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The Singing Instrumentalist:

A Sound-Before-Sight Approach in Instrumental Instruction

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Abstract

The purpose of this quantitative experimental study was to examine the impact of two differing instructional strategies in beginning band instruction. One approach followed a traditional method, emphasizing technical proficiency and note-reading skills, while the other adopted a sound-before-sight approach where aural and oral skills were nurtured before introducing notation. The experimental study involved fourth and fifth-grade beginning band students from a rural elementary school in the Midwest. All participants were randomly divided into either the experimental or control group. The control group (n = 21) received instruction using a traditional note-reading approach, whereas the experimental group (n = 22) was taught using a sound-before-sight method. This innovative method involved chanting, solfège signing, singing, and "singering" as the students learned to play traditional melodies on their instruments. Throughout the nine-week study, all participants attended weekly homogenous group lessons lasting twenty minutes each. Three standardized assessments were employed to measure and compare the average scores related to students' music aptitude and achievement in tonal listening and tonal reading skills. The evaluations conducted included Gordon's Intermediate Measure of Music Audiation – Tonal Subtest (IMMA TS), Iowa Tests for Music Literacy Tonal Concepts – Level 1 for Audiation/Listening (ITML T1), and Iowa Tests for Music Literacy Tonal Concepts – Level 1 for Audiation/Reading (ITML T2). These assessments were administered both before and after the instructional period. Analysis of the post-test results, using independent samples t-test, revealed no significant differences between the experimental and control groups for the IMMA TS and ITML T1 assessments. However, post-test scores between the experimental and control groups for the ITML T2 displayed a statistically significant difference. Additionally, observations of the mean score changes from paired t-tests across all three assessments indicated

significant differences between the experimental and control groups. The results, coupled with the substantial effect size calculations, affirm the efficacy of the treatment and emphasize the necessity for further research into sound-before-sight strategies and their influence on the development of music achievement skills, particularly in the context of beginning band instruction.

Keywords: audiation, aural/oral skills, beginning band instruction, chanting, Gordon, Mason, music achievement, music aptitude, music learning theory (MLT), Pestalozzi, sequential learning, quantitative experimental study, singing, "singering," solfège, sound-before-sight, sound-before-symbol, vocalization

Dedication

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Abbreviations

AMMA	Advanced Measures of Music Audiation
IMMA TS	Intermediate Measures of Music Audiation – Tonal Subtest
ITML T1	Iowa Tests of Music Literacy Tonal Concepts Level One, Audiation/Listening
ITML T2	Iowa Tests of Music Literacy Tonal Concepts Level One, Audiation/Reading
LSAs	Learning Sequence Activities
MAP	Music Aptitude Profile
MLT	Music Learning Theory
PMMA	Primary Measures of Music Audiation
RS	Raw Score

Chapter One: Introduction

This dissertation explores the benefits of vocalizing in a beginner band setting and is based on Gordon's research and development of music learning theory (MLT) and audiation. This theoretical approach emphasizes the significance of guiding students to listen to and comprehend the music they are learning before teaching them to read individual notes and rhythms. Music learning theory (MLT) draws parallels between learning music and language acquisition, where children learn to speak by listening. Before children begin talking, they first hear words in conversations. They then advance to imitating words and constructing sentences, eventually reaching the conversational level. At this stage, they are introduced to reading, where they learn to identify letters and understand the sequencing required to form written words. Gordon developed MLT to facilitate the transition of traditional music instructional methods toward a more logical and sequential approach, which mirrors the language acquisition process. In the MLT approach, students are initially guided to hear, think about, and imitate musical patterns before progressing to identify and read notation.

Implementing music learning theory (MLT) principles shifts the focus from notation instruction to initially engaging students in singing and chanting tonal and rhythm patterns. This approach enhances students' audiation skills. It allows them to perceive, interpret mentally, and reproduce musical sounds, fostering their listening comprehension (aural skills) and verbal expression abilities (oral skills). Through sequential singing and chanting of these patterns, along with song instruction, students develop the ability to audiate, listen, and think in sound. This process empowers them to perform and understand music before relying on notation.

After a thorough analysis of literature emphasizing sound-before-sight principles, including its historical significance, practical benefits, and alignment with music learning theory

(MLT), the researcher experienced a realization of the vital necessity to introduce sequential instruction, starting with listening and singing in a beginning band setting. This conviction prompted a quantitative experimental study to examine whether incorporating listening and singing activities before notation instruction could improve music aptitude and achievement post-test scores among beginning band students. The study aimed to determine whether enhancing audiation skills through a sound-before-sight approach rooted in music learning theory (MLT) principles could affect audiation growth compared to traditional methods focusing on technical aspects of reading music.

The researcher employed two distinct instructional strategies with separate groups of beginning band students. One strategy aimed to develop student audiation skills by employing a sound-before-sight approach, which involved listening and vocalizing melodic and rhythmic patterns derived from commonly used folk songs in beginner band instruction. The other strategy adhered to a traditional instructional approach found in most beginning band method books, introducing music notation at the outset of instruction. The researcher's hypotheses suggested that students who engaged in activities such as listening to and vocalizing melodic and rhythmic patterns, singing, and "singering" the notes before learning notation would show more significant improvement in their music achievement and audiation scores compared to students instructed using traditional methods. The researcher applied music learning theory (MLT) principles to enhance the development of audiation skills and examine how vocalization strategies affect the learning process and performance outcomes of beginning band students.

In this nine-week experimental study, forty-three students were randomly assigned to either an experimental or control group. The experimental group received instruction using a nontraditional sound-before-sight approach, which focused on developing aural/oral skills

through listening, chanting, singing, solfège signing, and “singering” before introducing notation. In contrast, the control group followed a conventional instructional method outlined in beginning band method books, introducing music notation from the first lesson.

The post-test scores of the IMMA TS, ITML T1, and ITML T2 standardized tests were analyzed to evaluate the effects of the treatment on tonal music aptitude and tonal achievement in listening and reading concepts among the beginning band students. Additionally, paired *t*-tests were conducted using pre- and post-test scores to assess changes within each group over time, providing insights into the effectiveness of the interventions and allowing for comparisons between the experimental and control groups. The hypotheses suggested that the experimental group, which began by listening to and vocalizing melodic and rhythmic patterns before learning notation, would achieve higher scores compared to the control group, which received instruction using traditional methods.

Background

Gordon’s Music Learning Theory

Edwin E. Gordon was a performer, researcher, and professor who dedicated many years to studying the process of music learning, primarily focusing on understanding how children learn music. Throughout his research, he emphasized two foundational music learning concepts: aptitude and audiation. Gordon’s findings revealed that reading and performing music involve a more profound cognitive process beyond merely playing or vocalizing notes. He believed music instruction should follow the same sequential approach young children use to learn to speak, read, and write. Children are initially encouraged to listen, imitate, and then talk long before being taught to recognize symbols and read words. Gordon emphasized that acquiring literacy,

including reading and writing skills, typically involves a five to six-year period of listening and imitation. Therefore, he supports a gradual sequential approach to music acquisition, emphasizing the importance of training students in hearing and singing tonal and rhythmic patterns.[1] This approach supports students in developing the fundamental skills and understanding necessary to comprehend and express music proficiently.

Inspired by the natural language acquisition process, Gordon researched and developed music learning theory (MLT). This theory promotes a sequential approach for teaching music to children, focusing initially on developing their ability to hear and echo melodic and rhythmic patterns. This model is designed to progressively introduce more complex patterns as students advance, building upon their previous learning.[2] Gordon's extensive research confirmed that children must comprehend what they hear and sing before progressing to higher levels of learning. He stressed the significance of children developing audiation skills, or the ability to "think in sound," as a prerequisite for advancement.[3] He argued that for children to learn and comprehend music effectively, they must follow a hierarchical progression similar to language acquisition: listening, speaking, thinking, reading, and writing.[4] Gordon emphasized that listening is the foundation for developing all other musical skills. Therefore, he advised against

[1] Maria Runfola and Cynthia C. Taggart, *The Development and Practical Application of Music Learning Theory* (Chicago, IL: GIA Publications, 2005), 480.

[2] Edwin E. Gordon, *Learning Sequences in Music: A Contemporary Music Learning Theory* (Chicago, IL: GIA Publications, 2012), viii.

[3] Edwin E. Gordon, "Taking a Look at Music Learning Theory an Introduction," *General Music Today* 8, no. 2 (Winter 1995): 3, https://doi.org/10.1177/104837139500800202.

