

THE BEAT GOES ON: THE CONNECTIONS
BETWEEN PITCH MATCHING AND BEAT COMPETENCY
IN THE READING PROFICIENCIES OF THIRD GRADERS

By

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This work is dedicated to my many students throughout the years who have educated me in what it means to love music and to love learning.

AUTOBIOGRAPHICAL SKETCH

I was born Lori Ellen Conlon on December 30, 1958, in Great Falls, Montana, to Patty and Clifford Conlon. After attending schools in Montana, Wyoming, and Colorado, I graduated in 1977 from my parents' alma mater, Saco High School, in Saco, Montana, a small rural town on the Northeastern plains of Montana. I graduated with a B.A. in Music Education, K-12, from Rocky Mountain College in Billings, Montana, in 1982, and took my first full-time teaching position, K-12 Music, in Wilder, Idaho.

After deciding the small school music position wasn't for me, I began in the Boise School District in 1984 as a General Music Specialist, K-6, and have successfully remained in that position until today. I have served as a General Music teacher and Choir Director at Garfield, Valley View, Koelsch, and Horizon Elementary schools. For a period of ten years, while raising my own children, I taught part-time for the Boise Schools as well as pre-school and kindergarten music at Northview Montessori School.

Throughout my many years of teaching, I have employed the practices of Orff Schulwerk, an active and creative way of making music with children. I hold certification in Levels I, II, III, and a Master Class certificate with the Belgian composer, Jos Wuytack.

I graduated with a M.Ed. degree in Integrated Teaching Through the Arts from Lesley University in 2007, which culminated in my thesis project, *A Place Where the Arts Are Academic and the Academics Artful: An Arts Based Elementary School in the*

Boise School District, a blueprint for an arts-based elementary school for our district. With renewed aspirations in higher education and educational leadership, I began my doctoral work at Boise State University that same summer.

I am presently enjoying adjunct work at both Boise State University and Lesley University in the areas of Music Education and Curriculum.

ABSTRACT

Children who are poor readers in their early years generally remain poor readers in their later years. Research questions explore positive connections between learning music and learning to hear, understanding the spoken word, and, ultimately, reading the printed word. A series of 12 lessons created to improve internal rhythmicity and practice pitch matching skills were administered by general music specialists to a treatment group of third grade students (n=15) reading below grade level, over a period of 12 weeks. Treatment group results were compared to a control group (n=10) who did not receive musical intervention. The research examined the reading fluency, beat competency, and pitch matching of the treatment and control groups pre- and post-test. Findings show promise in using daily musical interventions, employing pulse, pitch, and reading walks to assist struggling readers in improving fluency, and point to the importance of including music in the elementary school curriculum. Musical interventions can be a highly engaging, active, and fun way to assist our most needy students in their quest to unlock the mystery of learning to read.

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CHAPTER ONE: INTRODUCTION

Background

I started to think about the connections between music and reading early on in my teaching career. It was a simple observation: In assigning special parts for music programs to my students, I began to realize that the same names were reappearing on each list of students who could potentially perform well on speaking parts, dancing parts, instrument parts, or on a vocal solo. It was the students who couldn't match pitch for a solo part or keep a steady pulse with the music throughout a dance or play an instrument rhythm accurately that I had trouble assigning a part. Those special children were sign holders or costumed characters, ribbon twirlers, or instrument parts that didn't require much accuracy. I concluded that there must be some kind of a connection between success in the music room and success in the classroom, the somewhat innate epistemological realism that I have been a part of for over 25 years. It is reassuring and empowering that, through a pilot study with eight- and nine-year olds, I was able to demonstrate that innate knowledge gleaned over those years. The ability to discern and replicate a steady pulse and the ability to match a vocal model in sound frequency is significantly correlated to reading fluency (Conlon Khan, 2009).

Similar evidence of the connections between good musical discrimination skills and reading development are echoed in other bodies of research. Atterbury's seminal study (1985) comparing the musical abilities of seven to nine-year-olds both reading-

disabled and non-disabled found that poor readers were significantly impaired in tonal discrimination and rhythm production, but not in rhythm perception. Lamb and Gregory (1993) discovered that five-year-old children who could manipulate and isolate phonemes had greater success in early literacy skills, and those children who scored high on pitch discrimination did significantly better on tests of phonemic awareness and reading performance. Holliman, Wood, and Sheehy (2010) show that sensitivity to speech rhythm (prosodic sensitivity) in five- to eight-year-old children predicts variance in word reading and phrase fluency a year later. Anvari, Trainor, Woodside, and Levy (2002) observe that in four-year-olds, musical discrimination skills, both pitch and rhythm, have significant correlation with phonemic awareness and reading ability, as Rubinson (2010) found with kindergarteners and Forgeard et al. (2008) with six- to ten-year-olds.

These findings seem to beg the question of whether interventions to strengthen a child's musical discrimination skill in pulse and pitch might also then, in turn, improve literacy skills, including phonemic and phonological awareness in emergent readers, and in fluency and comprehension in older readers. My sincere hope is that through this dissertation study and the discussions that will henceforth be held, practical activities through music and the knowledge of the possibilities of music to assist in the interventions of struggling readers will add to the body of educational knowledge and resources that prove helpful in unlocking the mystery of reading success for some of our most needy students.

Statement of the Problem

Speaking is a normal, genetically-hardwired capability; reading is not. No areas of the brain are specialized for reading, and reading is the most difficult task asked of a

young brain (Sousa, 2005). Speech and visual perception appear early and universally in child development, but learning to read involves an alphabetic orthography, letters and symbols, that lack evolutionary basis and as a recent cultural invention may explain why reading does not come naturally.

The fact that the brain is not ‘wired’ for reading partly explains why reading does not come ‘naturally’ like speech or visual perception which both appear very early and universally in child development. This cultural ‘imposition’ on the brain makes learning to read an alphabetic orthography a challenge not only for young children but also for scientists seeking to understand what is surely one of the most complex human accomplishments. (Breznitz & Share, 2002, p. 1)

Moreover, children who are poor readers in their early years generally remain poor readers in their later years (Sousa, 2005; Wolf & Bowers, 1999).

Learning to read fluently calls upon internal timing systems within the brain. Humans have developed timing systems associated with different behaviors and brain structures, among them the millisecond timing system, which is involved in speech, music and motor control, and involves the brain structures of the cerebellum, basal ganglia, and the dorsolateral prefrontal cortex (Taub, McGrew, & Keith, 2007). This system is what I shall call *internal pulse* or *internal rhythmicity*, and what I hypothesize is missing or deficient in children who struggle to read. Mental interval timekeeping and temporal processing research has suggested that a “higher mental clock rate” or internal pulse enables individuals to perform specific sequences of mental operations faster and reduces the probability of interfering incidents. Taub et al. (2007) present promising

research in the connections between music and reading ability, specifically in the effects of timing/rhythmicity training on students' reading achievement. They report:

The automatization of critical early reading skills, phonics, phonological awareness skills, and RAN [rapid automatic naming] performance, which emerge primarily during the early school grades are the specific areas where the elementary-aged experimental participants demonstrated the most significant improvements. (2007, p. 861)

Experience with music at a young age can “fine tune” the brain’s auditory system and gives weight to the idea that musical training helps to make brain connections that are essential in hearing and understanding language (Wong, Skoe, Russo, Dees, & Kraus, 2007). Current research and fMRI data reveal a new way of defining the relationship between the brainstem—a lower order brain structure thought to be unchangeable and uninvolved in complex processing—and the neocortex, a higher order brain structure associated with music, language, and other complex processing. The relationship between the two is dynamic and reciprocal, and our sensory circuitry is more malleable than previously thought (Koelsch et al., 2002). A study by Hyde et al. (2009) illustrates structural changes in the brain after only 15 months of musical training, keyboard lessons, in six-year-old children. The observed changes were correlated with improvements in musically relevant motor and auditory skills. Accordingly, use of pitch and tempo in daily sessions with dyslexic readers shows promise for training the brain to respond more like a typical reader’s when processing fast-changing sounds, thus improving reading (Newton, 2007).

Purpose of the Study

The purpose of this dissertation study is to examine the relationship between student mastery of pulse or beat competency and student mastery of pitch matching to student mastery of reading skills, including fluency, and to determine if a treatment period of 12 weeks of pulse and pitch activities will improve both musical and reading skills. With an established correlation and documented gains, efforts can be made to include pulse and pitch activities as a viable alternative intervention strategy for struggling readers delivered by the classroom teachers, reading specialists, and Title I professionals as well as elementary general music specialists.

Significance of the Study

Over and over, statistics bear out the importance of learning to read and the ramifications of struggling with learning to read. Over half of the men and women in prison in the United States are illiterate (Barr & Parrett, 2003); students who do not read well by the end of the third grade struggle with schoolwork and homework, which may, in turn, lead to failure in classes and ultimately dropping out (Sousa, 2005). Some states project the number of prison beds needed in 10 years by the number of third grade students who cannot read (Lewis, 2007). These are unacceptable statistics to educators, parents, and community members, those who care deeply about the children who are the faces of these numbers. If a correlation is established between the musical skills of pulse and pitch and reading ability, then further exploration into developing activities with these musical skills into valuable alternative interventions or remediation for struggling readers is warranted.

Definition of Terms

For the purpose of this study, the following operational definitions will be used:

Beat competency—will be used interchangeably with internal rhythmicity and is the ability of an individual to accurately identify aurally the underlying pulse in a musical selection or a language-based activity and match that pulse through the physical task of clapping, tapping, or walking to it (Weikart, 1982).

Basal Ganglia—two groups of cerebral nuclei, one in each hemisphere, which play a role in the control of movement (Pinel & Edwards, 2008). These are important subcortical centers associated with interval timing (Buhusi & Meck, 2005).

Cerebellum—the portion of the brain in the back of the brain between the cerebrum and the brain stem, which has a primary function of coordination of movement (Pinel & Edwards, 2008). It is not essential for interval timing but required for correct millisecond timing (Buhusi & Meck, 2005).

CWPM – correct words per minute; used in reading fluency scores.

Dorsolateral Prefrontal Cortex—the cortical area that provides a mental representation of objects to which the subject is going to respond; it initiates voluntary movements (Pinel & Edwards, 2008). This area is responsible for motor planning, organization, and regulation (Buhusi & Meck, 2005).

Dyslexia—a disorder in children who, despite conventional classroom experience, fail to attain the language skills of reading, writing, and spelling commensurate with their intellectual abilities (Overy, 2000).

Fluency—(1) accuracy and ease of decoding (automaticity); (2) age or grade-level appropriate reading speed or rate; (3) appropriate use of volume, pitch, juncture, and stress (prosodic features) in one’s voice; and (4) appropriate text phrasing or “chunking” (Reutzel & Cooter, 2008).

Interactive Metronome (IM)—a brain-based rehabilitation assessment and training program developed to directly improve the processing abilities that affect attention, motor planning, and sequencing. Study participants are instructed to synchronize hand clapping to a reference tone heard through headphones. The subject attempts to match the rhythmic beat with hand clapping while wearing an IM glove with palm trigger. The difference between the subject’s performance and the computer generated beat is measured in milliseconds. The score provided indicates timing accuracy (Interactive Metronome Certification Course, 2008).

Intervallic—the distance between two tones (Levitin, 2006).

Locomotor—movement of the body through space (Weikart, 1982).

Matching pitch—the accuracy of an individual in vocally reproducing the same sound frequency that has been presented to them by another vocal model.

Millisecond Timing System—timing system crucial for motor control, speech generation and recognition, playing music, and dancing. Perception, estimation, and discrimination of durations are in the sub-second range (Buhusi & Meck, 2005).

Non-locomotor—movement of the body in place (Weikart, 1982).

Patsch—the rhythmic patting of the lap with both hands bilaterally (Weikart, 1982).

Prosody—measured only through observation of an oral reading and refers to the reader’s inflection, expression, and phrase boundaries (Hudson, Lane, & Pullen, 2005).

Rise time—the detection of the perceptual center of an acoustic signal, associated in speech with rapid increases of midband spectral energy, typically occurring around the onset of a vowel (Goswami et al., 2002).

Rapid automatized naming (RAN)—a task that measures the speed with which children can verbally name a serial array of the most basic visual symbols (Wolf, Bowers, & Biddle, 2000).

CHAPTER TWO: REVIEW OF LITERATURE

Introduction

The following literature review will discuss existing research about music and literacy relevant to this study. The review will examine research in obstacles to fluent reading, including deficits in phonological awareness and rapid automatic naming (RAN) speed individually, and the co-occurrence of both in reading disabled students of various age groups. The connections between developing literacy skills and developing musical skills will be discussed as well as the hypothesis that training in music may benefit other skills.

Obstacles to Fluent Reading

Phonological Awareness

Bradley and Bryant's (1983) study found children need to recognize that a spoken word is made up of particular sounds that correspond to a particular letter or letters. They conducted a longitudinal study in which four and five year-olds had to listen to three or four short words, all but one of which had either the initial, middle, or end sound in common. Students then had to detect the odd word out. Their scores on this test of phonemic discrimination significantly predicted reading and spelling performance three or four years later.

Ball and Blachman (1991) demonstrated teaching kindergarteners letter-sound correspondences without also teaching phoneme awareness skills is ineffective in word recognition. Ninety students from three urban public schools were randomly assigned to one of three groups. The phoneme awareness group received training in segmenting words into phonemes and in the correspondence between letter names and letter sounds. The language activities group received training only in letter names and letter sounds. The control group did not receive instructional interventions. Using segmentation activities that draw the children's attention to the internal structure of spoken words with explicit phoneme awareness instruction significantly improved the early reading and spelling skills of the children in the phoneme awareness group.

Lamb and Gregory (1993) confirmed this relation between phonemic awareness and reading ability with a study of 18 four and five year-old children. Phonemic awareness was determined by a simple reading test, one adapted from the Thomas Coram Research Unit, comprised of four subtests: 1) Concepts about print; 2) Word matching; 3) Letter sounding; and 4) Word reading. Additional phonics skills were tested, using consonant blends and nonsense syllables. The study also investigated the relationship of musical sound discrimination to reading ability and, additionally, showed that four and five year-old subjects who achieved high scores on phonemic awareness also did well on pitch discrimination, determined by responding whether a pair of musical notes or chords sounded the 'same' or 'different.'

