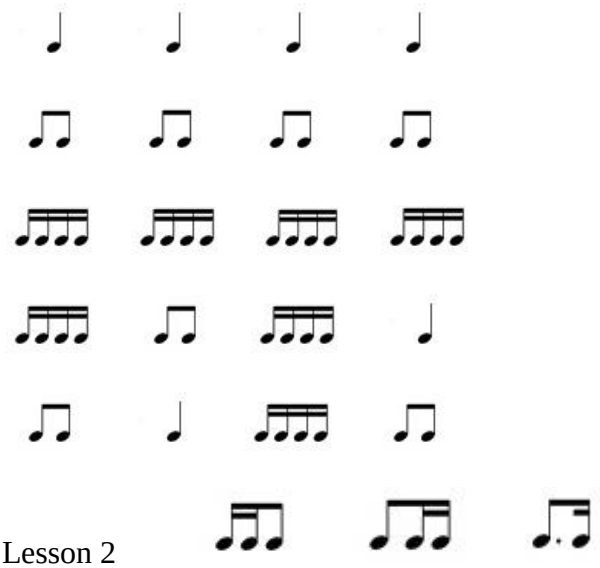
(3) Echo-Translation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on "pa" and have students translate to the rhythm syllables, chanting, then do this with each 4 beat pattern.

(4) Connect Sound to Symbol - draw the notation of each four-beat pattern for the class to see.

(5) Notation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and students will notate the pattern, then do this with each 4 beat pattern. Students can check a partners notation for further rhythm notation understanding.

(6) Rhythm Reading - Bring to light any musical qualities of the rhythm phrases, such as anacrusis, rhythmic cadence, any areas that may be tricky, (30 seconds to 1 minute). Then the

instructor and students tapping the beat at 60 bpm while the class chants the rhythm of 1.11, 1.17, 10.2



Lesson 2

(1) Neutral Echoing – With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on “pa” and have students echo, then do this with each 4 beat pattern.

(2) Syllable Echoing - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and have students echo, then do this with each 4 beat pattern.

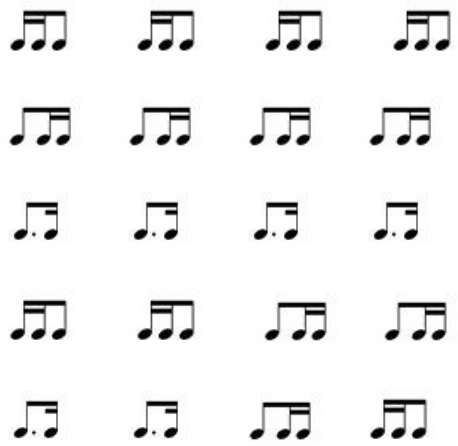
(3) Echo-Translation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on “pa” and have students translate to the rhythm syllables, chanting, then do this with each 4 beat pattern.

(4) Connect Sound to Symbol - draw the notation of each four-beat pattern for the class to see.

(5) Notation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and students will notate the pattern, then do

this with each 4 beat pattern. Students can check a partners notation for further rhythm notation understanding.

(6) Rhythm Reading - Bring to light any musical qualities of the rhythm phrases, such as anacrusis, rhythmic cadence, any areas that may be tricky, (30 seconds to 1 minute). Then the instructor and students tapping the beat at 60 bpm while the class chants the rhythm. 10.5, 10.7, 10.10



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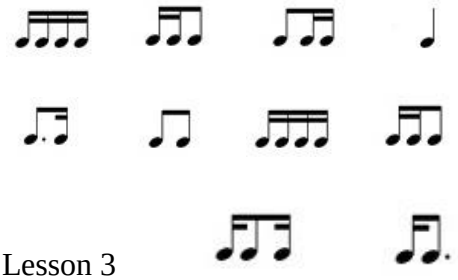


Lesson 3

(1) Neutral Echoing – With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on “pa” and have students echo, then do this with each 4 beat pattern.

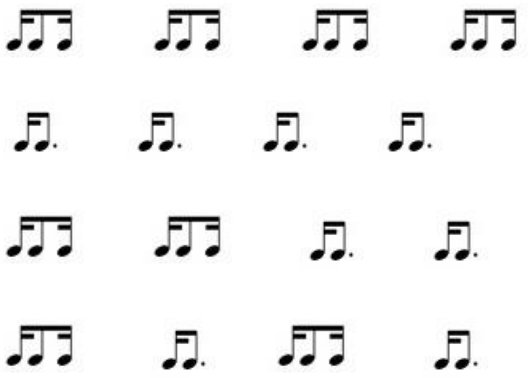
(2) Syllable Echoing - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and have students echo, then do this with each 4 beat pattern.