[4] Ibid., 19.

introducing children to reading or writing music until they understand what they hear. He also stressed the importance of teachers knowing these sequential steps in music learning.[5]

Gordon recognized that not all children come to school with a rich internal music-listening repertoire; many are rarely encouraged to engage in musical conversations at home. Prompted by this reality and his research, he devised a method for music instructors to foster an environment where students listen, sing, and chant tonal and rhythmic patterns before they are expected to read and write music.[6] These activities help children build an internal library of songs, patterns, and music vocabulary. Eventually, as students start to read music notation or create compositions, they can rely on this acquired library to support their learning and creativity.

When considering language development, it is evident that children do not start by learning the alphabet when they begin to speak; instead, they learn to say words from what they hear in their environment. Listening to words and participating in conversations is essential for learning to speak and read. Similarly, in music education, active engagement with listening and singing is crucial for developing proficiency in reading and understanding music notation. Gordon emphasized the importance of consistently encouraging children to sing. This practice fosters a love for music and helps them refine their tonal audiation skills. By regularly engaging in singing, children develop the ability to sing in tune with accuracy and independence.[7] Exposing children to various tonal and rhythm patterns within songs and chants forms the foundation for cultivating a child's singing voice and music-listening vocabulary. When children

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[5] Gordon, "Taking a Look," 19.

[6] Diane M. Lange, *Together in Harmony: Combining Orff Schulwerk and Music Learning Theory* (Chicago, IL: GIA Publications, 2005), 19.

[7] Gordon, *Learning Sequences*, 266.

independently imitate the tonal and rhythm patterns they hear, they can confidently progress to reading and writing music with understanding.[8]

Audiation and Aural Skills

Gordon proposed that every individual possesses an innate music aptitude, determined by their ability to audiate. He drew parallels between the process of understanding language and comprehending music, suggesting that both involve a form of "thinking in sound."[9] This comparison to language development aids in understanding the stages of how children learn music. Just as language learning advances through distinct developmental vocabularies of listening, speaking, reading, and writing, a similar sequential progression can be applied to learning music.[10]

To clarify the process of learning music, Gordon recognized the need for a term that captures students' mental activities when they think about, hear, internally process, understand, and create music. Consequently, he introduced the term "audiation."[11] At the core of music learning is audiation, which involves mentally processing music or "hearing and comprehending music when the sound may or may not be physically present."[12] Gordon emphasized the fundamental role of audiation in music comprehension, likening it to the process of thinking while speaking. He described audiation as the ability to imagine and understand music mentally in the mind and then execute it with judgment. According to Gordon, "Without audiation of

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[8] Gordon, *Learning Sequences*, 5.

[9] Edwin E. Gordon, "All About Audiation and Music Aptitudes," *Music Educators Journal* 86, no. 2 (September 1999): 42, https://doi.org/10.2307/3399589.

[10] Ibid., 42.

[11] Ibid.

[12] Lange, *Together in Harmony*, 20.

context to serve as readiness for audiation of content, the sound remains simply as sound and not translated into music by the musical mind."[13]

Audiation is a cognitive process that involves thinking, comprehending, and translating sounds into music. Unlike simple note recognition, audiation entails internally hearing musical patterns. Gordon suggested that when children engage in audiation, they spontaneously improvise and organize music patterns within their minds.[14] He asserted, however, that audiation is attainable only through readiness, which starts with exposure to hearing and learning various songs in different tonalities and meters.[15] In his research, he acknowledged that many children entering preschool have had limited opportunities at home to develop a musical listening library, and thus, they need more readiness. Gordon emphasized the importance of music teachers addressing this gap by cultivating rich listening, singing, and chanting environments. Teachers who prioritize early listening and singing skills development will help students distinguish between speaking and singing voices, tonalities, and meters.[16]

In music education, audiation should be set apart from imitation or memorization. While imitation is essential for readiness, it does not involve the profound level of comprehension needed for audiation. Similarly, memorization lacks the depth of understanding required for audiation, such as recognizing tonality, meter, chord functions, and harmonic progressions. When students audiate, they think in sound and eventually gain the ability to anticipate what sounds may come next. The audiating process parallels having a conversation, where individuals

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[13] Edwin E. Gordon, *Roots of Music Learning Theory and Audiation* (Chicago, IL: GIA Publications, n.d.), Scholar Commons, https://scholarcommons.sc.edu/cgi/viewcontent.cgi?article=1000&context=gordon_articles.

[14] Lange, *Together in Harmony*, 20.

[15] Ibid.

[16] Gordon, "All About Audiation," 43.

can listen and think simultaneously, predicting responses. As conversations necessitate a rich speaking vocabulary, audiation requires children to possess a rich listening library encompassing various tonalities, meters, and styles. The more a child is exposed to hearing and singing various tonalities in different meters, the easier it becomes for them to audiate.

Music Aptitude

Music aptitude is a measure of the potential each child holds to learn music.[17] Gordon's research indicates that every child has the capacity to develop audiation skills, even though they may vary in terms of music aptitude.[18] Music aptitude is considered developmental until approximately age nine, after which research suggests it begins to stabilize. The period from birth to age nine is critical for children's music aptitude development.[19] The environment surrounding children profoundly impacts the growth of their aptitude; therefore, high-quality music instruction, coupled with consistent singing and listening experiences across various tonalities and meters, can enhance their music aptitude and, consequently, music achievement. Insufficient exposure to a rich musical environment during this developmental stage may contribute to a child's musical aptitude decline.[20] This understanding underscores the importance of recognizing the distinction between achievement and aptitude in music education.

While music achievement relates to what is learned and applied in music class, music aptitude represents children's inherent potential to acquire musical skills. Gordon distinguished

[17] Gordon, *Learning Sequences*, 44.

[18] Lange, *Together in Harmony*, 20.

[19] Edwin E. Gordon, "Music Aptitude and Related Tests: An Introduction," GIA Publications, Inc, accessed December 16, 2023, 5, https://giamusicassessment.com/pdfs/About%20Music%20Aptitude%20and%20Related%20Assessments.pdf.

[20] Ibid.

between the two, explaining that "aptitude" measures one's learning potential, while "achievement" measures what one has learned.[21] He contends that although children are born with varying degrees of music aptitude, they all possess the ability to listen to and perform music to some extent.[22]

The assertion that children possess varying degrees of music aptitude necessitates music educators to assess and understand each student's aptitude level. Educators should prioritize understanding and measuring their students' music aptitude before creating tailored instruction in audiation, performance, and music reading. Therefore, administering aptitude tests at least once per year becomes imperative. By administering valid music aptitude tests, teachers can identify individual aptitudes. The results should guide teacher instruction to ensure every student's musical potential is fully supported.[23]

Administering valid music aptitude and related tests enables music educators to assess students' musical potential and modify instruction to meet their needs. Analyzing test results and comparing data provide valuable insights for improving instruction. Longitudinal data analysis, primarily through assessments such as the Musical Aptitude Profile (MAP) testing, allows music educators to monitor the progression of students' aptitudes over time. This process provides critical information to inform teaching practices.[24] A decrease in a student's score compared to the previous year may indicate that their instructional needs have not been adequately addressed.

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[21] Edwin E. Gordon, *Primary Measures of Music Audiation: A Music Aptitude Test for Kindergarten and Primary Grade Children* (Chicago, IL: GIA Publications, Inc., 1979), 3.

[22] Ibid., 28.

[23] Edwin E. Gordon, "Aptitude and Audiation: A Healthy Duet," *Medical Problems of Performing Artists* 3, no. 1 (March 1988): 33, http://www.jstor.org/stable/45440648.

[24] Eric Bluestine, *The Ways Children Learn Music: An Introduction and Practical Guide to Music Learning Theory* (Chicago, IL: GIA Publications, 2000), 30.