Goswami's (2002) theoretical overview of the role of phonological awareness in reading development and developmental dyslexia across languages proffers the primary deficit in developmental dyslexia in all languages lies in representing speech sounds, or

phonological representation, beginning with an awareness of syllables, followed by onset (beginning sound) and rime (vowel sound followed by a consonant), and eventually an awareness of the phoneme or the smallest unit of speech. Furthermore, she analyzes grapheme/phoneme recoding abilities of first graders in 14 European languages by examining matched sets of simple real words and non-words given to children during their first year of learning to read. She found the children who were acquiring reading in orthographically consistent languages, Greek, Finnish, and German, were most accurate (98%); and, those faced with reading orthographically inconsistent languages such as English were much less accurate (34%).

Wolf et al. (2002) sampled 144 severely reading-impaired children in second and third grade on the Kaufman Brief Intelligence Test, which assesses vocabulary and non-verbal concept formation; Rapid Automatized Naming Test-Letters, which involves the rapid naming of high frequency, lower case letters (a, d, o, s, p); the Comprehensive Test of Phonological Processing-Elision and Blending Phonemes and Words, which involves deleting a phoneme and blending isolated syllables or phonemes together; the Woodcock Reading Mastery Test-Revised, which assesses a child's ability to apply grapheme-phoneme rules and word analysis skills to the pronunciation of unfamiliar printed non-words, and to supply a missing word in a sentence; and the Wide Range Achievement Test, Third Edition-Reading, which measures the ability to recognize and name letters and pronounce words within a ten-second time limit. A correlational analysis revealed significant relationships between phoneme blending, deletion, and a naming speed task. Results also indicated that 60% of the students had both phonological and naming speed deficits and were the most impaired across all categories of reading performance.

Shankweiler and Fowler (2004) examine recurring questions about the role of phonology in reading acquisition in their extensive discussion of available research into the relevance of phoneme awareness instruction. Their related conclusions include: 1) Phonemic awareness is not overrated because it enables the learner to penetrate the code that relates speech to print; 2) Phonemic awareness is necessary and will rarely develop spontaneously, therefore, instruction must be available to all beginning readers; 3) Most, though not all, young children who lack phonemic awareness can gain it with instruction and make normal progress in learning to read; 4) The English language requires teaching spelling patterns explicitly; 5) A large sight word vocabulary cannot fully compensate for poor decoding skills. Word chunking such as onset and rime may be helpful, but cannot replace phoneme-level analysis; 6) Although problems with phonemic awareness are a cause of reading disability, they are only one manifestation of a broader deficit in processing phonological information. Other deficits are shown through genetic patterns and patterns of brain activity.

Summary

Phonological awareness is the understanding that language can be subdivided into smaller units of sound and manipulated (Ball & Blachman, 1991; Shankweiler & Fowler, 2004). An awareness of syllables followed by onset (beginning sound) and rime (vowel sound followed by a consonant) and eventually an awareness of the phoneme or the smallest unit of speech are manipulations that comprise phonological awareness (Goswami, 2002). Children who have difficulty on tests of phonological awareness prior to formal schooling are at risk of becoming poor readers while those who do well are likely to become stronger readers (Bradley & Bryant, 1983; Lamb & Gregory, 1993;

Wolf et al., 2002). The ability to pull apart, blend, and manipulate phonemes constitutes the most sophisticated skills in phonological processing; and, a child's ability to isolate and manipulate the sounds of language are of critical importance to their ability to learn the grapheme-phoneme correspondence rules that are necessary for decoding, fluency, and comprehension.

Rapid Automatic Naming Speed/Double Deficit Theory

Recently, it has been suggested that phonological deficits are a symptom of fundamental difficulties with processing basic sensory information entering the nervous system in rapid succession. Tallal, Miller, and Fitch (1993) discovered that children with language impairments found it difficult to determine the order of two pitched tones when the time interval between the tones was shorter than 350 milliseconds, whereas the control group of readers could distinguish the order with time intervals of less than 30 milliseconds. The researchers argue that this temporal processing speed deficit could underlie phonological difficulties such as distinguishing ba from da as this requires discrimination of differences on the order of 30 milliseconds in the speech train.

Obregon (1994) designed a computer program to digitize the speech stream of children during RAN tasks. Comparisons are made between younger average readers who read at the same level as older dyslexic children. No differences were found in the time it takes to articulate verbal labels, or for the time to scan from the end of one line to the beginning of the next line for average readers. However, significant differences were found for children with dyslexia in interstimulus intervals (ISI). This is the time it takes dyslexic readers to disengage from a previous stimulus, perceive and recognize a present

stimulus, activate lexical access and use retrieval processes for its verbal label, and then move on to the next stimulus.

Abrams, Nicol, Zecker, and Kraus (2009) examined the relationship between reading and phonological abilities and measures of envelope processing in the cortex. They collected neurophysiologic responses of 12 year-olds of varying reading abilities to sentence stimuli in three different modes of speech: conversational, clear, and compressed modes. These modes of speech have different speech envelope cues used to elicit a variety of cortical activation patterns. Compressed speech, which approximates rapidly produced speech, is characterized by more rapid speech envelope cues than conversational speech. The goal of the study was to find if the speech envelope is abnormally represented in impaired readers. Across speech modes, good readers showed consistent asymmetry in auditory cortex for all three measures of speech envelope representation. Poor readers showed a variety of response patterns differing from good readers, and in cortical response timing, poor readers' delays were seen across all speech conditions.

Wolf et al. (2000), in their extensive examination of cross-sectional, longitudinal, and cross-linguistic research on naming speed processes, timing processes and reading, reach the following conclusions: 1) Naming-speed deficits are consistently found along with phonological awareness deficits in children across all languages; 2) Naming-speed and phonological deficits can occur independently, however, the co-occurrence of both deficits characterizes the most difficult forms of reading disability, resulting in readers who are approximately 2.5 to 3 years below grade-level expectations; 3) For severely disabled readers, naming-speed appears to be a powerful predictor of later reading ability,

well into the eighth grade; 4) A breakdown within a precise timing mechanism could help to explain timing deficits among disabled readers and one possible source of the connections between naming speed and reading difficulties.

Similarly, Lovett, Steinbach, and Frijters (2000) address the perspective of the double deficit theory. In their study of 166 children ages seven to 13 with average intelligence but developmental reading disability, they examined measures of letter-sound knowledge, word identification skills, non-word reading, standardized achievement tests, speech-based phonological processing, and the Rapid Automatized Naming (RAN) text. Of the participants, 33 children displayed only visual naming-speed deficits, 31 children displayed only phonological awareness deficits, but 76 children displayed both, or the double deficit of phonological and naming-speed deficits. Children identified with a double deficit consistently performed at the lowest level of reading development, which was the most striking finding from the comparison of the three groups.

Summary

Recently, it has been suggested that phonological deficits are a symptom of fundamental difficulties with processing basic sensory information entering the nervous system in rapid succession (Tallal et al., 1993). Poor readers show a variety of response patterns differing from good readers, and in cortical response timing, poor readers' delays are seen across all speech conditions (Abrams et al., 2009). Naming-speed or the ability to quickly and accurately recognize and retrieve visually presented stimuli (e.g., letters, numbers, colors, or objects) manifests itself in struggling readers in significant problems on timed readings, fluency measures, and reading comprehension, and appears as the dominant diagnostic indicator for at-risk readers across all languages (Wolf et al., 2000).

Phonological deficits or naming-speed deficits occur independently in cases of modest to serious reading disabilities. However, the co-occurrence of both deficits, the double deficit, in combination characterizes the most severe forms of reading disability, depressing all aspects of written language acquisition for affected children (Lovett et al., 2000; Wolf et al., 2000).

Connections Between Music and Reading

Music in the Classroom

Current research points to positive connections between learning music and learning to hear, understanding the spoken word, and ultimately reading the printed word. Gromko (2005) demonstrated music instruction that teaches children to analyze simple songs into patterns enhances their ability to segment words into phonemes. Her study was conducted with two groups of kindergarten students enrolled in two elementary schools. The treatment school students received weekly music instruction for 30 minutes from advanced music methods students, whereas the control group received no music instruction. Lessons included singing simple folk songs, accompanying singing with simple body percussion (clap, pat, stamp) or rhythm instruments (rhythm sticks, shaker eggs, triangles, hand drums), and touching listening maps, or graphic charts, along with recorded music. All these activities are quite typical of a kindergarten general music curriculum. The treatment group had significantly higher gains in phoneme-segmentation fluency, an aural skill, than their peers who had no weekly music.

Fisher (2001) echoed these findings. His research conducted in an urban school district with a 100% free and reduced lunch population and a high number of students in

bilingual education programs, included four classroom teachers; two teachers used music as instructional material during the literacy block and two did not. All four teachers planned together and aligned their curriculum so that they were teaching the same thematic material at the same time. He found that student performance on the Yopp-Singer Test of Phonemic Segmentation improved based on the use of music in the regular classroom. In terms of the students' oral language development, students with experience in music averaged 13.2 on Student Oral Language Observation Matrix (SOLOM) compared with 8.4 for students not exposed to music. On the Developmental Reading Assessment (DRA), 10 students in the music-rich classroom read at grade level in English and Spanish; whereas, only one student in the non-music classroom read at grade level in English and Spanish. The use of music in the classroom included opening songs of the day, word lists, and "mystery" words generated from song titles, listening stations with songs/books that match the words and continued on the playground where these students were observed singing songs from the books that they had read.

Summary

Gromko (2005) demonstrated music instruction enhances children's ability to segment words into phonemes. Fisher (2001) found that phonemic segmentation improved based on the use of music in the regular classroom and that students with experience in music averaged higher scores on an oral language development assessment over students not exposed to music.

Sound to Symbol in Music and Print

Researchers continue to explore the connections between language skills and music, hypothesizing that training in music may benefit other skills. Anvari et al., (2002) assessed 100 four and five year-olds in the reading skills of phonemic awareness (rhyme generation, blending, and identifying different sounds), vocabulary, and letter and simple word identification, and the musical skills of same/different melody, rhythm, and chord discrimination, and simple rhythm reproduction. The results of the study indicate that music perception skills are related to phonological awareness and early reading development, suggesting that phonological awareness and music perception share some of the same auditory mechanisms. Phonological awareness requires the child to segment speech into component sounds and to recognize those sounds across variations in pitch, tempo, speaker, and context. Furthermore, musical skill was predictive of reading skill.

Forgeard et al. (2008), who conducted a longitudinal study with average reading children and those with dyslexia (mean age at baseline – 6.52 years), found a strong relationship between musical discrimination abilities and language-related skills. Measures used to determine abilities included: for reading skills, a phonemic awareness assessment, the Auditory Analysis Test; and for musical skills, the Gordon's Primary Measures of Music Audiation (PMMA) and a researcher-designed aural discrimination task that was similar to the PMMA. The researcher-designed task used stimuli identical in duration and an actual musical instrument to produce the tones rather than sine-wave tones, which is the sound stimulus in the PMMA. In both measures, children listened to 40 pairs of tone sequences and 40 pairs of rhythms and decided whether they were the same or different. In both average readers and dyslexic readers, musical discrimination

predicted phonological and reading skills. Results also suggest that children with dyslexia appear to have deficits in both rhythm and pitch processing as they consistently scored below average on both the PMMA and the researcher's melodic/rhythmic discrimination task. Furthermore, average-reading children with musical training surpassed both average readers and dyslexics in melodic discrimination. Findings suggest musical interventions aimed at improving both pitch and rhythm auditory processing may be helpful in remediating some of the language-based and neural correlates of developmental dyslexia, and may help children with learning disabilities recover normal language and music skills.

Thomson and Goswami (2008) explored the hypothesis that there is a developmental connection between auditory rhythmic timing, accurate motor tapping, and literacy because the perception and production of structured rhythmic and temporal patterns is crucial to language acquisition. Their study included 48 10 year-old children, 25 of whom were designated reading impaired, and 23 who were typical developing readers. The researchers measured rhythmic finger tapping, paced to a steady metronome beat and unpaced, motor dexterity, phonological and auditory processing. When speaking to a rhythm or perceiving the rhythm in language, the rate of change of the rise time, the amplitude envelope at the onset, is a critical auditory cue in addition to the duration of the sounds. In this study, the children with developmental dyslexia were impaired in both rise time and duration discrimination. Significant differences for both auditory and rhythmic timing skills were found equivalent to the children's development of written language skills. There were no differences in unpaced tapping or in motor dexterity between the children in the study. Findings suggest a specific difficulty for

reading-impaired children in synchronizing their finger tapping to an external auditory rhythm.

Hyde et al. (2009) demonstrated regional structural brain plasticity in the developing brains of 6 year-olds that occurred with 15 months of keyboard training. Working with two groups of children who had no prior formal musical training, the instrumental group received weekly half-hour private keyboard lessons for a period of 15 months, while the control group did not receive any musical training. Behavioral tests examined included a four-finger motor sequencing task on the keyboard and an auditory musical discrimination test where pairs of melodic and rhythmic patterns were determined as the same or different. Results were then compared with anatomical MRI scans. Structural brain changes in the motor and auditory areas, those of critical importance for instrumental musical training, were correlated with improvements on motor and auditory musical discrimination tests, and diverge from typical brain development. Findings suggest that long-term musical intervention programs can facilitate neuroplasticity in children with developmental disorders.

Rubinson (2010) examines the correlations between music aptitude and phonemic awareness in her study of 80 kindergarten children. She uses Gordon's Primary Measures of Music Audiation (PMMA) to determine tonal, rhythmic, and overall developmental musical aptitude and the Dynamic Indicators of Basic Early Literacy Skills to assess phonemic awareness (phonemic segmentation fluency, or PSI), alphabetic understanding (letter naming fluency, or LNF), and fluency with code (initial sound fluency, or ISI). The results of the study confirm that musical aptitude is significantly

correlated to phonological awareness and early reading development: LNF, $p=.031$, ISF, $p=.002$, and PSF, $p=.009$

Learning to read music notation involves many of the same processes as learning to read words: knowledge of print, words proceeding from left to right, visual symbols mapping on to specific sounds, and recognizing visual patterns. Moreno, Friesen, and Bialystok (2011) investigated whether musical training fosters children's pre-literacy skills. Sixty children between the ages of 4 and 6 participated in a summer camp emphasizing music and art training. Over a period of four weeks, the children participated in two one-hour computerized sessions that included training in rhythm, melody, pitch, voice, and basic musical text concepts, such as the musical staff, and training in visual art concepts such as light, color, line, perspective, material, and texture. Assessment measures included a vocabulary test, a phonological awareness-rhyming test, and the Visual-Auditory Learning test, which assesses the child's ability to associate unfamiliar visual symbols from a rebus with familiar words from the child's vocabulary. In this assessment, the children were initially taught arbitrary mappings between unfamiliar visual symbols and known words. Subsequently, they were shown a series of these symbols and asked to identify the symbols by using the associated words. After 20 days of training, both the visual art and the music groups exhibited improvement in rhyme awareness and the ability to map unfamiliar symbols to known words, however, the musically trained group improved significantly more than the art-trained group.