(3) Echo-Translation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on “pa” and have students translate to the rhythm syllables, chanting, then do this with each 4 beat pattern.

(4) Connect Sound to Symbol - draw the notation of each four-beat pattern for the class to see.

(5) Notation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and students will notate the pattern, then do this with each 4 beat pattern. Students can check a partners notation for further rhythm notation understanding.

(6) Rhythm Reading - Bring to light any musical qualities of the rhythm phrases, such as anacrusis, rhythmic cadence, any areas that may be tricky, (30 seconds to 1 minute). Then the instructor and students tapping the beat at 60 bpm while the class chants the rhythm. 15.40, 15.41, 15.42



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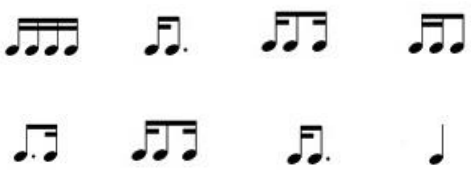


Lesson 4 

(1) Neutral Echoing – With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on “pa” and have students echo, then do this with each 4 beat pattern.

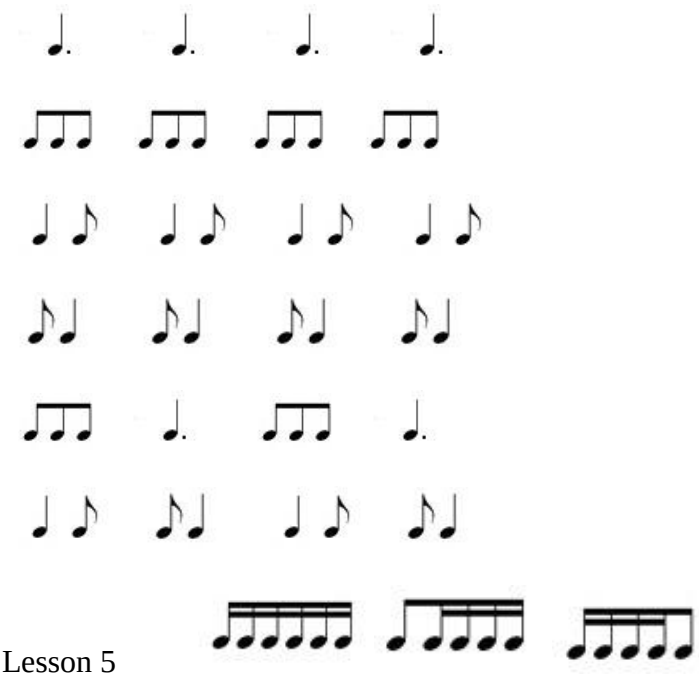
(2) Syllable Echoing - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and have students echo, then do this with each 4 beat pattern.

(3) Echo-Translation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on “pa” and have students translate to the rhythm syllables, chanting, then do this with each 4 beat pattern.

(4) Connect Sound to Symbol - draw the notation of each four-beat pattern for the class to see.

(5) Notation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and students will notate the pattern, then do this with each 4 beat pattern. Students can check a partners notation for further rhythm notation understanding.

(6) Rhythm Reading - Bring to light any musical qualities of the rhythm phrases, such as anacrusis, rhythmic cadence, any areas that may be tricky, (30 seconds to 1 minute). Then the instructor and students tapping the beat at 60 bpm while the class chants the rhythm. 4.2, 4.9, 15.23



Lesson 5

(1) Neutral Echoing – With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on “pa” and have students echo, then do this with each 4 beat pattern.

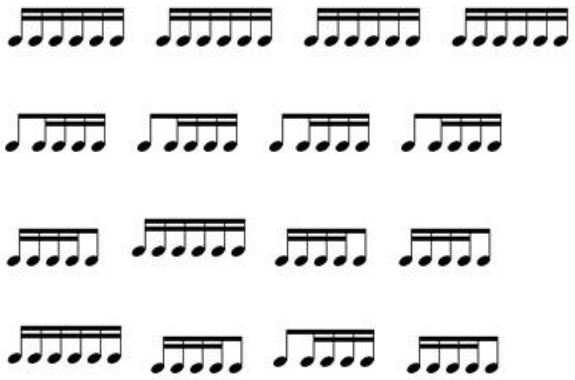
(2) Syllable Echoing - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and have students echo, then do this with each 4 beat pattern.

(3) Echo-Translation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on “pa” and have students translate to the rhythm syllables, chanting, then do this with each 4 beat pattern.

(4) Connect Sound to Symbol - draw the notation of each four-beat pattern for the class to see.

(5) Notation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and students will notate the pattern, then do this with each 4 beat pattern. Students can check a partners notation for further rhythm notation understanding.