Gordon developed five music aptitude tests tailored for specific age groups and developmental stages. These tests include three developmental assessments: Audie, designed for ages three through four; the Primary Measure of Musical Audiation (PMMA), for ages five through eight; and the Intermediate Measures of Music Audiation (IMMA), an advanced version of PMMA for ages six through nine.[25] There are two tests for stabilized music aptitude: the Musical Aptitude Profile (MAP) for children in grades four through twelve and the Advanced Measures of Music Audiation (AMMA) for college-aged students.[26]

Research indicates that exposing children to a rich musical environment during their formative years can profoundly impact their music aptitude scores. Gordon's research on children aged eight and nine demonstrated that specialized music instruction, which focused on creative improvisation and active participation techniques, significantly improved their music aptitude scores in a short period.[27] Similarly, Flohr conducted a twelve-week study comparing pre- and post-test PMMA scores for two groups of five-year-old children. One group received multiple vocal and instrumental improvisation opportunities, whereas the other followed a traditional instructional style. The results suggested that even a brief period of improvisatory instruction could significantly increase music aptitude scores.[28] These studies demonstrate that targeted instructional techniques can impact primary-aged children's developmental music aptitude scores within a relatively brief timeframe.

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[25] Robert A. Cutietta, "Edwin Gordon's Impact on the Field of Music Aptitude," *Visions of Research in Music Education* 16, no. 2 (Spring 1991): 75, http://www-usr.rider.edu/~vrme.

[26] Ibid., 74-75.

[27] Moore, "Toward a Theory," 22.

[28] John W. Flohr, "Short-Term Music Instruction and Young Children's Developmental Music Aptitude," *Journal of Research in Music Education* 29, no. 3 (Fall 1981): 221, https://doi.org/10.2307/3344995.

Whole-Parts-Whole

Gordon supported a whole-parts-whole approach to music instruction, which he believed was the most efficient and effective method to nurture students' learning processes. This approach ensures that instruction is efficient and individualized, engaging all students with varying aptitude levels. This method begins with presenting an overall view or model of the skills and tasks to be learned, typically through a piece of music. Specific skill development is targeted using tonal and rhythm pattern instruction, allowing students to echo and practice these elements. The lesson concludes by returning to the whole, where students apply what they have learned.[29]

A whole-parts-whole approach can be an effective strategy to use when teaching audiation. Instruction should begin by introducing the big picture or context by demonstrating songs and listening to music literature. Gordon calls this step "Classroom Activities," where students engage with music holistically through echo-singing, chanting, moving, dancing, creating, improvising, and, eventually, reading and writing music.[30]

Following the whole, tonal and rhythm patterns are introduced. This step involves focusing on the parts that comprise the whole. Tonal and rhythm patterns are introduced and practiced, allowing students to grasp various meters and tonalities. This instruction revolves around short tonal and rhythm patterns known as learning sequence activities (LSAs).[31] These LSAs are presented in a tiered order to develop students' audiation skills, enriching their tonal and rhythm vocabularies through singing and chanting specific patterns. Learning sequence

[29] Lange, *Together in Harmony*, 21.

[30] Gordon, *Learning Sequences*, 94.

[31] Lange, *Together in Harmony*, 21.

activities (LSAs) are implemented to reinforce what students learned during the whole instruction.[32] Ideally, these LSAs should only take about five minutes per class period.[33] In an instrumental setting, tonal patterns can serve as warm-ups where students are first directed to echo-sing select patterns introduced by the instructor, using a neutral syllable such as "bum," "loo," "too," or "doo." Later, they can advance to echo-singing patterns using solfège tonal syllables, develop the ability to recognize B flat as "do," and master melodies in different keys, tonalities, and meters.[34] As they progress, students can learn to finger the notes on their instruments while simultaneously singing the solfège syllables, note names, or lyrics, a technique known as "singering."

During the final stage of the whole-parts-whole process, students revisit the initial objective. Here, they are prompted to recognize and apply the patterns they have learned, thus deepening their understanding. Throughout this phase, students are encouraged to think in sound or audiate, moving beyond basic imitation. While imitation fulfills a practical role at first, it frequently involves looking and thinking backward, recalling what has recently been performed. In contrast, teaching students to audiate fosters forward thinking, enabling them to predict what will come next.[35] During audiation, students interpret what they hear by recalling and connecting with previously learned material.[36] In the pattern instruction phase of learning sequence activities, students demonstrate their understanding by singing and chanting specific tonal and rhythm

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[32] Lange, *Together in Harmony*, 33.

[33] Ibid., 21.

[34] Michael Norman, "Developing Thinking Musicians in Instrumental Music," in *The Development and Practical Application of Music Learning Theory*, ed. Maria Runfola and Cynthia Crump Taggart (Suffolk, VA: Boydell & Brewer, 2005), 205.

[35] Gordon, *Learning Sequences*, 10.

[36] Ibid., 5.

patterns. These activities promote recall, retention, and the ability to anticipate and predict the music they are learning. Table 1 outlines the three-stage process of implementing a whole-parts-whole approach in the classroom.[37]

Table 1. Whole-Parts-Whole Learning: Classroom Activities & LSAs

WHOLE	PARTS		WHOLE
Experience the Whole	Study the Parts		Experience the Whole with Increased Understanding and Comprehension
CLASSROOM ACTIVITIES	LEARNING SEQUENCE ACTIVITIES (LSAs)		CLASSROOM ACTIVITIES
Singing	Discrimination (Students Imitate)	Inference (Students Infer)	Singing
Chanting	Aural/Oral	Generalization Aural/Oral	Chanting
Moving and Dancing	Verbal Association	Generalization Verbal	Moving and Dancing
Playing Games	Partial Synthesis Reading and Writing	Creativity Improvisation	Playing Games
Instrument Performance	Symbolic Association	Generalization Symbolic	Instrument Performance
Creativity and Improvising	Composite Synthesis Reading and Writing	Theoretical Understanding	Creativity and Improvising
Reading and Writing Music			Reading and Writing Music

Source: Wendy Valerio, "The Gordon Approach: Music Learning Theory," Allianceamm, accessed November 29, 2023, https://www.allianceamm.org/resources/gordon/.

[37] Gordon, *Learning Sequences*, 23.

Skill Learning Sequence

The ability and readiness to audiate are fostered through a logical sequence of pattern instruction. Gordon categorized these levels as discrimination learning and inference learning.[38] Skill learning sequences should be methodically designed and implemented, beginning with LSAs focused on discrimination learning. Students imitate and memorize during this phase, often through a call-and-response format. During this process, students sing and chant tonal and rhythm patterns while the teacher prompts echoing. At the discriminatory level, students are aware of the instruction but may still be developing a full grasp of the musical concepts or rationale behind what they are learning.[39] Discriminatory learning involves rote learning, where the teacher provides answers to musical questions to develop readiness for inference learning.[40] This skill level aims to teach students to discriminate between pitches and durations, enabling them to hear the differences between sounds.[41]

As each student progresses to inference learning, teachers transition from providing direct instruction to guiding them through their learning process. Students start to make assumptions about unfamiliar music based on the knowledge gained during the discrimination stage.[42] Gordon contends that teachers cannot directly teach students to make inferences; instead, they act as facilitators, helping students apply discriminatory-level learning to inferential understanding.[43] At

[38] Gordon, *Learning Sequences*, 95.

[39] Ibid.

[40] Lange, *Together in Harmony*, 22.

[41] GIML, "Skill Learning Sequence," accessed November 19, 2023, https://giml.org/mlt/skilllearningsequence/.

[42] Ibid.

[43] Gordon, *Learning Sequences*, 96.

this stage, students move past rote learning and begin to make discoveries, identifying, creating, and improvising unfamiliar patterns based on their experiences with pattern instruction at the discriminatory level.

Gordon asserts, "When students perform without a listening vocabulary, poor intonation and rhythm, and worse, lack of musical expression and style [is] a result."[44] Therefore, it is essential to introduce learning skill sequences with varying tonal and rhythm pattern instruction levels. These patterns are the basic units of meaning in music and should continuously change with new experiences.[45] Each new level of knowledge learned integrates with the preceding one, creating a cohesive progression.[46] This sequential approach mirrors how children naturally learn music, fostering readiness that leads to audiation development.[47] The more tonal and rhythm patterns students learn and identify, the more equipped they will be to audiate patterns in different tonalities and meters.[48]

Following the MLT sequential process is crucial for music educators. Without proper readiness, expecting students to engage in inference levels before establishing the discrimination levels will only lead to frustration. Table 2 and Appendix J illustrate skill learning sequences' consecutive levels and sublevels. Created by Mullen and reflective of Gordon's research, this

[44] Gordon, *Learning Sequences*, 98.

[45] Ibid., 99.

[46] Ibid., 98.

[47] Ibid., 96.