Summary

Researchers have hypothesized that training in music may benefit skills in other domains (Forgeard et al., 2008; Gromko, 2005; Hyde et al., 2009; Rubinson, 2010;

Thomson & Goswami, 2008). *Near transfer* occurs when training in one skill leads to improvements in a highly associated skill such as when music lessons train auditory abilities associated with those needed for decoding words (Moreno et al., 2011).

Learning to read music notation involves many of the same processes as learning to read words: knowledge of print is words proceeding from left to right, visual symbols mapping on to specific sounds, and recognizing visual patterns (Moreno et al., 2011).

Phonological awareness is necessary for learning grapheme-phoneme mappings (Bradley & Bryant, 1983; Goswami, 1990) and underlies word decoding (Anvari et al., 2002). This is parallel to learning notation—or mapping the symbol (note) that represents the sound in music. Training in the musical aspects of pulse, pitch, and notation with a group of 4-6 year olds displayed significant improvement on visual-auditory learning measures over a comparable group of students receiving visual art training (Moreno et al., 2011).

Pulse, Pitch, and the Struggling Reader

Building on the work of Tallal et al. (1993), Overy (2000) questioned whether a musical training program might be useful for dyslexic children in improving language and reading skills. In order to address her questions, she examined over the course of one year a group of 28 primary school students between the ages of six and eight whose teacher used music in the classroom; singing, chanting, clapping, and percussion games where basic timing, or beat competency, were practiced and gradually developed into more complex rhythmic activities. At the beginning of the school year, the children were screened for dyslexia using the Dyslexia Screening Test, pretested on the Wechsler Objective Reading Dimensions (W.O.R.D.) reading and spelling tests and the Musical

Aptitude Profile. The results indicated that the children with a strong risk of dyslexia were significantly worse at rhythm perception, or detecting whether two rhythms were the same or different, but *not* at melody perception, or detecting whether two melodies were the same or different. The strong risk students were also significantly worse at tempo perception, detecting whether a second tempo was slower or faster than a previous one. There were additional significant difficulties for them in tasks involving rapid temporal processing such as identifying how many notes had been played in a short time period and determining whether the timbres of two musical sounds were the same or different. Posttests were conducted at the end of the school year, and improvements in reading, spelling, and music skills were measured. In examining the effects of music training on language and literacy skills, posttests were conducted at the end of the school year and improvements in reading, spelling, and music skills were measured. Results showed significant improvements in phonological skills with the greatest improvements made in the group with a strong risk of dyslexia.

Dyslexic children have difficulty reading, confusing syllables and letters, because their brains process the fast-changing sounds as if they are slow-changing sounds, thus using the incorrect, slower intensity area of the brain. Unable to analyze the fast-changing sounds, their sound map may become confused. In Newton's (2007) study, dyslexic children completed exercises in a computer program known as FastForWord Language (Scientific Learning, Oakland, CA). The exercises involved no reading—only listening to sounds, starting with simple chirps that changed pitch from low to high. Children had to respond, indicating whether the pitch went up or down. Sounds were played slowly at first but gradually sped up, becoming more challenging. The sounds

became more complex: syllables, words, and finally sentences. After 60 hours of daily sessions, the brains responded more like typical readers' when processing fast-changing sounds and reading improved. Newton contended that some day clinicians may have the ability to diagnose dyslexia before reading begins, and suggests musical training as a way of treating it.

David, Wade-Woolley, Kirby, and Smithrim (2007) questioned whether rhythm (beat competency) would uniquely predict young children's reading development beyond the contribution of the more traditional variables of phonological awareness and naming speed. They assessed 53 children as they began first grade on phonological awareness, including sound oddity, blending phonemes, blending onset and rime, phoneme elision, and sound isolation. They also examined naming speed, reading ability (word identification and word attack), and rhythm using Weikart's Rhythmic Competency Analysis, which measures the child's ability to reproduce a steady beat, or pulse, in five different ways: patting the beat with both hands on the lap, patting the beat with alternating hands on the lap, moving the feet to the beat while seated, walking in place to the beat, and finally, walking to the beat through space. The children were tested again in the fall of grades 2 through 5. The correlations indicated that rhythm in first grade is significantly related to phonological awareness, naming speed, and reading ability in the same year and up to four years later. Additionally, once shared variance with phonological awareness was removed, rhythm uniquely predicted word attack in grade five. The relationship of rhythm to word reading strengthens over time, perhaps given the importance of speech rhythm in stress-timed oral languages such as English.

Summary

Research that intertwines the musical elements of pitch, pulse, and tempo with struggling readers is found in the body of research on dyslexia. Several current theories on the underlying cause of dyslexia point to a neurological timing problem or temporal processing difficulty (Overy, 2000). Dyslexic readers confuse syllables and letters when they read because they process the fast-changing sounds as if they are slow-changing sounds, using the incorrect, slower intensity area of the brain. As they cannot analyze the fast-changing sounds, their “sound map” may become confused. Linking normal letters to confused sounds may lead to syllable-confused reading (Newton, 2007). Rhythm is significantly correlated to phonological awareness, naming speed, and reading ability in first grade and for up to four years later. Rhythm production, or beat competency, uniquely predicts word attack in fifth grade (David et al., 2007).

Internal Rhythmicity

Goswami et al. (2002) examined 101 children, 24 of whom had a diagnosis of dyslexia, and 28 who were participating in a longitudinal study of precocious readers. The precocious readers had been followed from four years of age and were 11 at the time of the testing. The treatment participants were presented with auditory processing tasks and phonological processing tasks. The auditory processing tasks included a beat perception task and a non-speech same/different trial where the subjects were presented with two vowel-like tones (low-low, low-high, high-low, and high-high) and asked to respond by indicating if the tones were “same” or “different.” The phonological processing tasks included listening to a set of three words and selecting the non-rhyming word (ie., gap, nap, *Jack*); listening to three sets of non-words and repeating them (loff,

bup, heg); and the RAN task of naming familiar pictures and letters under timed conditions. The researchers determined the dyslexic participants were less able to detect beats in sounds with a strong rhythm, but the precocious readers were much better than most at spotting rhythms. The poor readers found it difficult to identify which words rhymed and which did not, a skill that requires identifying the onset of the vowel, for example, the difference between “fit” and “fat.” Dyslexic children were relatively insensitive to the amplitude-based cues, the perceptual centers (P centers) in acoustic signals, while precocious readers were exceptionally good at detecting the P centers. The P centers were the perceptual moments of occurrence in speech and musical sounds. Furthermore, a correlation was established between the ability to track amplitude changes and the ability to read and write in the non-impaired readers, leading the researchers to believe that an awareness of beat can influence the way young children assimilate speech patterns, which may in turn affect their reading and writing.

Wolff (2002) conducted a finger tapping experiment with 12 dyslexic students, 10-16 year olds, who were enrolled in remedial education for severely impaired readers. All had normal or above average intelligence. A control group of age and gender-matched average readers were enlisted from a local public school. Participants were asked to tap in time to a metronome signal by using their preferred right finger or both index fingers responding in unison. The metronome rate changed in the middle of the trial, getting faster, before returning to the initial tempo. Participants were also asked to reproduce a simple rhythmic pattern by tapping with the preferred index finger. A second experiment was conducted to determine if the finger tapping task scores might correlate with scores on a simple motor speech repetition task. Participants were asked to

repeat 2, 3, and 4 unit strings of the consonant vowel syllable /pa/ at their natural speaking rate while stressing one designated syllable in each string, ie. [PA pa] and [pa PA]; [pa pa PA], [PA pa pa], [pa PA pa]; and [pa pa pa PA], [pa pa PA pa], [pa PA pa pa], and [PA pa pa pa]. The main findings of the two experiments included: 1) The anticipation time and variability of anticipations (being too early for the pulse) were significantly greater in dyslexic participants than average readers; 2) Dyslexics took significantly longer than average readers to recalibrate their tapping after a tempo change; 3) Dyslexic participants had significantly greater difficulties in reproducing a rhythm pattern; and 4) Dyslexics had much greater difficulty than average readers when reproducing the prescribed speech rhythm and order of syllables during the repetition of 3 and 4 syllable sequences. There were no group differences in the repetitions of two-syllable speech “rhythms.” The author contended that his findings may lead the way for devising alternative approaches to assist in the remediation of reading impaired students that would not focus solely on phonological processing.

Summary

Poor readers were significantly less sensitive to changes in rise time—or the perceptual center of the syllable—than their chronological and reading-age matched peers, and precocious readers were the most sensitive of all groups to beat variation (Goswami et al., 2002). Dyslexics have difficulty with finger tapping to a steady beat, particularly when the tempo is increased or decreased during the task (Wolff, 2002).

Interactive Metronome

In a study of 585 children from three elementary schools, pre-school through fourth grade, Kuhlman and Schweinhart (1999) examined the metronome timing as assessed by the Interactive Metronome (IM) system and the musical timing as assessed by ratings of videotaped responses of the children to the steady beat of a recorded instrumental musical selection. Rhythmic tasks included patting knees with both hands, clapping hands together, patting knees with alternating hands, patting knees with preferred hand, patting knee with non-preferred hand, toe-tapping with alternating feet, and walking in place. A number of variables were also examined including gender, handedness, physical coordination/motor skill, attention in class, ability to attend over time, dance classes, instrumental music, household income, parents' highest level of schooling, age, grade, and achievement test scores for reading, language, and math. Findings indicated that older children, as might be expected, had both better metronome and musical timing than did younger children. Girls had better musical timing than boys, but no better metronome timing—meaning girls may have a more accurate ability to identify the pulse in a musical selection but cannot track beeps any better than boys. Most importantly, children's metronome and musical timing were significantly related to their percentiles on the California Achievement Test. The relationship between metronome timing and achievement scores was the strongest with consistently better means with increasing achievement test scores.

Shaffer et al. (2001) determined the effects of IM as an intervention tool for improvement in the motor and cognitive skills of a group of 56 boys, ages 9-12, diagnosed with attention-deficit/hyperactivity disorder (ADHD). The boys were

randomly assigned to one of three matched groups. Nineteen boys received 15 hours of IM rhythmicity training and were compared with a group receiving no intervention and a group receiving training on computer video games in three areas: attention and concentration; clinical functioning (Achenbach Behavior Checklist, Sensory Profile, Bruininks-Oseretsky Test for Motor Efficiency), and academic and cognitive skills. Results indicated that the boys in the group that received the IM interventions improved significantly in areas of attention, motor control, language processing, reading, and in their ability to regulate aggression over the other boys receiving either the video treatment or no treatment.

Taub et al. (2007) examined the effect of improvements from IM training, a non-academic intervention, in timing/rhythmicity on students' reading achievement. Study participants included 86 African-American first to fourth grade students from a Title I public charter school with a FRL population of 83%. Tests used to measure reading achievement pre and posttest included: selected subtests (blending non-words, segmenting non-words, rapid digit naming, rapid letter naming) of the comprehensive Test of Phonological Processing (CTOPP); Test of Silent Word Reading Fluency (TOSWRF); Test of Word Reading Efficiency (TOWRE); and the Woodcock-Johnson III Tests of Achievement (WJ-III ACH). Students were randomly assigned to either a treatment group receiving the IM interventions or a control group engaged in recess activities along with their non-participating classmates during the IM intervention times. Students in the treatment group participated in an average of 18 daily IM training sessions, each lasting approximately 50 minutes. IM treatment had a statistically significant effect on posttest timing and rhythm scores, $p < .001$, and resulted in close to a

two standard deviation increase in those scores. Training was found to be most effective for participants with poor initial timing/rhythmicity. Additionally, IM training produced significant transfer effects in phonics, phonological awareness, and reading fluency.

Summary

Three studies reflect the possibilities and implications that the IM may hold for the educational world. Kuhlman and Schweinhart (1999) found that IM scores are correlated with scores on the standardized California Achievement Test. Shaffer et al. (2001) demonstrated that ADHD students exhibited similar correlations with the Bruinks-Oseretsky Motor Proficiency subscales (coordination, upper-limb speed, and dexterity) and scores on the IM assessment. Taub et al. (2007) revealed that IM treatment had a statistically significant effect on posttest timing and rhythm scores, resulting in close to a two standard deviation increase in those scores, and produced significant transfer effects in phonics, phonological awareness, and reading fluency. These findings seem to suggest that timing and rhythmicity, steady beat, are important in motor planning and control, attention, and focus. Further exploration could ultimately lead us to examine how this training and practice in steady beat might be applicable to the classroom as an alternative intervention with students struggling to read.

Pilot Study

The researcher's own pilot study (Conlon Khan, 2009) examining the correlations between ability to match pitch and internal rhythmicity and reading fluency provided guidance and information that assisted in the development of a treatment plan, including the 12 lesson plans to be used by the cooperating general music specialists. In this 2009

study, correlations between scores on the IRI/WPM, IM assessment, levels on the pitch assessment, and the NAEP Oral Reading Fluency Scale were all found to be significant. The correlation between the IRI correct words per minute score and the NAEP Oral Fluency assessment was significant with $p = .726$; the correlation between the IRI and the Interactive Metronome (IM) score was significant with $p = -.640$; the IRI and pitch-matching correlation was significant with $p = .53$; the NAEP and IM correlation was significant with $p = -.697$; the correlation between NAEP and pitch-matching, significant at $p = .486$; and, finally, the IM and pitch-matching correlation was significant at $p = -.459$. The IRI/WPM, IM assessment, and the Pitch assessment are all the same assessments used in the current study and will be described in full later within the research design section of this dissertation.