(6) Rhythm Reading - Bring to light any musical qualities of the rhythm phrases, such as anacrusis, rhythmic cadence, any areas that may be tricky, (30 seconds to 1 minute). Then the instructor and students tapping the beat at 60 bpm while the class chants the rhythm. 10.35, 10.36, 10.37



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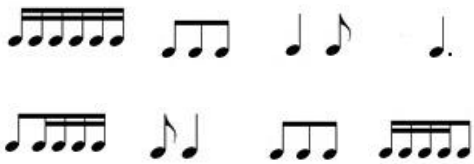


Lesson 6

(1) Neutral Echoing – With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on "pa" and have students echo, then do this with each 4 beat pattern.

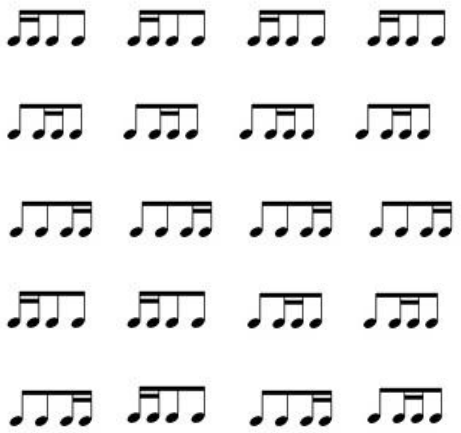
(2) Syllable Echoing - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and have students echo, then do this with each 4 beat pattern.

(3) Echo-Translation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on “pa” and have students translate to the rhythm syllables, chanting, then do this with each 4 beat pattern.

(4) Connect Sound to Symbol - draw the notation of each four-beat pattern for the class to see.

(5) Notation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and students will notate the pattern, then do this with each 4 beat pattern. Students can check a partners notation for further rhythm notation understanding.

(6) Rhythm Reading - Bring to light any musical qualities of the rhythm phrases, such as anacrusis, rhythmic cadence, any areas that may be tricky, (30 seconds to 1 minute). Then the instructor and students tapping the beat at 60 bpm while the class chants the rhythm. 10.38, 10.39, 10.41



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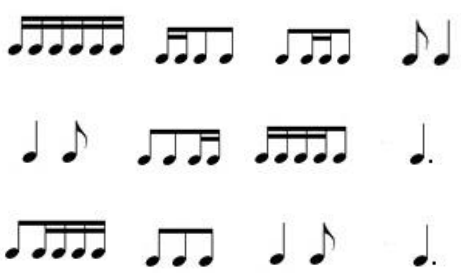


Lesson 7 

(1) Neutral Echoing – With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on “pa” and have students echo, then do this with each 4 beat pattern.

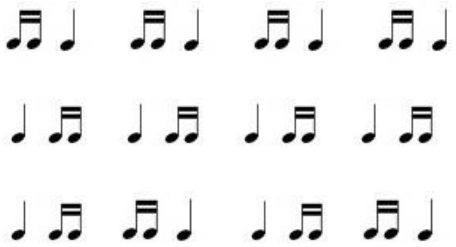
(2) Syllable Echoing - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and have students echo, then do this with each 4 beat pattern.

(3) Echo-Translation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on “pa” and have students translate to the rhythm syllables, chanting, then do this with each 4 beat pattern.

(4) Connect Sound to Symbol - draw the notation of each four-beat pattern for the class to see.

(5) Notation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and students will notate the pattern, then do this with each 4 beat pattern. Students can check a partners notation for further rhythm notation understanding.

(6) Rhythm Reading - Bring to light any musical qualities of the rhythm phrases, such as anacrusis, rhythmic cadence, any areas that may be tricky, (30 seconds to 1 minute). Then the instructor and students tapping the beat at 60 bpm while the class chants the rhythm. 10.42, 10.43, 10.44



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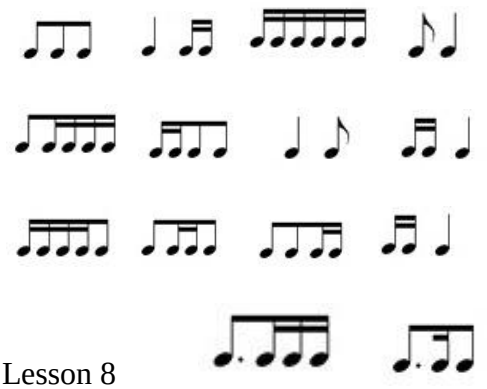


Lesson 8

(1) Neutral Echoing – With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on “pa” and have students echo, then do this with each 4 beat pattern.

(2) Syllable Echoing - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and have students echo, then do this with each 4 beat pattern.