[48] Ibid., 100.

table provides a clear view of the correct sequence for introducing tonal and rhythm patterns and facilitating discrimination and inference learning.[49]

Table 2. Gordon's Skill Learning Sequences: Levels & Sublevels (See also Appendix J)

Discrimination Learning	Inference Learning
• Students are taught, and they learn. • Information is acquired. • Familiar patterns. Familiar or unfamiliar order.	• Students are guided in how to teach themselves. • Students infer the unfamiliar on the basis of the familiar. • Familiar or unfamiliar patterns in unfamiliar order.
Aural/Oral • The most fundamental level of music. • Students listen and imitate. • Neutral syllables. • Students move to music.	**Generalization** • Students can identify if something is the same or different. • Students can translate patterns from a neutral syllable to solfège. • Students can identify familiar and unfamiliar harmonic and rhythmic functions. • Students can read familiar and unfamiliar music. • Students can identify the tonality or meter of an unfamiliar song.
Verbal Association • Students label the aural sounds from A/O. • Tonal and Rhythm Solfège is used to organize sounds. • Students label sounds with harmonic and rhythmic functions.	**Creativity/Improvisation** • Students can make up endings to songs. • Students can have tonal or rhythmic conversations. • Students can improvise over chord changes. • Students can compose their own music.
Partial Synthesis • Students are taught how to discriminate between contexts (tonalities and meters).	**Theoretical Understanding** • The "why" of music. • Students learn the "grammar" of music. • Students learn technical information (lines and spaces, letter names, types of cadences).

[49] Andy Mullen, "Gordon's Skill Learning Sequence: The 30,000 Foot View," The Improving Musician, last modified July 2, 2023, https://theimprovingmusician.com/gordons-skill-learning-sequence-the-30000-foot-view/.

Table 2. Continued, Gordon's Skill Learning Sequences: Levels & Sublevels

Discrimination Learning	Inference Learning
Symbolic Association • Reading at the word level. • Students learn to read the same patterns they were taught at the *Verbal Association* level.	
Composite Synthesis • Reading at the sentence level. • Reading with comprehension. • Students learn how to chain patterns together to read longer musical statements. • Students can recognize the tonality and meter of written music.	

Source: Andy Mullen, "Gordon's Skill Learning Sequence: The 30,000 Foot View," The Improving Musician, last modified July 2, 2023, https://theimprovingmusician.com/gordons-skill-learning-sequence-the-30000-foot-view/.

Tonal and Rhythm Pattern Instruction

Empirical evidence suggests that the human brain naturally seeks patterns, leading individuals to organize their surroundings by identifying patterns in speech and sound.[50] Interestingly, studies indicate that when people are introduced to individual musical elements, such as a single chord played in isolation, they struggle to identify them. However, when presented as part of a larger context, such as within a sequence of chords, people can recognize the individual chord more easily.[51] Patterns in music encompass more than just repetition; they involve a complex interplay of recurrence and change, generating expectations within the listener.[52] These expectations often lead to predictions about what will happen next in the music. This process relies on a balance between predictability, where elements remain consistent or

[50] Lora Doris, "Musical Pattern Perception," *College Music Symposium* 19, no. 1 (Spring 1979): 166, https://www.jstor.org/stable/40351765.

[51] Doris, "Musical Pattern Perception," 171.

[52] Ibid.

unchanged (sameness), and surprise, where elements deviate from the expected pattern (difference). By incorporating various levels of patterns into musical compositions, listeners can simultaneously perceive the expected repetitions and discern the unexpected variations.[53] This ability to recognize both the familiar and unfamiliar elements within a musical context enhances the richness of the listening experience and can deepen the listener's engagement with the music.

As listeners encounter diverse musical patterns and structures, their capacity for audiation is stimulated. This mental process of internalizing and comprehending music manifests differently among individuals. While some students may instinctively echo what they hear internally, others might focus on analyzing the meter or discerning the division of beats.[54] As the human brain naturally gravitates toward identifying similarities over differences, Gordon emphasizes the brain's reliance on stored pattern information, comparing it to what is heard in real-time.[55] He contends that a practical pedagogical approach requires guiding students to discern both differences and similarities.[56] This method is particularly significant in gradually instructing tonal and rhythmic patterns, nurturing students' capacity for independent audiation. Starting from pattern imitation, students progressively move toward independently identifying and comprehending similarities and differences. Ultimately, this sequential skill development empowers students to recognize patterns autonomously.[57]

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[53] Doris, "Musical Pattern Perception," 171.

[54] Jennifer Bailey, "Spiraling Instruction Using Music Learning Theory," *YouTube*, June 28, 2021, https://www.youtube.com/watch?v=JJ7h9GsXXus.

[55] Gordon, *Learning Sequences*, 101.

[56] Ibid.

[57] Ibid.

Developing Readiness for Instrumentalists

In traditional beginning band instruction, the process of learning to read music typically commences with the use of a method book. These books serve as foundational tools, guiding students through essential techniques such as instrument handling, symbol identification, note reading, and rhythmic counting. Historically, however, beginning band instruction has not emphasized the development of aural (listening) and oral (singing and chanting) skills. Instead, concepts like fingering charts, hand positions, breathing techniques, posture, embouchures, and articulations are introduced before exploring musical elements such as tonality, meter, and style.[58] While this traditional approach has long been regarded as adequate for teaching technical and physical readiness, it lacks a sequential framework centered around audiation and aural/oral development.

Incorporating music learning theory (MLT) elements through structured activities such as tonal and rhythmic pattern singing and chanting establishes a sequential approach. This sound-before-sight strategy emphasizes auditory skills before visual skills and effectively prepares beginning band students to read notation. Research indicates that prioritizing aural development over traditional notation instruction fosters connections between students' visual, auditory, and tactile senses, enriching their learning experience and yielding significant benefits.[59] Aural/oral skill development is most effectively supported through a sequential instructional method rooted in audiation.

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[58] Richard F. Grunow, "Music Learning Theory: A Catalyst for Change in Beginning Instrumental Music Instruction," in *The Development and Practical Application of Music Learning Theory*, ed. M. Runfola and C. Crump Taggart (Suffolk, VA: Boydell & Brewer, 2005), 181.

[59] Warren A. Haston, "Comparison of a Visual and an Aural Approach to Beginning Wind Instrument Instruction," (PhD diss., Northwestern University, 2004), 62, ProQuest, https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/dissertations-theses/comparison-visual-aural-approach-beginning-wind/docview/305136907/se-2 (305136907).

Audiation, often called the musical imagination or music of the mind, involves the ability to think music and comprehend melodies and rhythms without actual music.[60] This cognitive process constructs meaning and enhances children's comprehension of the music they listen to, perform, read, and write. Proficiency in reading music notation requires readiness and following a correct sequence, beginning with audiation skill instruction focusing on building a musical speaking vocabulary. Developing this vocabulary involves understanding and applying terms such as resting tone, macro and micro beats, tonal and rhythm patterns, tonalities, and meters.

Children's understanding of music relies heavily on perceiving tonal and rhythm patterns rather than isolated pitches or durations. Therefore, teaching these patterns is crucial for developing their contextual comprehension. Effective tonal pattern instruction usually involves patterns of two to five pitches, each with equal duration and without rhythm. Music instructors should be aware that pattern instruction can incorporate various combinations. For instance, major tonalities may include groupings of "do," "mi," and "sol," while harmonic minor tonalities may involve sequences of "la," "do," and "mi." When introducing rhythm patterns encompassing macro and micro beats, consistency in syllables, such as using "bum," along with vocal inflections for expression, is recommended. Teaching the tonal and rhythm sequences separately in different lessons is recommended to avoid confusion. Research indicates that combining tonal and rhythmic sequences might delay the student's ability to identify individual patterns accurately.[61]

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[60] Mary Ellen Pinzino, "Audiation - Another Way of Knowing," Come Children Sing, last modified 1994, 3, https://www.comechildrensing.com/pdf/selected_articles_music_teacher_page/1_Audiation--Another_Way_of_Knowing.pdf.

[61] Gordon, *Learning Sequences*, 101.