CHAPTER THREE: METHOD

Research Questions

Based upon the work of Anvari et al. (2002), which demonstrated musical discrimination skills (both pitch and rhythm) have significant correlation with phonemic awareness and reading ability, and the research of Taub et al. (2007) where improved interval time tracking produced a statistically significant effect on student's reading achievement scores, the research questions include:

1. Will the treatment of a 12-week period of pulse and pitch activities delivered by a general music specialist help third grade students who are reading below grade level improve their reading skills along with their music skills?
2. Will the addition of 12 sessions of Interactive Metronome training, administered by a certified IM provider, for individual students in one of the study schools further improve reading and music skills beyond the rest of the students in the study?

Research Design

To answer these questions, I designed a series of 12 lessons (described below) designed to improve students' rhythm and pitch. Half of the students in the study received the lessons and the other half did not. Outcome measures were administered prior to the lessons and again at the end of the lessons. Therefore, this is a 2 (treatment versus control) x 2 (pretest versus posttest) design.

Development of Lesson Plans

A series of 12 lesson plans including activities and exercises in pitch-matching and steady beat were developed by the researcher, drawing heavily from the Orff approach of teaching music to children, which included: emphasis on speech rhythms and the connection of speech to pulse, movement of the body to a steady pulse, and the use of instruments, both simple percussion instruments and barred melody instruments such as xylophones, to replicate speech rhythm patterns or melodic phrases. The inclusion of folk dance was based upon the work of Weikart (1982), and Weikart, Schweinhart, & Lerner (1987). Practice in the aural skill of determining whether rhythmic and melodic patterns were the same or different was drawn from the Anvari et al. (2002) study of musical skills, phonological processing, and early reading ability, and the Wolff (2002) study of timing precision and rhythm in developmental dyslexia. Reproducing speech with body percussion (patsch—or patting the lap, clap, snap, stamp) and on instruments was informed by the work of Overy (2003), David et al. (2007), and Thomson and Goswami (2008). Taub et al. (2007) contributed to the conscious repetition of steady beat activities while the novel approach of reading and walking and asking students to walk to a steady external pulse provided by instrumental music while reading was inspired by the article, *Incorporating movement with fluency instruction: A motivation for struggling readers* (Peebles, 2007). All of the activities, speech and song material, instruments, and recordings are commonly included in an elementary general music program and should be familiar to a general music specialist.

Participating Schools

The study was conducted in five elementary schools of varying demographics and free and reduced lunch (FRL) populations. Three of the study schools were in the same large urban district, two of which were Title I schools; one in a neighboring district with a slightly smaller population base, also a Title I school; and one in a neighboring charter school, K-8.

Table 1
Descriptive Demographics of the Study Schools

School #	Enrollment	FRL	SPED	GATE	ELL	Daily Attend	% of HQ faculty
1	350	82.9	11.4	1.1	16	95.6	100
2	569	34.2	9.8	3.2	1.9	95.3	100
3	732	63.8	12.4	5.7	17.1	93.5	100
4	589	56.0	9.5	.07	5.25	97.0	95
5	517	n/a	5.1	n/a	n/a	96.0	100

This study began with these five elementary schools, all with a certified general music specialist who delivered the treatment lessons. However, two schools' data were removed from the study; the rationale for removing those schools from the study is as follows. School 5 had only five below-grade level readers in the third grade, and, the cooperating general music teacher providing the treatment to all students. School 4 held the treatment sessions in the morning before the school day and the attendance of their

five treatment students at the sessions was highly inconsistent. Of the five students, only one attended all 12 sessions, one 11 sessions, one 10, and two of their treatment students attended only three or fewer treatment sessions. As the fidelity of the treatment was compromised, this school was dropped from the study. Therefore, in the end, three schools' data were included in the study. Likewise, the Primary Spelling Inventory data was not analyzed because of missing data points from study participants. Only one school had a complete data set; one school collected only posttest data, and one school misplaced the complete spelling inventory folder.

Study Participants

Study participants were selected from among the regular education classes of third graders and were students who scored a 1 (below grade level) on the Fall 2010 IRI and who were among Tier 2 or Tier 3 (Intermediate or Early Fluent) English speakers. Classroom teachers determined the group of 3-6 treatment participants at each school from among the students in their respective homerooms as well as the control group, a non-random assignment. Groups were planned to evenly match numbers of students, as close as possible, in the treatment and control groups. In several cases, the classroom teacher considered the students' behaviors in assigning the control and treatment groups, assigning the more negative and/or uncooperative students to the control group. Gender of the participants was almost evenly split with 8 girls and 7 boys included among the treatment participants and 6 girls and 6 boys included in the control group.

Procedures and Measures/Assessments

The Interactive Metronome (IM), pitch-matching, and the Idaho Reading Indicator/ Words Per Minute (IRI/WPM) assessments were administered during the fall, second quarter to all third grade subjects at a time convenient for the classroom teacher. The assessments took place over the course of four weeks during the morning hours. Each student completed three data collection sessions, beginning with the fall IRI/WPM assessment. The IM and the pitch-matching assessments were administered simultaneously in random order as the students became available and as their individual classrooms were scheduled in the building IRI testing schedule. Data from the IRI was collected from the classroom teacher and the reading specialist and coded for anonymity. The researcher provided a recorded prompt for individual students' pitch matching assessments, which included a series of grade-level appropriate intervallic exercises on the neutral syllable, "la." The assessments were individually administered in a quiet space separate from the classroom. The prompts were recorded by the cooperating teacher and scored later by three qualified raters experienced in vocal music education. Cohen's Kappa for inter-rater reliability stands at .89, which is considered "very good agreement" falling between .80 to 1.00 on the Kappa scale. The same measures and procedures were used for the post-test, which took place in the spring, again over the course of a four-week period. IRB approval was secured and all requirements followed, including parental permission for participation.

The Interactive Metronome

The Interactive Metronome (IM) is a patented computer-based device that quickly and precisely measures a student's metronome timing or ability to match a movement to

the steady beat of a metronome (Cassily & Jackson, 2001). The motion-sensing hand trigger is used, which is plugged into a computer port and then strapped to the student's hand to signal when the student claps. The IM produces a recurring beep that can be set at any tempo or number of beats per minute. The objective is to clap the hands to the steady beep wherein the trigger signals the metronome program and registers the time between the metronome beep and the person's action to the nearest millisecond. A person's timing score is the difference in milliseconds between the moment of the beep and the moment of the person's tap. The computer program averages these scores across the many tapping events involved and registers a timing score. A high timing score indicates a larger average number of milliseconds between the metronome beeps and the student's movements, hence, less accurate timing. The lower the timing score, the better the timing. Task average scores range from greater than 280, classified as extremely deficient, to 40 and below, which are considered superior. An average score ranges from 90-119.

Idaho Reading Indicator/Words Per Minute Score

The Idaho Reading Indicator (IRI) is one of the statewide standard assessments in literacy given to third graders throughout the year (Boise School District, 2008). The IRI assesses fluency and accuracy (correct words per minute) of the student's reading skills. Students are assessed on their abilities to identify letters, sound out words, read sight words, spell detect, detect syllables, and read a passage and answer comprehension questions. The correct words-per-minute (cwpm) score reflects student performance as being: (1) deficient or below grade level; (2) emergent or approaching grade level; (3) established or on grade level. The fall words-per-minute cut scores for third grade are as

follows: (1) 0-81, below grade level; (2) 82-109, emergent; (3) 110 and above, on grade level. The IRI is administered individually to each student by a trained proctor other than the classroom teacher and is given in fall and spring (Boise Schools Website, 2008).

Researcher Developed Pitch Matching Assessment

The pitch-matching assessment created by the researcher included six pitch matching/intervallic third-grade-level echo singing exercises appropriate according to state and district standards (Idaho State Department of Education, Meridian School District, 2009). The students were asked to echo the adult straight-tone recorded vocal model in the following intervallic patterns: (1) the descending sol-mi minor third; (2) the descending sol-mi minor third followed by an ascending major fourth (mi-la) and again the descending sol-mi minor third; (3) three descending diatonic steps, mi-re-do; (4) three ascending diatonic steps, do-re-mi; (5) five ascending diatonic steps, do-re-mi-fa-sol; and (6) five descending diatonic steps sol-fa-mi-re-do. The student assessments were recorded and later scored by three raters experienced in vocal music education. The following six-point pitch-matching scale was used:

- | | |
|---------|---|
| Level 6 | consistent accuracy in matching both pitch and interval; |
| Level 5 | accuracy in matching the starting pitch and 80% accuracy in matching intervals; |
| Level 4 | inaccuracy in matching the starting pitch and 80% accuracy in matching the intervals; |
| Level 3 | accuracy in matching the starting pitch and less than 80% accuracy in matching intervals; |

- Level 2 inaccuracy in matching the starting pitch and less than 80% accuracy in matching the intervals;
- Level 1 consistent inaccuracy in matching both the starting pitch and the intervals.

The Primary Spelling Inventory

The general music specialist or the reading specialist in each respective building administered the Primary Spelling Inventory (PSI) to the students. The PSI consists of 26 words that begin with a simple consonant-vowel-consonant pattern and ends with inflected endings, or *ing* endings such as *clapping* or *riding*. The PSI is a reliable instrument that assesses developmental word knowledge, showing an alpha coefficient over .90 for internal consistency (Invernizzi, 2005; Johnston, 2003). Spelling inventories provide information about a student's spelling stage, knowledge of orthographic features, and reading achievement (Bear, Invernizzi, Templeton, & Johnston, 2008).

The entire list of 26 words was spoken aloud by the assessment administrator and written by the student. The researcher scored each assessment using the *Words Their Way Primary Spelling Inventory Feature Guide* (Invernizzi, Templeton, & Johnston, 2008) which employs a continuous point scale from 0 to 82. The *Emergent* stage lists points for correct initial and final consonants; the *Letter-Name Alphabetic* stage includes points for correct spelling of short vowels, consonant diagraphs and blends; the *Within Word Pattern* stage includes points for correct spelling of long vowel patterns and other vowels; and the *Syllables and Affixes* stage includes points for correct spelling of inflected endings, including *ed*, *es*, *ies*, *pping*, and *ding*. The total score is a combination of points for the correct spelling of each word as well as points for the correct use of each

feature listed. As noted above, there was a substantial amount of missing data on this measure; therefore, it was not analyzed.

Treatment Plan

All five schools were included in the musical activities treatment plan that included 12 weeks of intensive pitch and pulse training with a general music specialist. Due to the complexity of the educational setting and each school and specialist's individual daily schedules, one treatment school received 30-minute sessions twice weekly, and two schools once weekly. Each specialist attended a training session provided by the researcher to clarify lesson plans and any questions that arose from the use of such lesson plans and ensure uniformity, as much as possible, in the presentation of the activities. The researcher collected periodic qualitative reports from each specialist and monitored progress with phone calls, emails, and a visit to each school site. The complete 12 lesson plans are available in Appendix A.

Additional IM Training

Treatment subjects at one of the schools received Interactive Metronome training with a certified provider three times weekly for a period of four weeks in addition to the pulse and pitch activities with the Music Specialist. The treatment consisted of six phases. Phase 1-3 an introduction to, and the learning of, the Interactive Metronome program, included learning the reference tones, guide sounds, and developing basic timing skills with hand clapping activity repetitions between 54 and 100 over a duration of 1-5 minutes. Phases 4-6 developed generalized timing skills, hand clapping to using

the feet and crossing the mid-line, and focus skills with activity repetitions between 100 and 300 and sustained-over-time (2-10+ minutes) timing and focus skills.

CHAPTER FOUR: RESULTS

In this study, I evaluated the effect of a musical intervention designed to improve internal rhythmicity and pitch matching on reading fluency. Before examining the effect of the treatment on reading fluency, it is important to establish that there were differences between the groups in rhythmicity; therefore, I analyzed these data first.

Manipulation Check

To examine whether the treatment improved rhythmicity, I conducted a 2 x 2 (group [treatment versus control] x time [fall pretest versus spring posttest]) ANOVA. As seen in Table 3, rhythmicity scores improved for both groups. The interaction was not significant; $F(1, 24) = 2.109, p = .160, \eta^2 = .084$. The lack of an interaction suggests that the treatment did not improve rhythmicity more than one would expect it to improve naturally over time. However, the absence of an effect may be due to a lack of statistical power. When examining change across time in a planned comparison, rhythmicity improved significantly from pretest to posttest for the treatment group, $t(14) = 2.67, p = .018$, but not for the control group, $t(9) = 1.49, p = .17$. Pitch data were analyzed using a Pearson Chi Square, Value = 3.714, $df(5)$, Asymp. Sig. (2-sided) = .591.

Table 2
Comparison of Rhythmicity and IRI Fluency Scores in Control and Treatment Groups

	Means	Means
	Pre-Test (SD)	Post-Test (SD)
IM Control	138.000 (120.562)	116.100 (105.587)
IM Treatment	158.000 (138.344)	82.666 (80.193)
IRI Control	45.90 (12.844)	90.90 (24.00)
IRI Treatment	48.6 (18.4)	95.53 (32.4)

In order to give the reader a better sense of the changes in performance seen in each individual student across rhythmicity, pitch, and IRI frequency, Tables 3 and 4 are presented below. Both treatment and control groups are listed.

Table 3
Rhythmicity, Pitch, and IRI Frequency Scores - Treatment Groups

IM Fall	IM Spring	IRI Fall	IRI Spring	Pitch Fall	Pitch Sp
305	82	43	100	2	2
78	37	50	102	5	6
95	23	38	83	5	6
102	39	16	46	2	4
80	33	72	124	1	2
70	24	62	119	6	6
327	147	48	87	2	2
109	74	15	26	2	2
93	77	30	51	1	1
105	74	43	118	5	5
31	28	72	117	4	5
76	78	60	134	5	3
49	75	73	132	2	5
468	78	52	96	5	5
382	371	56	98	5	5

Table 4
Rhythmicity, Pitch, and IRI Frequency Scores - Control Groups

IM Fall	IM Spring	IRI Fall	IRI Spring	Pitch Fall	Pitch Sp
53	41	56	125	3	3
329	202	22	63	3	2
145	68	57	84	5	5
		59	72		
		68	79		
90	64	46	106	5	2
58	53	43	63	2	2
170	195	28	62	2	5
373	364	51	91	2	2
43	64	62	126	2	5
79	70	41	102		
40	40	53	87		

As seen in Table 3, all the treatment students improved their IM scores from fall to spring except for one student who stayed relatively the same (+2) and one student who did not improve (+25). Treatment students in school #1 improved their IM scores from fall to spring an average of -82. School #2 showed an average improvement of -65; and, School #3, an average improvement of -75. Control students showed less improved scores from fall to spring: School #1, with an average improvement of -72, and Schools #2, and #3 with virtually no change (+4, and +3, respectively). In reading fluency improvement, IRI scores from fall to spring increased for School #1 an average of 48 cwpm for the treatment group vs. 32 cwpm for the control group; School #2 increases were parallel with an improvement of 36 cwpm for the treatment group and 38 cwpm for the control as were the increases for School #3, 52 cwpm on average for the treatment group and 49 cwpm for the control.