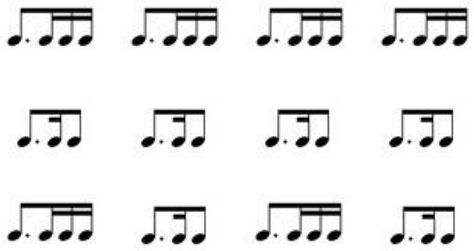
(3) Echo-Translation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on “pa” and have students translate to the rhythm syllables, chanting, then do this with each 4 beat pattern.

(4) Connect Sound to Symbol - draw the notation of each four-beat pattern for the class to see.

(5) Notation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and students will notate the pattern, then do this with each 4 beat pattern. Students can check a partners notation for further rhythm notation understanding.

(6) Rhythm Reading - Bring to light any musical qualities of the rhythm phrases, such as anacrusis, rhythmic cadence, any areas that may be tricky, (30 seconds to 1 minute). Then the

instructor and students tapping the beat at 60 bpm while the class chants the rhythm. 10.45, 10.49, 10.50



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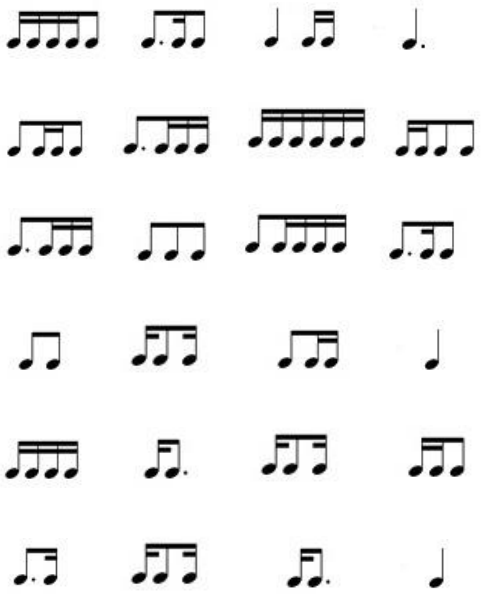

Suggested Rhythm Reading exercises from *Music for Sight Singing, 8th edition* by Ottman and Rogers:

Lesson 1: 1.11, 1.12, 1.16, 1.17, 1.20, 1.21, 10.1, 10.2
Lesson 2: 10.3, 10.4, 10.5, 10.7, 10.8, 10.9, 10.10, 10.11
Lesson 3: 15.40, 15.41, 15.42
Lesson 4: 4.2, 4.5, 4.7, 4.9, 4.11, 15.21, 15.23
Lesson 5: 10.33, 10.34, 10.35, 10.36, 10.37
Lesson 6: 10.38, 10.39, 10.40, 10.41
Lesson 7: 10.42, 10.43, 10.44
Lesson 8: 10.45, 10.46, 10.48, 10.49, 10.50

Rhythms will be sequentially introduced as Ester (2010) recommends, which includes (1) Neutral Echoing, (2) Syllable Echoing, (3) Echo-Translation, (4) Connecting Sound to Symbol, (5) Application and Practice, (6) Notating, (7) Melodic Reading (Ester, 2010, pg 67), using a kinesthetic activity such as tapping the beat, clapping the beat, or conducting (Varley, 2005). There will be a brief amount of time devoted to review rhythms from previous class periods.

Appendix D - Observation Guide for Rhythm Lessons

Rhythm lesson start time:_____

Rhythm lesson end time: _____

1. The rhythm patterns for the particular lesson were introduced as recommended by the researcher (Ester 2010):

(1) Neutral Echoing – With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on "pa" and have students echo, then do this with each 4 beat pattern.

(2) Syllable Echoing - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and have students echo, then do this with each 4 beat pattern.

(3) Echo-Translation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on "pa" and have students translate to the rhythm syllables, chanting, then do this with each 4 beat pattern.

(4) Connect Sound to Symbol - draw the notation of each four-beat pattern for the class to see.

(5) Notation - With the instructor and students tapping the beat at 60 bpm, the instructor will chant the four-beat pattern on the rhythm syllables and students will notate the pattern, then do this with each 4 beat pattern. Students can check a partners notation for further rhythm notation understanding.

Yes_____ No_____

Comment:_____

_____

2. The Rhythm Reading occurs next. The instructor brings to light any musical qualities of the rhythm phrases, such as anacrusis, rhythmic cadence, any areas that may be tricky, (30 seconds to 1 minute).

Yes_____ No_____

Comment:_____

_____

3. Then the instructor and students tapping the beat at 60 bpm while the class chants the rhythm of rhythm exercises chosen by the researcher.

Yes_____ No_____

Comment:_____

_____

4. The rhythm reading covered in class is assigned as homework to be performed using rhythm syllables for the next week.

Yes_____ No_____

Comment:_____

_____