Historical Significance

Music instruction traditionally focuses on performance-based objectives, often emphasizing note-reading and rhythm skills. This emphasis is partly due to tight schedules and time constraints, leading many music educators to dedicate a significant portion of their instructional time to preparing concert repertoire. Gordon promoted an updated approach to traditional music education. He acknowledged the challenges of change, especially for educators who may find adopting new methods daunting and seemingly impossible; however, he urged music educators not to let fear or resistance to change hinder them from embracing new teaching methods. He encouraged them to explore the MLT teaching strategies that cultivate an understanding of the music rather than solely emphasizing technical proficiency and performance skills.[62]

Statement of the Problem

Audiation, the ability to think in sound, is a fundamental skill for musical understanding. It assists students to perform beyond mere note-playing. By fostering audiation skills, students can potentially learn and perform at a more mature musical level. American music education has a well-established tradition of emphasizing visual and technical learning over audiation skills, especially in the initial stages of band instruction.[63] Most beginning band method books overlook the significance of fostering aural/oral skills through listening and singing. Instead, they often

[62] Edwin Gordon, *Essential Preparation for Beginning Instrumental Music Instruction* (Chicago: GIA Publications, 2010), vii.

[63] Joshua E. Kohl, "Improving Sight-Reading Through Beginning Band Instruction," (master's thesis, Liberty University, 2021), 2, https://digitalcommons.liberty.edu/cgi/viewcontent.cgi?article=1771&context=masters.

bypass the preparation required for formal music notation instruction.[64] Students are initially immersed in technical aspects, musical terms, and visual symbols, emphasizing the identification of notes on a music staff and how they are fingered over how they should sound.[65] This approach limits opportunities for aural/oral activities essential for nurturing audiation skills.

The problem of this study was to discover whether applying aural/oral strategies, such as listening, chanting, singing, using solfège hand signing, and "singering" to beginning band instruction, could help students develop audiation skills. It was hypothesized that the development of audiation would correlate with higher music aptitude and music achievement post-test scores. This quantitative experimental design compared post-test data gathered from the administration of the Intermediate Measure of Music Audiation Tonal Subtest (IMMA TS), Iowa Tests of Music Literacy Tonal Concepts Audiation/ Listening Subtest (ITML T1), and Iowa Tests of Music Literacy Tonal Concepts Audiation/Reading Subtest (ITML T2) for two distinct instructional strategies.

The study comprised two groups of fourth and fifth-grade beginning band students. The control group (n = 21) followed traditional instruction employing the beginning band method book, *Standard of Excellence: Comprehensive Band Method: Book One*.[66] The experimental group (n = 22) was guided by nontraditional music learning theory (MLT) principles, emphasizing the development of audiation skills. This approach prioritized auditory skill

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[64] Alan Danahy, "Comparative Audiation Difficulty of Tonal, Rhythm, and Melodic Patterns Among Grade 4 Students," (master's thesis, University of South Carolina - Columbia, 2013), 3, https://scholarcommons.sc.edu/etd/2564.

[65] Haston, "Beginning Wind Instrument Instruction," 11.

[66] Bruce Pearson, *Standard of Excellence: Comprehensive Band Method: Book One* (San Diego, CA: Neil a Kjos Music Company, 1996), 1.

development through activities such as listening, chanting, singing, solfège hand signing, and "singering" before introducing note reading.

Statement of the Purpose

The purpose of this quantitative experimental study was to examine the impact of two differing instructional strategies on beginning band instruction. One approach adhered to a traditional method emphasizing technical proficiency and note-reading skills, whereas the other prioritized aural skill development through listening, chanting, singing, solfège signing, and "singering" techniques. Post-test scores of the IMMA Tonal Subtest (TS), the ITML for Audiation/Listening (T1), and the ITML for Audiation/Reading (T2) were analyzed to assess the effectiveness of each instructional approach in enhancing students' musical aptitude and achievement.

Significance of the Study

Most beginner band method books and teaching methods prioritize the mechanical and technical aspects of playing an instrument. Students typically learn to identify notes, rests, symbols, and terms while mastering essential skills like correctly holding the instrument, counting, breathing, and articulating. Although research supports the positive effect aural/oral training has on instrumental instruction, beginning band instructors rarely include audiation skill development within their instructional strategies.[67]

[67] Patricia A. Grutzmacher, "The Effect of Tonal Pattern Training on the Aural Perception, Reading Recognition and Melodic Sight-Reading Achievement of First Year Instrumental Music Students," (PhD diss., Kent State University, 1985), 9, https://www.proquest.com/openview/43332a85615630b33b4e75c924b5fffa/1?pq-origsite=gscholar&cbl=18750&diss=y (8514172).

The instructional method investigated in this experimental study was a sound-before-sight approach in beginning band lessons. This approach was applied to a treatment group to evaluate the potential influence of vocalization techniques on the enhancement of audiation skills within music aptitude and music achievement post-test scores. Following Gordon's perspective, the researcher employed listening and singing activities as a foundational learning platform before introducing note instruction. This experiment was designed to foster audiation skills through an enjoyable aesthetic experience of chanting, singing, and "singering." The outcomes of this experiment aimed to investigate whether there would be significant differences in the mean scores of the IMMA TS, ITML T1, and ITML T2 standardized music audiation tests between the experimental group, based on MLT principles, and the control group, based on traditional instructional practices.[68]

While aural instruction has not been customary in American beginning band programs, there is a widely held belief in the effectiveness of singing and chanting during instruction.[69] However, changing established philosophies and strategies poses a complex challenge. Overcoming deeply ingrained traditional norms in instrumental teaching demands a forward-thinking approach. This transformation necessitates educators to adopt innovative teaching methods that prioritize aural development, requiring them to be aware of the need to reassess their instructional practices and potential limitations. Understanding specific reasons contributing

[68] Gordon, *Essential Preparation*, 109.

[69] Michael P. Dunlap, "The Effects of Singing and Solmization Training on the Musical Achievement of Beginning Fifth-Grade Instrumental Students," (PhD diss., University of Michigan, 1989), 2, In PROQUESTMS ProQuest Dissertations & Theses Global (No. 9013890), https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/dissertations-theses/effects-singing-solmization-training-on-musical/docview/303811021/se-2.

to their reluctance to utilize vocalization techniques may help them make informed changes. These factors include:

1. Instructor Tradition: Many instructors continue to teach in the same manner they were taught.
2. Time Constraints: Limited time can make incorporating additional teaching strategies challenging.
3. Perceived Effectiveness: Instructors commonly believe their current techniques are highly effective.
4. Lack of Confidence: Some instructors feel uncertain about integrating singing into their instruction easily.[70]

Overall, the customary teaching approach remains rooted in tradition, with instructors confident in the efficacy of their existing methods.[71] Therefore, building upon this insight, it is imperative to bring awareness to beginning band instructors of the importance of sequential development and how early exposure to singing and listening is foundational to music acquisition and comprehension. Before introducing note reading, beginning band instruction should methodically introduce listening and singing exercises. This deliberate approach will foster students' ability to audiate and enable them to comprehend and connect with the music they play. As a result, student instrumentalists who audiate will exhibit greater tonal precision, rhythmic accuracy, and sensitivity in their performances. The significance and relevance of this focus on sequential development in music acquisition is underscored by the potential benefits it can bring to the learning process, as demonstrated in this study.

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[70] Dunlap, "The Effects of Singing," 12.

[71] Ibid.

Research Question and Hypotheses

Beginning band instruction and method books have traditionally overlooked the employment of listening and singing (aural/oral) activities during teaching and learning. Many beginning band programs focus on developing technical, rhythm-reading, and note-reading skills in preparation for upcoming performances. This oversight implies a need for instrumental music educators to become aware of the benefits of adopting instructional strategies for intentionally developing listening and singing skills in a beginning band program. Therefore, this study involved a post-test strategy for two randomly divided groups of beginning band students. Both groups learned the same notes and melodies; however, the control group was instructed with a traditional note-reading method, while the experimental group learned by using a sound-before-sight strategy that engaged students in listening and singing activities before reading their first notes. This quantitative experimental study investigated the impact of vocalization strategies on student music aptitude and tonal achievement. The following research questions guided the study:

RQ1: Is there a difference in Intermediate Measures of Music Audiation – Tonal Subtest (IMMA TS) music aptitude post-subtest scores between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

RQ2: Is there a difference in Level 1—Audiation/Listening—Tonal Aural (T1) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

RQ3: Is there a difference in Level 1—Audiation/Reading—Tonal Reading (T2) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

$H_0$1: There is no difference in Intermediate Measures of Music Audiation – Tonal Subtest (IMMA TS) music aptitude post-subtest scores between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices).

$H_0$2: There is no difference in Level 1—Audiation/Listening—Tonal Aural (T1) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices).