Pitch ratings from fall to spring in School #1 improved in four of the students and remained the same in two. In School #2, all four students remained at the same pitch rating, and in School #3, two students improved their pitch ratings, two remained the same and one decreased. For the control groups, School #1 students remained the same ratings with one student decreasing; School #2, one student remained at the same rating, one improved and one decreased; and School #3 remained the same with one student improving.

Thus, although the treatment did not lead to changes in pitch, the planned comparison suggests that the treatment did improve rhythmicity. As rhythmicity is related to reading fluency (Conlon Khan, 2009), it was hypothesized that the change in

rhythmicity would produce a change in reading fluency. The test of this hypothesis is reported next.

The Effect of the Treatment on Reading Fluency

Reading fluency (IRI) was analyzed in a 2 x 2 (group [treatment versus control] x time [fall pretest versus spring posttest]) ANOVA. Neither main effect was significant, $F(1,24) = .023$, $p = .977$; nor was the interaction, $F(1,24) = .069$, $p = .794$. Thus, the treatment did not produce significant improvement in reading fluency. One explanation for the lack of statistical difference is the small sample size. Another explanation is that the treatment was not intensive enough to produce the desired effects.

To evaluate the latter explanation, I examined performance at School #1, which delivered the treatment with the highest frequency. In this school, four weeks of individual IM treatment sessions of 30 minutes three times a week overlapped with four weeks of pitch and pulse training by the general music specialist once per week. This resulted in the study participants receiving treatment four days a week for four weeks, much closer to the daily interventions recommended by related research. Reading fluency (IRI) scores in this school improved beyond the other two schools and beyond what would be considered ambitious for a four-week period.

Table 5
IRI Fluency Scores for Treatment Group with Additional IM Training

Participant	Test	Median	Score	Gain
<u>Student 1</u>				
4/4/11	Pre	(WRC/E)	68/2	
5/9/11	Post	(words read correct /errors)	83/3	(cwpm) + 15
<u>Student 2</u>				
3/25/11	Pre	(WRC/E)	87/4	
5/9/11	Post		100/3	(cwpm) + 13
<u>Student 3</u>				
3/25/11	Pre	(WRC/E)	95/2	
5/9/11	Post		102/3	(cwpm) + 7
<u>Student 4</u>				
3/23/11	Pre	(WRC/E)	91/3	
5/3/11	Post		119/5	(cwpm) + 28
<u>Student 5</u>				
3/25/11	Pre	(WRC/E)	98/2	
5/3/11	Post		124/4	(cwpm) + 26
<u>Student 6</u>				
3/25/11	Pre	(WRC/E)	37/10	
5/2/11	Post		46/8	(cwpm) + 9

Table 6
Realistic and Ambitious Reading Goals Based on a Normative Sample of Students Receiving Standard Instruction

Grade Level Passages	Realistic Goals	Ambitious Goals
3	1.0 cwpm per week	1.5 cwpm per week

Fuchs, Fuchs, Hamlett, Walz, & German (2003)

As can be seen in Table 5, students from the school that received the additional Interactive Metronome training made significant gains in their words read correctly (WRC) per minute scores within the four-week period than would be considered realistic (1.0 wpm per week) or even ambitious (1.5 wpm per week). According to Fuchs et al. (2003) (Table 7), the average growth in cwpm scores for third grade students is .85 to 1.5 cwpm per week or 6.0 wpm within a four-week period. During the four-week period of additional IM training, Student 4 gained 28 cwpm, a score more than four times the ambitious goal of 6 cwpm within the same time frame. Likewise, Student 5 gained 26 cwpm, another significant gain. Student 3 showed the smallest growth among the group, 7 cwpm, but also had two of the twelve 30-minute training sessions shortened by 20 minutes due to attendance issues. Students 1 and 2 gained 15 and 13 cwpm, respectively, more than doubling the ambitious weekly growth; and, Student 6 gained 9 cwpm, a huge gain and cause for celebration for the student and the Resource Room teacher who manages her IEP (Individualized Education Program) as part of the school's Special Education program.

Therefore, based on the data from School #1, the alternative reading interventions using pulse and pitch show promising results for the future if the intervention is delivered daily for a minimum period of four weeks.

CHAPTER FIVE: DISCUSSION

Findings

In reflecting upon the research questions for this study, the treatment participants as a group improved their internal rhythmicity over the course of the study period, approaching statistical significance (.160) over the control group. With a larger number of study participants, it may be assumed that statistical significance would be achieved. However, the words per minute, or fluency scores, of the treatment participants did not follow the large gains in internal rhythmicity over and above the control group. The treatment participants improved their reading fluency, doubling their words per minute scores, but gaining only two words per minute over the control group. Both the control and the treatment groups in this study were struggling readers who read below grade level, and all the students received various combinations of additional interventions within their homeroom classrooms, provided by building reading specialists, Title I tutors and paraprofessionals, and before and after school tutoring programs. It would be difficult to isolate how these various interventions contributed to the fluency scores of either group.

Frequency Variables

Frequency of the intervention seems to be a crucial variable in this study. The musical interventions provided by the general music teachers at the school sites varied widely in frequency from once a week, twice a week, every four days, and in the time of

day before school, mid-day, and the last 30 minutes of the school day. With the exception of the before-school group, this is the reality of working in a public school setting. In the current economic climate, school personnel are working with ever-increasing numbers of students, and daily schedules are less than ideal. The general music specialists who agreed to be a part of this study added additional teaching time to their already busy schedules with the intervention sessions and, although supported by their administrators, were unable to provide time for daily intervention sessions.

Reynolds, Wheldall, and Madelaine (2010) state that successful intervention programs for struggling readers in the first three years of schooling should be sessions that are frequent, preferably daily, and involve 20-30 minutes of intensive instruction. Pressley, Gaskins, and Fingeret (2006) emphasize that multidimensional reading interventions need to happen *every day* for struggling readers to become more fluent. This seems to be evidenced by the more significant gains in School #1, the school that was able to add the Interactive Metronome training three times per week in addition to the treatment lessons they were receiving.

Current Interventions for Struggling Readers

Educators generally accept that a focus on preventing learning failure is critical, but there is little agreement about the most effective and efficient way to carry out interventions for struggling readers. One reason for this is that although there are a large number of interventions available for use with beginning readers, there is, as yet, limited scientific evidence to support their efficacy (Fuchs & Fuchs, 1998). What Works Clearinghouse's (WWC) review of programs and interventions for beginning readers finds that of 153 programs reviewed by the WWC only 11 were found to have sufficient

evidence of effects in one or two of the five domains nominated as being important aspects of reading by the National Reading Panel (National Institute of Child Health and Human Development, 2000). This points to the difficulty of finding one intervention that works for all students.

Motivation

Children with lower motivation usually exhibit and sustain poor performance in reading activities (Chapman, Tunmer, & Prochnow, 2000). Student motivation plays a role in the success of the reading interventions provided to struggling readers (Melekoglu, 2011). I believe that the advantages of the pulse and pitch musical intervention lie in its attractiveness to the students who are part of the group. As a preface to my pilot study on correlations between musical skill and reading ability and the seminal ideas for this dissertation, I worked with a group of first graders to experiment with activities and materials that connect language to movement, sound to symbol, and that solidify beat competency and refine aural discrimination. Many of these activities are the basis of the 12 lesson plans created for this study's treatment group. Several of those same students are still enrolled in my elementary school; and, one boy just this year asked me, "...When will I get to come and work with you on reading again like I did in first grade?" (personal communication, December 6, 2011). This particular student is a fifth grader now. I am convinced that he recalls our activities of five years ago because he enjoyed them; they were motivating, fun, and out of the ordinary realm of reading interventions. Currently, another small group of third graders who are below grade level in reading are using the same musical intervention treatment plan. A parent

of one student shared that her daughter is excited about being in the “music” reading group and “loves coming every day” (personal communication, January 17, 2012).

Participating Teacher Observations

Upon completion of the study, the cooperating general music specialists and the study participants’ regular classroom teachers were questioned via email and/or in person to gather any anecdotal evidence of academic and personal growth in their respective students. Classroom teachers in School #1, the study site that received the extra IM sessions, reported that the interventions had made a noticeable difference for their students in academic areas and in their level of confidence in the classroom (personal communication, May, 2011). Another teacher in the same building communicated, “I don’t know what you are doing, but things are starting to click for my student in the classroom” (personal communication, March 14, 2011). Classroom teachers in Schools #2 and #3 reported that they did not see measurable differences. The general music specialists in two of the three schools reported observing growth in beat competency for all subjects, but not noticeable improvement in pitch-matching for everyone (personal communication, May, 2011). This observation reflects the intended emphasis placed on internal rhythmicity and the length of time spent on steady beat and pulse exercises throughout the treatment lesson plan series over the practice time assigned to pitch-matching and aural discrimination skills. The general music specialist in School #3 reported observing that the study participants were performing more accurately and with increased confidence in music classes during the course of the treatment lessons and that the subjects were learning songs, dances, and instrument parts much more quickly than before the study began (personal communication, May 26, 2011).

An additional observation of all three general music specialists that will contribute to the refinement of the lesson plan series was the success of the reading “walks” that were included in Lesson 11 and Lesson 12 in propelling the students forward in their reading aloud. This exercise included reading third grade level passages aloud together while seated, reading the same passage aloud together while walking around the room, and then, reading aloud together while walking around the room with the addition of instrumental music playing at an appropriate tempo. The entire exercise was repeated with the students reading the same passage in the same three ways but reading aloud individually to themselves. The music specialists observing this process were unanimous in their recalling how the exercise seemed to propel the students forward in their reading, in keeping them at a fluid, or fluent, tempo, in helping them to stumble less over the vocabulary. One could argue that this is simply a matter of repetition of the text and would happen independently of the moving and music, but the idea begs for future research in this area. For future treatment groups, more of this type of exercise and activity will be added to the lesson plans and earlier in the series.

Limitations

Limitations have been included and discussed in the applicable sections up to this point, but to reiterate, the limitations of this study include:

- Sample size – an n of 25 makes it difficult to show statistical significance.
- Non-random assignments to treatment and control groups – could not control for scheduling issues that determined assignments to groups
- Frequency of the interventions – successful interventions need to be *daily*, not once or twice a week.

- Variability of instruction – although the same lesson plans were used, different intervention providers allowed for inconsistencies in the treatment.
- Missing data points – lack of a control group at one site and attendance issues at another site limited the useable data to three schools. The Primary Spelling Inventory was not used as a measure of reading ability because of missing data points.
- The researcher's home school was one of the sites and highly invested in the study.

CHAPTER SIX: RECOMMENDATIONS FOR FURTHER RESEARCH

Advocacy for Music Education and Musical Interventions

This dissertation study not only points to the importance of future research in the connections between music and reading and the use of music in interventions for struggling readers but also to the use of music to assist in ensuring that younger children play with the sounds and the rhythms of language. The intervention activities in the 12 lesson plans, with the exception of the reading walks, are all musical activities that take place in a typical general music classroom, under the tutelage of the music specialist; speaking, singing, moving (non-locomotor and locomotor), clapping, playing to a steady pulse, and playing the rhythm of the words or melody. Music helps develop internal rhythmicity and phonemic awareness, which, in turn, helps to develop fluency and thus comprehension. It is unbelievable that even in these times of stretched budgets and shrinking dollars for education, music continues to be cut from the elementary school curriculum. Experience with music at a young age benefits all children, whether musically exceptional or not, in learning to read (Wong et al., 2007).

Frequency of Musical Interventions

The question of frequency in musical interventions, as in any reading intervention, is an important area that calls for further research. A *daily* intervention plan that includes pulse and pitch activities, more frequent reading walks, and Interactive Metronome training sessions, could prove to be an alternative intervention program that

results in significant gains. Review or short follow-up treatment periods placed from one month after the completion of the initial intervention through additional months as deemed necessary could help to sustain those gains.

Musical Intervention Design

Further experimentation with various additional or alternative pulse and pitch activities used in the interventions is also warranted. Beat competency should remain at the forefront of any musical interventions used to improve reading fluency, but the nuances of pitch and rhythm recognition and exploration could be modified from group to group as necessary. The addition of the Interactive Metronome training is recommended, but as the Interactive Metronome has initial set up costs that may be prohibitive in some cases, studies that include the IM training as part of the daily interventions and those that do not would be valuable as a comparison.

Follow-Up Study

In a follow-up study by the researcher, six third graders below grade level in their reading abilities met daily for 30 minutes for musical interventions based on the same 12 lesson plans included in this dissertation study. The interventions were held within the school day at a time when other students were being pulled out for Title I and Special Education services. The interventions lasted for four weeks, totaling 20 sessions with the researcher. Table 7 shows the students improved their fluency by +24 cwpm, +15 cwpm, +9 cwpm, +6 cwpm, +3 cwpm, with one student showing no growth. As reported earlier, according to Fuchs et al. (2003) (see Table 7), the average realistic growth in cwpm scores for third grade students is .85 to 1.0 cwpm per week, with a growth of 1.5 cwpm

per week or 6.0 wpm within a four-week period considered ambitious. Results are promising and somewhat comparable to the dissertation study group that received the IM training sessions three times a week overlapping with the musical interventions: +28 cwpm, +26 cwpm, +15 cwpm, +13 cwpm, +9 cwpm, +7 cwpm.