$H_0$3: There is no difference in Level 1—Audiation/Reading—Tonal Reading (T2) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices).

Definition of Terms

Audiation is the foundation of musicianship. It occurs when students can hear and comprehend music in their heads without the sound present. This cognitive process gives meaning to musical sounds and is equivalent to thinking internally about what is to be said.[72]

[72] Gordon, "Audiation," 4.

Aural/oral learning involves hearing (aural) through the ear and producing sound (oral) through speech or singing. The teacher sings or chants a pattern, and the students listen (aural) and repeat it (oral). This approach is essential in music learning theory procedures and is foundational for teaching students to hear the music before they learn to read it.

Intermediate Measures of Music Audiation (IMMA) are standardized rhythm and tonal music aptitude tests developed by Edwin E. Gordon. The tests aim to identify individual music aptitudes and assess strengths and weaknesses in tonal and rhythm identification. The data from these tests enables music teachers to customize their instruction according to each child's specific needs.[73]

Music aptitude measures the potential each child holds to learn music.[74] Gordon's research revealed that every child is born with the capacity to develop audiation skills and is equipped with a unique level of aptitude.[75]

Music learning theory (MLT), developed by Gordon, is a research-based framework that provides instructors with a comprehensive and sequential plan for developing audiation skills—the ability to mentally hear and comprehend music. Music learning theory emphasizes a structured approach to music education, focusing on auditory learning and the development of inner hearing. It supports instructors in systematically guiding students through various musical understanding and proficiency stages.[76]

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[73] Edwin E. Gordon, "Intermediate Measures of Music Audiation (Grades 1-6) - Test Manual," GIA Publications Inc., accessed August 6, 2023, https://www.giamusic.com/store/resource/intermediate-measures-of-music-audiation-grades-16-test-manual-book-g2593m.

[74] Gordon, *Learning Sequences,* 44.

[75] Lange, *Together in Harmony*, 20.

[76] Christopher Azzara, "Audiation, Improvisation, and Music Learning Theory," *The Quarterly* 16, no. 2 (Spring 1991): 106, http://www-usr.rider.edu/~vrme/v16n1/volume2/visions/spring12.

Sight-reading involves reading and kinesthetic skills. Performers must scan unfamiliar music and accurately determine how to play the notation. The performer must also have proper finger placement to play the notes accurately.[77]

Singering involves fingering a musical note on an instrument and simultaneously singing its pitch using solfège or the note name rather than solely playing it.

Sound-before-sight or *sound-before-symbol* refers to learning music experientially through aural instruction. Listening, echoing, and playing by ear are employed before visually learning to read music notation.

The *Iowa Tests of Music Literacy (ITML)* are standardized assessments designed to evaluate students' musical development over time, pinpoint strengths and weaknesses, and measure their progress in music achievement relative to others.[78]

This study uses the terms *researcher* and *teacher* interchangeably, referring to the same individual who conducted the instructional interventions. This approach was maintained to ensure consistency in instructional methods and closely monitor the implementation of experimental and control treatments.

Tonal and rhythmic patterns are the building blocks of musical language within MLT instruction. They are taught logically and sequentially to foster musical comprehension and

[77] H. C. Bernhard, "The Effects of Tonal Training on the Melodic Ear Playing and Sight-Reading Achievement of Beginning Wind Instrumentalists," (PhD diss., The University of North Carolina at Greensboro, 2003), 13, ProQuest Dissertations Publishing (No. 3093857), https://www.proquest.com/openview/f81a81dde97e104f210f5624f6bf4ac2/1?pq-origsite=gscholar&cbl=18750&diss=y.

[78] Edwin E. Gordon, "GIA Publications - Iowa Tests of Music Literacy - Test Manual," GIA Publishers Inc, accessed August 6, 2023, https://www.giamusic.com/store/resource/iowa-tests-of-music-literacy-test-manual-book-g3636m#:~:text=All%20six%20levels%20are%20organized,for%20Grades%207%20through%2012.

enhance audiation skills.[79] These patterns must be taught separately to establish clarity and avoid confusion.[80]

Summary

Teaching beginning band students to hear, sing, and play melodies and rhythms before receiving notation instruction is a nontraditional approach to development. Aural skills in instrumental instruction can develop tonal understanding and improve sight-reading skills, rhythmic accuracy, intonation, and overall musicality.[81] Gordon, an admirable teacher, researcher, writer, and lecturer, was convinced that "[a]ll learning begins with the ear and not the eye."[82] Through developing music learning theory (MLT), Gordon passionately contributed ideas and revelations on audiation and the sequential process of music acquisition involving tonal and rhythmic pattern instruction. He hoped to awaken music educators to become more concerned about "how" students learn before focusing on "what" students should learn.[83] His main objective in illuminating the MLT structure was to encourage teachers to become better at what they are doing, to research and reflect on "what should be learned, when it should be learned, and why it

[79] Gretchen Beall, "Learning Sequences and Music Learning," *The Quarterly* 16, no. 2 (Spring 1991): 90, http://www-usr.rider.edu/~vrme/v16n1/volume2/visions/spring10.

[80] GIML, "Frequently Asked Questions – GIML – The Gordon Institute for Music Learning," accessed June 6, 2023, https://giml.org/resources/faq/#:~:text=By%20spending%20some%20instructional%20time,Not%20at%20all.

[81] Bernhard, "The Effects of Tonal Training," 79.

[82] Gordon, *Learning Sequences*, 26.

[83] Ibid., xiii.

should be learned."[84] He also aimed to encourage instructors to challenge customary ways of teaching.

Music learning theory (MLT) is not a teaching method but a framework to build comprehension and understanding of music concepts. It is a tool for planning student readiness and tailoring instruction to accommodate diverse skill levels. Gordon encouraged music instructors to refrain from being concerned about replacing their content with MLT but instead incorporate MLT concepts into their successful strategies. He advised them to consider how their content aligns with the sequential order of MLT. This thoughtful planning will focus on lesson objectives, making them more purposeful, efficient, and logical.[85] Adopting MLT principles and audiation practices starts with allowing students to experience the music before attributing symbols to the sounds they hear.[86]

Though uncommon in instrumental education, embracing a sound-before-sight approach can transform a beginning band program. This method enables students to develop a deeper understanding of the music they hear, perform, and eventually read and write. Prioritizing listening and singing activities during instruction allows students to build their audiation skills, laying the foundation for becoming independent musicians who can engage with music more proficiently, meaningfully, and expressively.[87]

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[84] Michael L. Mark and Patrice Madura, *Contemporary Music Education* (Boston, MA: Cengage Learning, 2014), 123.

[85] Robert Harper, "Frequently Asked Questions about Music Learning Theory," *General Music Today* 8, no. 2 (Winter 1995): 12, https://doi.org/10.1177/104837139500800204.

[86] Jennifer Ausman, "Sound Before Symbol Strategies and Beginning Band Performance Skills," *Canadian Journal for New Scholars in Education* 13, no. 2 (Fall 2022): 103, https://journalhosting.ucalgary.ca/index.php/cjnse/article/view/75284/56372.

[87] Bluestine, *The Ways Children Learn Music*, xiii.

Chapter Two: Literature Review

Introduction

This chapter reviews the literature relevant to a sound-before-symbol philosophical perspective and instructional approach in music education. Understanding the history, principles, and purpose of an aural/oral teaching approach will provide valuable insights into the design, methodology, and execution of this experimental research study. By examining previous research on a sound-before-sight philosophy in beginning band instruction, the researcher sought to uncover a gap in the literature regarding employing an aural/oral instructional approach. Although vocalization techniques have been recognized as beneficial for beginning band instruction, they are not commonly included in the method books used in instrumental education. As a result, most band directors do not attempt to incorporate these techniques into their instructional strategies.

This review is grounded in the theoretical frameworks of Johann Pestalozzi and Edwin Gordon. Pestalozzi's foundational role in sound-before-symbol methodologies and emphasis on experiential learning provides insights into the benefits of employing an aural approach in a beginning band setting. Furthermore, Gordon's research and development of music learning theory (MLT) and audiation have enriched this review with insights into how integrating listening and singing techniques, rather than relying solely on visual symbol instruction, can augment children's musical comprehension and performance skills. The review aims to discover how Pestalozzi's sound-before-symbol philosophy and Gordon's MLT and aural skill development concepts can offer complementary perspectives for implementation in a beginning band setting.