Table 7
IRI Fluency Scores for Follow-Up Study

Participant	Test	Median	Score	Gain
<u>Student 1</u>				
1/4/12	Pre	(WRC)	71	
2/2/12	Post	(words read correct)	95	(cwpm) + 24
<u>Student 2</u>				
1/4/12	Pre	(WRC)	62	
2/2/12	Post		59	(cwpm) + 0
<u>Student 3</u>				
1/4/12	Pre	(WRC)	85	
2/2/12	Post		91	(cwpm) + 6
<u>Student 4</u>				
1/4/12	Pre	(WRC)	93	
2/2/12	Post		96	(cwpm) + 3
<u>Student 5</u>				
1/4/12	Pre	(WRC)	106	
2/2/12	Post		115	(cwpm) + 9
<u>Student 6</u>				
1/4/12	Pre	(WRC)	110	
2/2/12	Post		125	(cwpm) + 15

In addition to gains made on the IRI fluency measure, gross motor improvements made during the course of the musical interventions observed by the researcher include: improvements in crossing the mid-line when playing melodic patterns on the xylophones; improvements in alternating hands while drumming rhythm patterns; improvements in moving to a steady pulse more accurately; and improvements in being able to match the rhythm of speech in spoken language to the rhythm reproduced by the hands in playing an instrument or the feet in moving through space.

This current study resulted in trends toward statistical significance, but to achieve significance it will be necessary to increase the number of participants in each group and the number of study groups involved. Several other research questions and studies could provide additional knowledge to include in the body of work on the relationships of music and reading: 1) exploring interventions aimed at pre-school and early kindergarten students to prevent reading difficulties later on; 2) comparing two and three year olds with lack of beat competency who receive musical interventions to those who do not receive musical interventions, and their subsequent phonological awareness and rapid automatic naming abilities in kindergarten and first grade; 3) examining the transition of poor readers in third grade where students are “learning to read” to fourth grade where students are “reading to learn.”

As well, it may prove beneficial to conduct studies with the Interactive Metronome as the sole intervention activity, thus opening up the numbers of available building staff who could be trained to conduct the time-intensive, one-on-one interventions in addition to the general music specialist.

Summer Musical Intervention Programs

In addition, I would like to conduct research with study groups of below grade-level readers who participate in musical intervention programs during a period of summer school. Typically, children who struggle to read do not like to read and therefore do not choose to read during the summer months. With an out-of-the-box, highly engaging and active, fun way for kids to develop their internal rhythmicity through singing, dancing, and chanting; improve gross-motor and fine-motor functions through movement and playing instruments; and practice repeated readings through reading “walks,” perhaps the students’ cwpm fluency in September will not reflect the steep declines from their June cwpm fluency scores that are presently discouraging students and teachers alike.

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APPENDIX

Intervention Lesson Plans

Intervention Lesson Plans

Lesson Plan One

Opening Pulse Activity – 5-8 minutes

Music – *Blackberry Quadrille*, from *Weikart Rhythmically Moving*, Recording #2

- Begin with the Weikart four-step process: 1) say, 2) say and do, 3) think and do, and 4) do
- Use bilateral (two hands together) patsching, moving from using “legs” to “shoulders” to “head”
- Begin first without music (external pulse) and then the same process with music
- Example:
 - Speak in steady pulse (SAY), “legs, legs, legs, legs”
 - four beat measure, in sets of 8
 - Speak and patsch legs bilaterally (SAY AND DO)
 - four beat measure, in sets of 8
 - Patsch legs whispering the words (WHISPER AND DO) – could “put it on your lips”
 - four beat measure, in sets of 8
 - Patsch legs (THINK AND DO) – the students have now internalized the pulse
 - four beat measure, in sets of 8
- Continue pulse activity with feet marching in place first
 - If needed, use the term, “march, march, march, march”
- Continue activity moving to locomotor movement, marching or walking around the room to the external pulse of the music
- Be sure to stress moving in one’s own space
 - Change direction if you need to
 - No pushing
 - Stay off the risers
- Monitor the accuracy of the students
 - If one is struggling, hold their hand and move with them
 - Chant the words, “march,” or “step” to guide them
- Students should count out loud (to eight) with you
- Make sure their foot touches the ground each time they say a number
- Sometimes a quiet clap will help them match their feet to the beat

Vocal Warm-Up Activity – 2-3 minutes

- Echo warm-up exercises with students
 - Start with a “yawn,” moving the voice down
 - “Oo” vowel moving the voice up

- “Uh-huh,” moving up and “uh-huh” moving down
- Model the mimic of a puppy whining – in the head voice
- Try a siren sound
- Have students “hide” one ear while they move their other hand to show the melodic contour of each exercise--sometimes this is called the “magic microphone”

Language/Pulse Activity - 10-15 minutes

- Recite the poem, *Peas Porridge Hot*
 - Echo teach the lines of the poem; phrase by phrase, then combining two phrases, and finally all four phrases
- Repeat the process with the second verse
- Recite the poem again with bilateral patsching, quarter note pulse
- Echo sing each phrase on Sol and Mi, Mi Re Do for final phrase
 - Follow the same process with extending the phrases as with the speaking of the poem
- Add the bilateral patsching with the singing
- Have students sit in a “canoe row,” one behind the other
 - Position yourself behind the student who appears to be struggling the most with patsching the pulse
- Sing the four phrases, all tapping the student in front to the pulse
 - Stress using a gentle tap on the top of the back
- At the end of the two verses, turn around
- Repeat the song and the patsching on the student in front of each
- The child in the front of the line will patsch his or her legs
- Repeat as time warrants

Notes:

If a student is struggling with steady beat, try to tap lightly on their shoulders, their legs, or the top of their head to help guide them to accuracy.

If a student is struggling with matching pitch, stop and play some vocal movement games again—sirens, voices sliding up and down with a slide whistle, voices guided by pointing fingers up and down and matching voices to a student “director.”

Lesson Plan Two

Opening Pulse Activity – 5 minutes

Music – *The Hustle*, from *Weikart Rhythmically Moving*, Recording #9

It is possible to use any other instrumental piece of music with a strong steady pulse, not too fast

- Review Weikart four step process: 1) say, 2) say and do, 3) think and do, and 4) do
 - Use bilateral (two hands together) patsching, moving from “legs” to “shoulders” to “head”
 - Begin first without music (external pulse),
 - Same process with music

- Example:
 - First speak in steady pulse (SAY), “legs, legs, legs, legs”
 - four beat measure, in sets of 8
 - Speak and patsch legs bilaterally (SAY AND DO)
 - sets of 8
 - Patsch legs whispering the words (WHISPER AND DO)
 - sets of 8
 - Patsch legs (THINK AND DO) The students have now internalized the pulse
 - sets of 8

- Continue pulse activity with feet marching in place first
 - If needed, use the terms, “march, march, march, march”

- Continue activity moving to locomotor movement, marching or walking around the room to the external pulse
 - Be sure to stress moving in own space, changing direction if needed, no pushing, off the risers

- Monitor the accuracy of the students—if struggling, hold hand and move with them, or chant the words, “march,” or “step” to guide
 - Students should count out loud to eight with you
 - Tell them to make sure their foot touches the ground each time they say a number
 - Sometimes a quiet clap will help them match their feet to the beat!

Rhythm Recognition - 3 minutes

- Begin with echo clapping
- Start with simple rhythms of quarter notes and eighth notes, one four beat phrase
- If not accurate, repeat the same rhythm until accurate

- Add the syllabage (TA, TI TI, etc.) to help with accuracy

This is an auditory discrimination skill that is very important!

Vocal Warm-Up Activity – 2 minutes

- Echo warm-up exercises with students.
 - Start with a “yawn,” moving voice down
 - “Oo” vowel moving voice up
 - Try “uh-huh,” moving up and “uh-huh” moving down
 - Model mimic of a puppy whining – in the head voice
 - Siren sound

- Students “hide” one ear while they move other hand to show melodic contour of each exercise—sometimes this is called the “magic microphone”

Melodic Contour Activity – 3 minutes

- Using tone bell stair, glockenspiel, or xylophone, play simple, step-wise melodic patterns, 5 to 8 pitches, up and down
- Ask students whether sound of the instrument is going up or going down
- Repeat exercise until accurate, singing along on neutral syllable, la, if assistance is needed
- If accurate quickly, play the same patterns but ask students to close eyes and determine direction of the pattern
 - Use the phrase, “This is an ear test, you cannot use your eyes to help your ears”
 - Refer to exercise as a “game”

This is another critical auditory discrimination skill.

Language/Pulse Activity - 10-15 minutes

- Review the process of Lesson #1
- Recite the poem, *Peas Porridge Hot*
- Recite the poem with bilateral patsching, quarter note pulse
- Recite the poem again with patsching rhythm of the words, making sure students are alternating hands
 - Use the phrase, “Give each hand a turn”
- This will probably not be successful with students the first time
- Repeat a few times and move on
- Echo sing each phrase on Sol and Mi, Mi Re Do for final phrase
 - Follow same process extending phrases as with speaking of poem
- Add the bilateral patsching with singing
- Have students sit in “canoe row,” one behind the other
- Position yourself behind student who struggles the most with patsching pulse
- Sing four phrases, all tapping the student in front to pulse
- Stress using a gentle tap on the top of the back
- At the end of two verses, turn around
- Repeat song and patsching on student in front of each

- The child in the front will pat his or her own legs
- Repeat as time warrants

- Use a bass xylophone to transfer the steady quarter note pulse to bordun (C & G, or D & A)
 - One student, both hands
- Remind students of the proper way to hold the mallets.
 - Use the phrase, ‘Pinch, wrap, turn’
- Repeat so each student plays while others sing melody

Notes:

If a student is struggling with steady beat, try to tap lightly on their shoulders, their legs, or the top of their head to help guide them to accuracy.

If a student is struggling with matching pitch, stop and play some vocal movement games again – sirens, voices sliding up and down with a slide whistle, voices guided by pointing fingers up and down and matching voices to a student “director.”

Lesson Plan ThreeOpening Pulse Activity – 5 minutesMusic – *Irish Washerwoman*, from *Weikart Rhythmically Moving*, Recording #3

- Review the Weikart process: 1) say, 2) say and do, 3) whisper and do, and 4) think and do
 - Without music (internal pulse), non-locomotor bi-lateral patsching, speaking in a steady pulse, “head, head, head, head,” four beat measures, sets of 8
 - locomotor movements, marching, walking, jumping, etc.
 - four beat measures, sets of 8
 - Repeat the same process with the music (external pulse)
 - count with numbers
 - verbalize movements (“march, march, march, march”)
 - clap quietly on pulse
 - hold hands and move with students

Rhythm Recognition – 3 minutes

- Begin with echo clapping
- Start with simple rhythms of quarter notes, eighth notes, and quarter rest, one four beat phrase
- If students are not accurate, repeat the same rhythm, up to four times, until accurate
- Add syllabage (TA, TI TI, REST, etc.) to help with accuracy
 - This is an auditory discrimination skill that is very important!

Vocal Warm-Up Activity – 2- 3 minutes

- Direct students in moving voices up and down on an “oo”
- Use a baton, a mallet, a magic wand, a pointer, or any other appropriate and accessible prop
- Have students vocalize an “oo” staying on the same pitch
 - Director’s prop should move in a “straight across” fashion
- Students decide on “start” and “stop” signal for director to use
- After modeling activity, have students use prop to direct in same manner

Melodic Contour Activity – 3 minutes

- Using tone bell stair, glockenspiel, or xylophone propped up with books on the higher end (visual cue), play simple, step-wise melodic pattern 5 to 8 pitches, up and down
 - Ask students to tell you whether the sound of the instrument is going up or going down
- Have students follow direction of sound with pretend “paintbrush” in hand

- Repeat exercise, up to four times, until accurate, singing along on neutral syllable, “la,” if assistance is needed
 - If students are accurate quickly, play same patterns but ask students to close eyes, determining with ears the way their paintbrush should move to follow direction of melody
 - Use the phrase, “This is an ear test, try not to use your eyes to help your ears
 - Refer to exercise as a “game”
- This is another critical auditory discrimination skill

Language/Pulse Activity – 15 minutes

- Recite poem, *Peas Porridge Hot* with bilateral patsching, quarter note pulse
- Recite poem again patsching the rhythm of the words
 - Make sure that students alternate hands
 - use the phrase, “Give each hand a turn”
- Repeat process with singing voices on poem, patsching steady pulse
- Sing poem again, patsching rhythm of words
- Using tubanos, djembes, congas, hand drums, tambourines, or whatever is available to you, have students repeat the process with speaking and drumming
- Start first with speaking and steady pulse (including the rest), both hands
- Speaking and the rhythm of the words, alternating hands
 - This will, most likely, be difficult for students
- Repeat until successful with activity or time expires

Lesson Plan Four

Opening Pulse Activity – 5 minutes

Music – choose from any of the *Rhythmically Moving* pieces used thus far, *Blackberry Quadrille* (recording # 2), *The Hustle* (recording # 9), or *Irish Washerwoman* (recording #3)

- Begin right away with the music (external pulse)
 - Review marching in place
 - use the words, “march, march, march, march,” if necessary
- Continue with locomotor movement
 - Walking, marching, hopping (1 foot), jumping (2 feet, in place), walking backward, etc.
 - continue with speaking the action words out loud
- Students should move to the pulse in their own way
 - In place (non-locomotor)
 - Through space (locomotor)
- Find students to mimic, saying, “let’s move to the beat like _____ is moving”
 - Give each student an opportunity to be the “leader”

Rhythm Recognition – 3 minutes

- Begin with echo clapping
 - Start with simple rhythms—quarter notes, eighth notes, quarter rest, one four beat phrase
 - when students are not accurate, repeat the same rhythm, up to four times, until they are accurate
 - add syllabage (TA, TI TI, REST, etc.) to help with accuracy—this is an auditory discrimination skill that is very important!

Vocal Warm-Up Activity – 2- 3 minutes

- Have student “director” lead students in moving voices up and down on “oo”
- Student director may use a baton, a mallet, a magic wand, a pointer, or any appropriate and accessible prop
- Student director has students vocalize an “oo” staying on the same pitch
 - Director’s prop should move in a “straight across” fashion for this
- Students should decide on a “start” and “stop” signal for director to use

Melodic Contour Activity - 3 – 5 minutes

- Using tone bell stair (or glockenspiel or xylophone propped up with books on the higher end for a visual cue) play simple, step-wise melodic patterns, 5 to 8 pitches
 - going up
 - down
 - staying the same

- Students respond with movement – stand up and stretch when pattern goes up, reach down to floor when pattern goes down
- On same pitch, students stand with arms out, moving side-to-side, twisting at waist
- Students make up their own movements to accurately reflect the melodic contour
- Finish activity with melodic contour of *Peas Porridge Hot* in sequence, asking students to respond with body movements
- If students do not recognize the melody, play song in its entirety so students are successful in recognizing the piece

Language/Pulse Activity – 10-15 minutes

- Review *Peas Porridge Hot* with singing voices, patsching steady pulse bilaterally
- Repeat song, changing patsching to rhythm of the words, alternating hands
- Repeat song again, asking students to follow melodic contour with their hands
 - Ask questions for accuracy, “when you sang the word porridge did your hands go up or down?”
- Using alto xylophones with lower Sol, Mi, Re, and Do bars (G, E, D, & C in C major, or A, F#, E & D in D major) tell students starting pitch, or which bar to begin melody on
- Allow them to figure out next pitches, ones for the words, “Peas, porridge hot”
- Guide by asking questions
 - “Does the melody go up? Down? Stay the same?”
 - What is the rhythm?
 - How many times do we play the same bar?
 - Where do we go now?”
- Assist in discovering correct bars for melody and correct rhythms to complete song
- Preferably students work with two mallets, one in each hand, but may need to begin with one mallet/one hand to be successful
- Allow up to a minute to figure out each phrase
- Link phrases together asking, “Is peas, porridge cold” the same or different than “peas, porridge hot?”
- Initial process should be done together as a group first
 - Students given a turn to “discover” and play melody on their own.
- Extension—students play steady pulse bordun (C & G or D & A) on bass xylophone
 - Add melody simultaneously on alto xylophone or glockenspiel

Lesson Plan Five

Opening Pulse Activity – 15 minutes

From Marian Rose's *Step Lively* folk dance resource, *Sasha*

- Ask students if they can count to three in any other language
- After participatory discussion, have students count to three in the Russian as suggested in the teachers' notes (Ras, Dvah, Tre!) pointing and counting to the pulse with their three fingers. "Sasha, Sasha, ras, dvah, tre!"
- Repeat several times, changing the language to fit the pulse and your particular students' knowledge of languages
- For the first few minutes of listening to the recorded music, have students bilaterally pat the steady beat
- Without partners, speak the words, "right, right, right, left, left, left, both, both, both, knees, knees, knees"
- Repeat the same words again in succession
- Add hand motions without a partner, being certain to cross the midline as if they have a partner to work with
- Add partners
- Practice with speech only first, rather slowly
- Add the music for the first two sets of eight in this A section, plus the "Sasha" introduction
- When this section is successfully up to tempo, add the next two sets of 8, which is a right elbow swing for 7 counts with a "Hey!" on count 8, then a left elbow swing and "Hey!" on count 8
- This is the A section.

- B section is for walking to the steady beat, four sets of eight and preparing to begin again
- Have students first verbally count out loud to 32 without moving (SAY)
- Count to 32, stepping on each number (SAY AND DO) stopping on 32
- Whisper to 32, stepping on each number (WHISPER AND DO) stopping at 32
- Just step, internalizing the steady pulse (THINK AND DO) stopping on 32
- Students can "put the numbers on their lips," but should not verbalize the speech out loud
- When successful with this step, add the music to complete the dance

This is a repetitive dance. You may suggest that they find a new partner with each repeat, or they can continue with the same partner for ease.

Language/Pulse Activity – 15 minutes

Poem – *Loose Tooth*

I have a loose tooth,
A wiggly-jiggly loose tooth
I have a loose tooth, a
Hangin' by a thread!

So I pulled my loose tooth,
My wiggly-jiggly loose tooth, and
Now I have a quarter and a
Hole in my head!

- Recite the poem for the students in a straight duple meter with a strong accented beat one
- Echo process each phrase, both verses
- Add a bilateral patsch to the poem
- Repeat the poem again, patsching with alternating hands
- Repeat the poem again, stepping to the steady pulse while speaking it
- Try alternate ways of stepping the pulse while reciting the poem – stepping sideways, backwards, on tiptoes, marching, etc.

Lesson Plan Six

Opening Pulse Activity – 5 - 8 minutes

A review of *Sasha* from Marian Rose's *Step Lively* folk dance resource, p. 20, CD #7

Before you begin the dance, review the following:

- Saying the steps out loud with the language; “right, right, right, left, left, left, both, both, both, knees, knees, knees”
- Facing a partner and practicing these hand jive movements
- Facing a partner and adding the right elbow swing and the left elbow swing
- Walking to the pulse and counting out loud the numbers – 1, 2, 3, 4, to 32

Dance !

Rhythm Recognition – 5 minutes

- Begin with echo clapping
 - Start with very simple rhythms composed of quarter notes, eighth notes, and the quarter rest
 - One four beat phrase
 - When students are accurate, extend the patterns to two four beat phrases
- If the students have been consistently accurate with quarter notes and eighth notes, try a syncopated rhythm with a single eighth note followed by a quarter note in various patterns
- Add the syllabage (TI, TA, TI, REST, etc.) to help with accuracy

Language/Pulse Activity – 15 minutes

Poem – *Loose Tooth*

I have a loose tooth,

A wiggly-jiggly loose tooth

I have a loose tooth, a

Hangin' by a thread!

So I pulled my loose tooth,

My Wiggly-jiggly loose tooth, and

Now I have a quarter and a

Hole in my head!

- Recite the poem in a straight duple meter with a strong accented beat one
- Add a steady pulse bilateral patsch while speaking the poem
- Repeat the poem while patsching alternating hands on the steady pulse
- Ask students to play hand drums with the poem playing on the words, “loose tooth” each time those words are spoken
- Have some students stay on the hand drum part (loose tooth), add others on “wiggly-jiggly” (dotted quarter/eighth) with a quiro or vibraslap, making certain students still speak the poem
- Brainstorm with the students an instrument choice for the words, “hangin’ by a thread,” “quarter,” and “hole in my head,” (according to the number of students in your group)
- Each student should have an individual, or solo, part to play with the spoken poem
- Be certain students speak the entire poem while they are playing their ‘words’ part

Lesson Plan Seven

Opening Pulse Activity – 3 minutes

Dance *Sasha*

- See if students can perform the dance from memory without reviewing the steps
- During the B section ask students to move to the pulse in specific ways: on tiptoe, walking backward, jumping on two feet, hopping on one foot, toes pointing in, toes pointing out, clapping while walking to the pulse, etc.
- If students stray from matching their feet to the pulse accurately, add the counting out loud of the numbers, 1 to 32, or simply the word, “step, step, step...or jump, jump, jump, etc., according to the movement

Rhythm Recognition – 5 minutes

- Begin with echo clapping
- Start with very simple rhythms composed of quarter notes, eighth notes, and the quarter rest, one four beat phrase
- When students are accurate, extend the patterns to two four beat phrases
- If the students have been consistently accurate with quarter notes and eighth notes, try a syncopated rhythm with a single eighth note followed by a quarter note in various patterns
- Extend the syncopation patterns to two four beat phrases
- Add the syllabage (TI, TA, TI, REST, etc.) to help with accuracy.

Vocal Warm-Up Activity – 2- 3 minutes

- Have a student “director” lead the students in moving voices up and down on an oo vowel
- Student director may use a baton, a mallet, a magic wand, a pointer, or any other appropriate and accessible prop
- Student director should also have students vocalize an oo vowel staying on the same pitch
 - Director’s prop should move in a “straight across” fashion for this.
- Students should decide on a “start” and “stop” signal for the director to use.
- Students and the “director” match their vocal movements with body movements, up, down, or same

Vocal Pitch Matching Activity – 3-5 minutes

- Use SMLSM for “singing conversations,”
- Teacher sings “question” and individual students “answer” matching the pitches and intervals
 - Sing me your name

- What's your favorite color/ice cream/sport/subject
- Who is your valentine/best friend

Language/Pulse Activity 10-12 minutes

Poem – *Loose Tooth*

I have a loose tooth, a
 Wiggly-jiggly loose tooth
 I have a loose tooth, a
 Hangin' by a thread!

So I pulled my loose tooth, my
 Wiggly-jiggly loose tooth, and
 Now I have a quarter and a
 Hole in my head!

- Recite the poem in a straight duple meter with a strong accented beat one
- Encourage students to move their voices up and down so as not to remain on one pitch throughout the poem
- Add a steady pulse bilateral patsch while speaking the poem
- Repeat the poem while patsching alternating hands on the steady pulse
- Have students step to the pulse while reciting the poem again
- Brainstorm with the students an instrument choice for the words, “loose tooth, wiggly-jiggly, hangin' by a thread, quarter, hole in my head,” (according to the number of students in your group)
- Each student should have an individual, or solo, part to play with the spoken poem
- Be certain students speak the entire poem while they are playing their ‘words’ part
- Ask students to “internalize” the assigned words (“say it in your head, but not out loud”) without playing first
- Students play their assigned part internalizing their word along with internalizing the other assigned words, but speaking the others
 - “I have a _____ a

- _____
- I have a _____ a
- _____
- So I pulled my _____ my
- _____ and
- Now I have a _____ and a
- _____!

Teacher should use a hand drum to tap quietly the rhythm of the entire poem while students internalize ALL the words.

Lesson Plan Eight

Opening Pulse Activity 5-8 minutes

Irish Stew from Weikart's *Rhythmically Moving #2*, musical selection – *Rakes of Mallow*

- Students patsch bilaterally to the steady beat, counting aloud 1-8, 32 counts (A section, 4 sets of 8)
- Students patsch to the steady beat alternating hands, counting aloud 1-8, 32 counts (A section, 4 sets of 8)
- Students step in place to the steady beat, counting aloud 1-8, 32 counts (A section, 4 sets of 8)
- Students walk to the steady beat, counting aloud 1-8, 32 counts (A section, 4 sets of 8)
- B section – “jump, jump, clap, clap,” have students say the pattern first, 32 counts
- B section – “jump, jump, clap, clap,” students say and do the pattern, 32 counts
- B section – “jump, jump, clap, clap,” students whisper and do the pattern, 32 counts
- B section – “jump, jump, clap, clap,” students think and do the pattern, 32 counts
- Students will walk to the steady beat on the A section, and stand in place to perform the B section
- Students can alternate the way they walk to the beat in the A section – backward, sideways, tiptoes, skip, etc., stop and perform the B section in place

Vocal Pitch Matching Activity 5 - 8 minutes

- Have students echo back to you using the syllable “la” on the following vocal patterns
 - SMSM
 - SSMLSM
 - MRD
 - DRM
 - DRMFS
 - SFMRD
- Students should echo sing all together and then echo back to you one at a time
- Please make a
- note of their accuracy or inaccuracy

Language/Pulse Activity 10-15 minutes

Poem – *Loose Tooth*

I have a loose tooth, a
Wiggly-jiggly loose tooth
I have a loose tooth, a
Hangin' by a thread!

So I pulled my loose tooth, my
Wiggly-jiggly loose tooth, and
Now I have a quarter and a
Hole in my head!

- Recite the poem in a straight duple meter with a strong accented beat one
- Have students patsch the rhythm of the words, alternating the hands
- Have students practice using mallets “in the air” to match the rhythm of the words
- Transfer to improvising the rhythm of the words on the barred instruments - xylophones and/or glockenspiels - set up in pentatonic (remove the E's and B's for F pentatonic, or the B's and F's for C pentatonic)
- Make sure each child gets a turn to improvise on the barred instruments
- Add the hand drum on “loose tooth” only, with the barred instruments on the rhythm of all the words, including “loose tooth”
- Have the hand drum only play on “loose tooth,” the barred instruments all improvising on the rhythm of the other words for the rest of the poem

Lesson Plan Nine

Opening Pulse Activity 5 - 8 minutes

Review *Irish Stew* from Weikart's *Rhythmically Moving #2, Rakes of Mallow*

- Students patsch bilaterally to the steady beat, counting aloud 1-8, 32 counts (A section, 4 sets of 8)
- Students patsch to the steady beat alternating hands, counting aloud 1-8, 32 counts (A section, 4 sets of 8)
- Students step in place to the steady beat, counting aloud 1-8, 32 counts (A section, 4 sets of 8)
- Students walk to the steady beat, counting aloud 1-8, 32 counts (A section, 4 sets of 8)
- B section – “jump, jump, clap, clap,” have students say the pattern first, 32 counts
- B section – “jump, jump, clap, clap,” students say and do the pattern, 32 counts
- B section – “jump, jump, clap, clap,” students whisper and do the pattern, 32 counts
- B section – “jump, jump, clap, clap,” students think and do the pattern, 32 counts
- Students will walk to the steady beat on the A section, and stand in place to perform the B section
- Students can alternate the way they walk to the beat in the A section – backward, sideways, tiptoes, skip, etc., stop and perform the B section in place
- Allow students to come up with their own creative, alternative ways of performing the B section – two different patterns of movement, repeated, ie. – “kick, kick (alternating r. and l.), snap, snap,” or “touch (toe) touch (toe, same foot), punch, punch (alternating fists/arms in the air),” or “jump (forward), jump (backward), patsch, clap,” etc.

Vocal Melodic Pattern Recognition 8-10 minutes

- Perform the following sets of melodic patterns on the syllable “LOO,” with constant (unchanging) rhythm patterns (to avoid confusion because of rhythm); ask students to listen carefully and determine if they are the same or different patterns
- If students are incorrect, repeat the pattern drawing their attention to the cause of the inaccuracy – “it doesn’t change, it stays the same,” or “it goes up, not down,” etc.
- Have students sing with you to reinforce the corrections
 - SMSM and SMSM
 - SMSM and SMMM
 - SSMLSM and SSMMSSMM
 - SSMLSM and SSMLSM
 - MRD and MRD
 - MRD and MMM

- DRM and DRM
- DRM and DRR
- DRMFS and SFMRD
- DRMFS and DRMFS
- SFMRD and SFMRD
- SFMRD and SMFRD

Rhythm Pattern Recognition 8-10 minutes

- Using a triangle or other simple percussion instrument that has duration (the sound lasts/rings) play the following sets of rhythm patterns; ask students to listen carefully and determine if they are the same or different patterns
- If students are inaccurate, repeat the pattern, asking, “Are you sure?”
- If students are inaccurate again simply say, “we will try that one again next time”
 - four quarter notes in a row and four quarter notes in a row
 - four quarter notes in a row followed by quarter, quarter, two eighths, quarter
 - four quarter notes in a row followed by quarter, rest, quarter, rest
 - four quarter notes, followed by the same
 - two eighths, two eighths, two eighths, quarter, followed by the same
 - two eighths, two eighths, two eighths, quarter, followed by two eighths, two eighths, two eighths
 - quarter, rest, quarter, rest, followed by quarter, rest, rest, quarter
 - quarter, rest, quarter, rest, followed by the same
 - quarter, quarter, quarter, quarter, followed by quarter, quarter, half note
 - quarter, quarter, half note, followed by the same
 - half note, half note, followed by half note, quarter, quarter
 - half note, half note, followed by the same
 - single eighth, quarter, single eighth, quarter, quarter, followed by the same
 - single eighth, quarter, single eighth, quarter, two eighths, followed by single eighth, quarter, single eighth, quarter, quarter

Poem/Rhythm Walk 3-5 minutes

Prior to the lesson time, make enough copies of the following poem to distribute to each student

- Ask students to read the poem aloud, together
- Define any unknown vocabulary
- “Next time we will do something else with this poem”

I wish, how I wish,
that I had a little house, with a
mat for the cat, and a
hole for the mouse, and a
clock going tock in the
corner of the room, and a
kettle, and a cupboard, and a
big, birch broom!