The initial section of this chapter focuses on the pioneering contributions of Johann Pestalozzi, alongside other notable educational theorists such as Robert Gagné and Jerome Bruner. These scholars have formulated educational, psychological, and behavioral theories centered on understanding children's learning processes and have proposed strategies for improving instructional design. Their understanding of sequential learning significantly influenced Gordon, shaping his beliefs about how children learn when they learn music. Pestalozzi, Gagné, and Bruner, each contributing uniquely to the development of music learning theory, served as inspirational figures. Their perspectives confirmed the efficacy of a sound-before-symbol sequential approach in helping children understand, think about, sing, and perform music.

In addition, the first section of this review includes an overview of the establishment of music education in the United States, led by the influential music educator and composer Lowell Mason. Additionally, the text explores the educational methodologies that Orff, Kodály, and Suzuki endorsed, providing insights into their philosophies regarding the parallels between music learning and children's natural language acquisition process. Their methodologies, rooted in sequential instruction, are deeply influenced by the Pestalozzian principle of sound-before-symbol. At the core of their teaching approach is acknowledging that listening, imitation, and vocalizing are fundamental prerequisites for children to grasp as they learn to play music. Each educator promoted learning through sound before symbols, advocating it as a more natural and intuitive instructional method.

Edwin Gordon and his MLT are introduced in the second part of this chapter. Gordon's empirical research focused on music aptitude, audiation, and how children learn when they learn music. He offered valuable insights into the innate abilities, cognitive processes, and

developmental pathways that underlie music learning and comprehension. His investigative journey revealed the significance of audiation, the mental process of comprehending and internalizing music, in fostering the development of music skills, understanding, and literacy. Drawing insights from Pestalozzi, Bruner, and Gagné, Gordon structured a music learning theory that employs cognitive and practical aspects of sequential music instruction, including music aptitude, audiation, learning sequences, and improvisation. By incorporating Gordon's research, educators can skillfully design personalized instructional strategies for beginning band students, nurturing musical intelligence, sensitivity, expressiveness, appreciation, and understanding.

The concluding section of this review explores researched instructional techniques designed to assist beginning band instructors in developing curricular objectives aimed at improving audiation skills through the Pestalozzian and Gordian sound-before-symbol philosophies. Exploring practical listening and vocalizing strategies reveals how beginning band instructors can seamlessly implement this unconventional approach while staying true to their pedagogical preferences and beliefs. These techniques demonstrate how prioritizing the development of auditory perception and internalization of musical concepts before introducing symbolic notation allows students to grasp the essence of music through listening and imitation, laying a solid foundation for later learning and understanding of musical notation.

The educational approaches of theorists Lowell Mason, Edwin Gordon, Carl Orff, Zoltán Kodály, and Shinichi Suzuki are explored within this chapter to understand how each incorporates the Pestalozzian sound-before-symbol methodology into their distinctive music learning strategies. Their writings and teachings imply that they support this approach as a fundamental framework for fostering essential music skills like reading proficiency, fluency in

playing, sensitivity to music, and accurate intonation. A fundamental commonality across their methodologies is prioritizing developing skills through sequential learning processes.

By synthesizing existing research, this literature review sought to validate the effectiveness of focusing on auditory learning before introducing symbolic notation. Additionally, the review underscores the pedagogical significance of historical and theoretical foundations in shaping modern music education practices. Over the past century and a half, music education has primarily focused on performance skills rather than fostering deeper musical understanding.[1] Recognizing this historical context allows instrumental instructors to understand why vocalization techniques have been underutilized in beginning band instruction. This insight prompts reevaluating traditional approaches, encouraging instructors to bridge the gap by integrating vocalization techniques into instrumental teaching.

Theoretical Framework – Johann Pestalozzi

According to Claxton and Dolan, a theoretical framework is a structure to support and outline the research process.[2] Because theories are heavily researched, they offer a credible and specific lens to guide the researcher and illuminate the research.[3] Grant and Osanloo compared the theoretical framework to a home's blueprint, noting that a homeowner would not consider

[1] Arthur Efland, "Art and Music in the Pestalozzian Tradition," *Journal of Research in Music Education* 31, no. 3 (Fall 1983): 167, https://doi.org/10.2307/3345170.

[2] Bunnie L. Claxton and Carol Dolan, *Step-by-Step Guide to Writing a Literature Review for Doctoral Research* (Dubuque, IA: Kendall Hunt Publishing, 2022), 32.

[3] Scott Reeves et al., "Why Use Theories in Qualitative Research?," *BMJ* 337, no. 337 (August 2008): 1, https://doi.org/10.1136/bmj.a949.

building a house without initially designing a solid blueprint.[4] Careful selection of a theoretical framework is essential to sound research.[5] Researchers who establish a theoretical framework at the beginning of their study ensure that the structure, organization, and flow are evident throughout their work.[6]

This literature review is built upon the theoretical framework of Pestalozzian educational theory, which promotes an instructional approach that aligns with the natural development of children.[7] This framework emphasizes a sequential progression from simple to complex and concrete to abstract content. Pestalozzi observed that starting instruction with familiar concepts enables students to comprehend and build new knowledge more efficiently.[8] He recognized the advantages of using a sound-before-symbol approach in music education and proposed that educational instruction begin by aligning with children's natural development and interests.[9] Engaging students in enjoyable subjects encourages active participation and enthusiasm for learning, leading to a deeper understanding and appreciation of the material. Furthermore, aligning instruction with student interests promotes a student-centered approach to education,

[4] Cynthia Grant and Azadeh Osanloo, "Understanding, Selecting, and Integrating a Theoretical Framework in Dissertation Research: Creating the Blueprint for Your House," *Administrative Issues Journal: Connecting Education, Practice, and Research* 4, no. 2 (January 2014): 12, https://doi.org/10.5929/2014.4.2.9.

[5] Ibid., 14.

[6] Ibid., 13.

[7] "Johann Pestalozzi (1746–1827) Career and Development of Educational Theory, Diffusion of Educational Ideas," Education Encyclopedia, accessed May 5, 2023, https://education.stateuniversity.com/pages/2319/Pestalozzi-Johann-1746-1827.html.

[8] Gabriel Compayré, *Pestalozzi and Elementary Education* (New York, NY: T. Y. Crowell and Company, 1907), 70, https://books.google.com/books?id=H4wWAAAAIAAJ&printsec=frontcover#v=onepage&q&f=false.

[9] Maria Laubach and Joan K. Smith, "Educating with Heart, Head, and Hands: Pestalozzianism, Women Seminaries, and the Spread of Progressive Ideas in Indian Territory," *American Educational History Journal* 38, no. 1 (n.d.), 343, https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/scholarly-journals/educating-with-heart-head-hands-pestalozzianism/docview/1034734650/se-2.

facilitating learners to actively shape their learning experiences and contribute to their overall development.

Pestalozzi believed in following a sequential method that builds comprehension step-by-step, advancing only once the subject material is well understood.[10] His instructional approach emphasized learning through listening, imitating, active participation, and sensory engagement. He advocated for a sound-before-symbol approach in music education, prioritizing listening and singing over instruction focused solely on note-reading. Individualized instruction, hands-on learning, developing critical thinking skills, and a holistic learning style were foundational aspects of Pestalozzi's educational approach. Furthermore, Pestalozzi believed that education and learning should engage the head, heart, and hands, where cognitive, affective, and psychomotor domains are recognized and considered.[11]

Pestalozzi's educational theory gained popularity in Europe around 1800 following his book *How Gertrude Teaches Her Children*.[12] This collection of letters and essays, containing personal reflections, pedagogical instruction, and educational theory, contributed to recognizing Pestalozzi's ideas in the mainstream.[13] Pestalozzi was interested in child development and psychology. His instructional strategies on language were based on the sequential principles of sound, words, and language.[14] In Pestalozzi's system, the art of teaching involved an expectation

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[10] Laubach and Smith, "Educating with Heart," 343.

[11] Senka Gazibara, "Head, Heart, and Hands Learning - A challenge for contemporary education," *Journal of Education Culture and Society* 4, no. 1 (January 2020): 71, https://doi.org/10.15503/jecs20131.71.82.

[12] Johann H. Pestalozzi, *How Gertrude Teaches Her Children: An Attempt to Help Mothers to Teach Their Own Children and an Account of the Method* (Syracuse, NY: Swan Sonnenschein & Co., 1894), xxxiii, https://ia803408.us.archive.org/1/items/howgertrudeteach00pestuoft/howgertrudeteach00pestuoft.pdf.