Lesson Plan Ten

Opening Pulse Activity - 5 minutes

Use a musical recording of your choice, moderate tempo, with a strong, recognizable pulse.

- Ask students to move to the steady beat in their own way, non-locomotor movement (in place)
- Find a student with a good example and ask others to copy – “Let’s move like _____ is moving”
- “Move your own way now, be sure to keep the steady beat”
- Ask students to move to the steady beat in their own way, locomotor movement (through space)
- Find a student with a good example and ask others to copy – “Let’s move like _____ is moving”
- Be certain to insist on moving to the pulse, assisting students if necessary with words, either counting or movement directions (step, step, step, step, etc.)

Vocal Melodic Pattern Recognition 8-10 minutes

- Perform the following sets of melodic patterns on the syllable “LOO,” with constant (unchanging) rhythm patterns (to avoid confusion because of rhythm); ask students to listen carefully and determine if they are the same or different patterns
 - Students should be instructed to answer same and different with numbers of fingers – “put up 1 finger for same, 2 fingers for different”
- If students are incorrect, repeat the pattern drawing their attention to the cause of the inaccuracy – “it doesn’t change, it stays the same,” or “it goes up, not down,” etc.
- Have students sing with you to reinforce the corrections
 - SMSM and SMSM
 - SMSM and SMMM
 - SSMLSM and SSMMSSMM
 - SSMLSM and SSMLSM
 - MRD and MRD
 - MRD and MMM
 - DRM and DRM
 - DRM and DRR
 - DRMFS and SFMRD
 - DRMFS and DRMFS
 - SFMRD and SFMRD
 - SFMRD and SMFRD

Rhythm Pattern Recognition 8-10 minutes

- Using a triangle or other simple percussion instrument that has duration (the sound lasts/rings) play the following sets of rhythm patterns; ask students to listen carefully and determine if they are the same or different patterns
 - Students should be instructed to answer same and different with numbers of fingers – “put up 1 finger for same, 2 fingers for different”
- If students are inaccurate, repeat the pattern, asking, “Are you sure?”
 - If students are inaccurate again ask, “Do you hear short sounds? How many? Where? Long sounds? Where?”
- Use ikon packets with students to help them visualize what they are hearing and to clear up inaccuracies
- Try to complete as many patterns listed below as possible, but stop after 10 minutes
 - four quarter notes in a row and four quarter notes in a row
 - four quarter notes in a row followed by quarter, quarter, two eighths, quarter
 - four quarter notes in a row followed by quarter, rest, quarter, rest
 - four quarter notes, followed by the same
 - two eighths, two eighths, two eighths, quarter, followed by the same
 - two eighths, two eighths, two eighths, quarter, followed by two eighths, two eighths, two eighths
 - quarter, rest, quarter, rest, followed by quarter, rest, rest, quarter
 - quarter, rest, quarter, rest, followed by the same
 - quarter, quarter, quarter, quarter, followed by quarter, quarter, half note
 - quarter, quarter, half note, followed by the same
 - half note, half note, followed by half note, quarter, quarter
 - half note, half note, followed by the same
 - single eighth, quarter, single eighth, quarter, quarter, followed by the same
 - single eighth, quarter, single eighth, quarter, two eighths, followed by single eighth, quarter, single eighth, quarter, quarter

Poem/Rhythm Walk 3-5 minutes

Prior to the lesson time, make enough copies of the poem for each student to have a copy to hold in their hand

- Ask students to read the poem aloud, together
- Ask students to read the poem and walk around the room at the same time, in no particular path
 - Students should read at their own pace, not together

- Students should be aware of their own space, taking care not to bump into one another
- Repeat reading the poem/walking several times

I wish, how I wish,
that I had a little house, with a
mat for the cat, and a
hole for the mouse, and a
clock going tock in the
corner of the room, and a
kettle, and a cupboard, and a
big, birch broom!

Lesson Plan Eleven

Opening Pulse Activity - 5 minutes

Music – *Can't Jump Josie*, #2 from *Step Lively*

Tempo changes from slow to fast

- Ask students to move to the steady beat in their own way, non-locomotor movement (in place) on the slow section
 - Find a student with a good example and ask others to copy – “Let’s move like _____ is moving”
 - “Move your own way now, be sure to keep the steady beat”
- Ask students to move to the steady beat in their own way, non-locomotor movement (in place) on the fast section
 - Find a student with a good example and ask others to copy – “Let’s move like _____ is moving”
- Ask students to move to the steady beat in their own way, locomotor movement (through space) on the slow section
 - Find a student with a good example and ask others to copy – “Let’s move like _____ is moving”
- Ask students to move to the steady beat in their own way, locomotor movement (through space) on the fast section
 - Find a student with a good example and ask others to copy – “Let’s move like _____ is moving”
 - Be certain to insist on moving to the pulse at the varying tempos, assisting students if necessary with words, either counting or movement directions (step, step, step, step, etc.)

Vocal Melodic Pattern Recognition 5-8 minutes (review)

- Perform the following sets of melodic patterns on the syllable “LOO,” with constant (unchanging) rhythm patterns (to avoid confusion because of rhythm); ask students to listen carefully and determine if they are the same or different patterns
 - Students should be instructed to answer same and different with numbers of fingers – “put up 1 finger for same, 2 fingers for different”
- If students are incorrect, repeat the pattern drawing their attention to the cause of the inaccuracy – “it doesn’t change, it stays the same,” or “it goes up, not down,” etc.

- Have students sing both patterns with you after each is correctly determined as same or different
 - SMSM and SMSM
 - SMSM and SMMM
 - SSMLSM and SSMMSSMM
 - SSMLSM and SSMLSM
 - MRD and MRD
 - MRD and MMM
 - DRM and DRM
 - DRM and DRR
 - DRMFS and SFMRD
 - DRMFS and DRMFS
 - SFMRD and SFMRD
 - SFMRD and SMFRD

Rhythm Pattern Recognition 5-8 minutes (review)

- Using a triangle or other simple percussion instrument that has duration (the sound lasts/rings) play the following sets of rhythm patterns; ask students to listen carefully and determine if they are the same or different patterns
 - Students should be instructed to answer same and different with numbers of fingers – “put up 1 finger for same, 2 fingers for different”
- If students are inaccurate, repeat the pattern, asking, “Are you sure?”
 - If students are inaccurate again ask, “Do you hear short sounds? How many? Where? Long sounds? Where?”
- Use ikon packets with students to help them visualize what they are hearing and to clear up inaccuracies
- Have students reproduce both rhythm patterns on a simple percussion instrument (that has duration) after each is correctly determined as same or different
- Try to complete as many patterns listed below as possible, but stop after 8 minutes
 - four quarter notes in a row and four quarter notes in a row
 - four quarter notes in a row followed by quarter, quarter, two eighths, quarter
 - four quarter notes in a row followed by quarter, rest, quarter, rest
 - four quarter notes, followed by the same
 - two eighths, two eighths, two eighths, quarter, followed by the same
 - two eighths, two eighths, two eighths, quarter, followed by two eighths, two eighths, two eighths
 - quarter, rest, quarter, rest, followed by quarter, rest, rest, quarter
 - quarter, rest, quarter, rest, followed by the same

- quarter, quarter, quarter, quarter, followed by quarter, quarter, half note
- quarter, quarter, half note, followed by the same
- half note, half note, followed by half note, quarter, quarter
- half note, half note, followed by the same
- single eighth, quarter, single eighth, quarter, quarter, followed by the same
- single eighth, quarter, single eighth, quarter, two eighths, followed by single eighth, quarter, single eighth, quarter, quarter

Rhythm Walk – 10 minutes

Prior to the lesson time, collect the students' basal reader or a small paperback book from the classroom set of *Treasures*. Make sure students have a copy of a book to hold in their hands and read. Select a short passage ahead of time with the help of the classroom teacher if necessary. Make sure that students know they must not bump into each other while walking—they must make their own path around the room.

- Ask students to read the passage together out loud first, with your assistance
 - Students should be seated
- Ask students to read the passage individually out loud
 - Students should be seated in various spots around the room
- Ask students to read the passage together out loud (with your assistance) while walking around the room
 - Stress “moving in your own space”
- Ask students to read the passage individually out loud while walking around the room
 - Stress “moving in your own space”

Lesson Plan Twelve

Opening Pulse Activity - 8 minutes

Music – *Can't Jump Josie*, #4 from *Step Lively*

Tempo changes from slow to fast

- Ask students to step to the steady beat in their own way, locomotor movement (through space) on the slow section
- Ask students to jump (both feet) to the steady beat, locomotor movement (through space) on the fast section
 - Repeat process twice before making a circle
- Have students face counter clockwise in the circle, remind them that we are all going to step to the slow steady beat at the same time
 - Say the words, “step, step, step,” etc. as the $\frac{3}{4}$ pattern is slow and students will want to rush
 - Using the arms to swing to the strong beat (1) will also help keep students on the pulse
- When the music changes to the fast section, each student should find a partner to hold both hands with and jump (both feet) to the steady pulse
 - My students and I find it fun to twirl around while jumping ☺
- The slow section will return – repeat as above saying, “step, step, step”
- The music will repeat each section several times, students should change partners throughout, if desired

Vocal Melodic Pattern Recognition 5 minutes only (review)

- Perform the following sets of melodic patterns on the syllable “LOO,” with constant (unchanging) rhythm patterns (to avoid confusion because of rhythm); ask students to listen carefully and determine if they are the same or different patterns
 - Students should be instructed to answer same and different with their palms – if pattern is the same both palms should face out from the student, if pattern is different, one palm faces forward (out) and one faces into the student, showing that one is different
- If students are incorrect, repeat the pattern drawing their attention to the cause of the inaccuracy – “it doesn’t change, it stays the same,” or “it goes up, not down,” etc.

- Have students sing both patterns with you after each is correctly determined as same or different
 - SMSM and SMSM
 - SMSM and SMMM
 - SSMLSM and SSMMSSMM
 - SSMLSM and SSMLSM
 - MRD and MRD
 - MRD and MMM
 - DRM and DRM
 - DRM and DRR
 - DRMFS and SFMRD
 - DRMFS and DRMFS
 - SFMRD and SFMRD
 - SFMRD and SMFRD

Rhythm Pattern Recognition 5-8 minutes only (review)

- Using a triangle or other simple percussion instrument that has duration (the sound lasts/rings) play the following sets of rhythm patterns; ask students to listen carefully and determine if they are the same or different patterns
 - Students should be instructed to answer same and different with their palms as before- two palms facing out mean same, one facing in and one out meaning different
 - If students are inaccurate, repeat the pattern, asking, “Are you sure?”
 - If students are inaccurate again ask, “Do you hear short sounds? How many? Where? Long sounds? Where?”
- Use ikon packets with students to help them visualize what they are hearing and to clear up inaccuracies
- Have students reproduce both rhythm patterns on a simple percussion instrument (that has duration) after each is correctly determined as same or different
- Try to complete as many patterns listed below as possible, but stop after 8 minutes
 - four quarter notes in a row and four quarter notes in a row
 - four quarter notes in a row followed by quarter, quarter, two eighths, quarter
 - four quarter notes in a row followed by quarter, rest, quarter, rest
 - four quarter notes, followed by the same
 - two eighths, two eighths, two eighths, quarter, followed by the same
 - two eighths, two eighths, two eighths, quarter, followed by two eighths, two eighths, two eighths, two eighths

- quarter, rest, quarter, rest, followed by quarter, rest, rest, quarter
- quarter, rest, quarter, rest, followed by the same
- quarter, quarter, quarter, quarter, followed by quarter, quarter, half note
- quarter, quarter, half note, followed by the same
- half note, half note, followed by half note, quarter, quarter
- half note, half note, followed by the same
- single eighth, quarter, single eighth, quarter, quarter, followed by the same
- single eighth, quarter, single eighth, quarter, two eighths, followed by single eighth, quarter, single eighth, quarter, quarter

Rhythm Walk – 10 minutes

Prior to the lesson time, collect the students' basal reader or a small paperback book from the classroom set of *Treasures*. Make sure students have a copy of a book to hold in their hands and read. Select a short passage ahead of time with the help of the classroom teacher if necessary. Make sure that students know they must not bump into each other while walking—they must make their own path around the room.

- Read a sentence aloud to students, using care to provide a prosodic (musical) sound to the phrase/sentence
- Ask students to repeat the phrase/sentence exactly the way they heard it
 - Students should be seated
 - Repeat the process for four phrases or one paragraph
- Ask students to read the passage together out loud (with your assistance) while seated, remind them to use the expression they practiced
- Ask students to read the passage individually out loud, remembering to use expression
 - Students should be seated in various spots around the room
- Ask students to read the passage individually out loud while walking around the room
 - Stress “moving in your own space”
 - Stress reading with expression and fluidity

- If time allows, choose a classical instrumental recording at a moderate pace to play quietly in the background while students are walking and reading; some suggestions, but not limited to
 - Vivaldi's *Spring*
 - Bach's *Air on the G String*
 - Chopin's *Nocturne in E flat*
 - Copland's *Theme and Variations on A Shaker Tune* (including the introduction)
 - Mozart's *Eine Kleine Nachtmusik*