[13] John A. Green, *The Educational Ideas of Pestalozzi* (London: University Correspondence College Press, 1905), 167, https://books.google.com/books?id=wI0WAAAAIAAJ&printsec=frontcover&source=gbs_ge_summ.

[14] Pestalozzi, *How Gertrude Teaches*, xxxiii.

that children should gain knowledge through observing, listening, and questioning their environment. He slowly introduced information to his students in a way that encouraged them to think about and interact actively with their surroundings.[15] The Pestalozzian method and ideas spread across Europe and eventually reached the United States through the teachers he trained and educators who admired his approach, thus expanding his international influence.

Pestalozzi's educational theory was greatly influenced by philosopher Jean-Jacques Rousseau's belief that education should be aligned with children's natural development and interests.[16] Building on this philosophy, Pestalozzi asserted that a child's language acquisition begins with hearing rather than writing. Consequently, he promoted teaching music first by singing songs before introducing notation.[17] Implemented gradually, Pestalozzi's sound-before-symbol approach introduced students to one concept at a time. He emphasized allowing ample time for practice and mastery of each concept before advancing.[18]

Respected theorists and music instructors embraced Pestalozzi's hierarchical and sequential sound-before-symbol approach. This practice reflects the philosophies of prominent

[15] Pestalozzi, *How Gertrude Teaches*, xlvii.

[16] Johann Heinrich Pestalozzi, "Research Begins Here - New World Encyclopedia," accessed May 5, 2023, https://www.newworldencyclopedia.org/entry/Johann_Heinrich_Pestalozzi.

[17] Ryan Bunch, "Pestalozzi and Music Education," accessed April 19, 2023, https://www.ryanbunch.com/2018/09/pestalozzi-and-music-education.html.

[18] Mallorie Chernin, "A Practical Application of an Eighteenth-Century Aesthetic: The Development of Pestalozzian Education," *College Music Symposium* 26 (1986): 61, https://www.jstor.org/stable/40373822.

music educators, including Lowell Mason,[19] Zoltan Kodály,[20] Carl Orff, [21] Shinichi Suzuki,[22] John Curwen,[23] Emile Jaques-Dalcroze,[24] and Edwin Gordon.[25] Additionally, Pestalozzi's educational practices impacted the theoretical developments of American educational psychologists Robert Gagné and Jerome Bruner. Gagné's conditions of learning theory transformed education by emphasizing the importance of designing instruction around children's developmental stages and levels of learning.[26] Bruner's theory of cognitive development suggests that children learn primarily through hands-on experiences and interaction with their environment. Building upon the Pestalozzian theory, Bruner emphasized the influential roles of culture and language in shaping children's understanding of the world. He proposed that learning occurs cyclically, with children continuously revisiting basic concepts at increasingly advanced levels as they mature. Pestalozzi's foundational principle of sound-before-symbol influenced Gagné and Bruner's philosophies, which focused on understanding children's learning processes and the significance of developmental stages. These theories, in turn, inspired Edwin Gordon's insights into

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[19] Efland, "Art and Music in the Pestalozzian Tradition," 165.

[20] Livera Hussey, "The Kodály Method: A Vocal Approach to Music Education," (thesis, Pembroke State University, 1989), 37, https://libres.uncg.edu/ir/uncp/f/Livera%20Hussey.

[21] Rudi J. Dick, "An Investigation of the Educational Influences on the Kodály Approach to Music Education," (master's thesis, University of Manitoba, 1996), 47, https://mspace.lib.umanitoba.ca/bitstream/handle/1993/19195/Dick_An_investigation.pdf?sequence=1.

[22] Karin S. Hendricks, "The Philosophy of Shinichi Suzuki: Music Education as Love Education," *Philosophy of Music Education Review* 19, no. 2 (October 2011): 137, https://doi.org/10.2979/philmusieducrevi.19.2.136.

[23] Ibid., 48.

[24] David R. J. Frego, "The Approach of Emile Jaques-Dalcroze," Allianceamm, accessed April 19, 2023, https://www.allianceamm.org/resources/dalcroze/.

[25] Bluestine, *The Ways Children Learn Music*, 35.

[26] Joyce Jordan-DeCarbo, "A Sound-to-Symbol Approach to Learning Music," *Music Educators Journal* 72, no. 6 (February 1986): 34, https://doi.org/10.2307/3401275.

sequential learning within music education, playing a crucial role in developing his music learning theory and a sound-before-symbol approach to music instruction.

Theorists Influenced by Pestalozzi

Robert Gagné

Robert Gagné, an American educational psychologist, gained notoriety for his conditions of learning theory. His research revealed that critical needs must be met for learning, asserting that new learning should be introduced by applying it to prior knowledge.[27] This sequential learning process prioritizes student understanding over memorization.[28] Gagné's conditions of learning are based on the categorization of learning outcomes into five domains: (a) intellectual skills, (b) verbal information, (c) cognitive strategies, (d) motor skills, and (e) attitudes.[29]

Building upon these conditions of learning, Gagné developed a nine-step process to guide educators in engaging learners and improving information retention. These steps are divided into three sections: (a) preparation, (b) instruction and practice, and (c) assessment and transfer.[30] Gagné's domains and nine-step process offer a structured framework relevant to music instruction. A systematic teaching approach ensures students receive the essential support and guidance to succeed as they transition into independent learners.

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[27] Serhat Kurt, "Robert Gagné's Taxonomy of Learning," Educational Technology, last modified January 4, 2021, https://educationaltechnology.net/robert-gagnes-taxonomy-of-learning/.

[28] Kayvan Khadjooi, Kamran Rostami, and Sauid Ishaq, "How to use Gagné's Model of Instructional Design in Teaching Psychomotor Skills," *Gastroenterology and Hepatology from Bed to Bench* 4, no. 3 (Summer 2011): 119, https://pubmed.ncbi.nlm.nih.gov/24834168/.

[29] Robert L. Hohn, "An Educational Psychologist Considers the Work of Edwin Gordon," *Visions of Research in Music Education* 16, no. 5 (2021): 13, https://opencommons.uconn.edu/vrme/vol16/iss2/5.

[30] "Gagné's Nine Events of Instruction - Conditions of Learning," The Peak Performance Center - Performance Excellence, last modified July 4, 2014, https://thepeakperformancecenter.com/business/learning/business-training/gagnes-nine-events-instruction/.

Jerome Bruner

Jerome Bruner, an influential American psychologist and educator of the twentieth century, emphasized that successful learning follows a specific protocol.[31] He asserted that children could learn any material as long as it was approached at their level of development.[32] Through his research, he conceived that instruction should be organized in a spiraling system, with the curriculum reviewed frequently and taught with gradually increasing difficulty.[33] This spiraling process addresses the needs of all students regardless of their stage of development.[34]

Following Pestalozzi's principles, Bruner stressed that education should sequentially guide children, teaching them problem-solving and knowledge-construction skills that can be applied across various learning situations.[35] With this understanding, Bruner developed a cognitive learning theory based on three modes of representation to describe the way information is encoded and stored in memory: (a) enactive (action/experience), (b) iconic (picture representations), and (c) symbolic (notation).[36]

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[31] Carolyn Neumann, "The Kodály Method and Learning Theories," *The Canadian Music Educator* 47, no. 4 (Summer 2006): 49, https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/scholarly-journals/kodály-method-learning-theories/docview/1026918424/se-2.

[32] Ricardo D. Freire and Sandra F. Freire, "Towards a Theory of Music Instruction: A Dialogue Between Jerome Bruner and Edwin Gordon" (Conference session presented at 28th International Society for Music Education World Conference, Bologna Italy, 2008), 2.

[33] Neumann, "The Kodály Method," 49.

[34] Ibid.

[35] Saul McLeod, "Jerome Bruner's Constructivist Theory of Learning and Cognitive Development," Simply Psychology, last modified April 21, 2023, https://www.simplypsychology.org/bruner.html#:~:text=Bruner%20argues%20that%20language%20can,%E2%80%9Chere%20%26%20now%E2%80%9D%20concept.

[36] Carol Krueger and Jill Wilson, "Foundations of Music Literacy: Jerome Bruner's Contributions to Choral Music Education," *Choral Journal* 59, no. 1 (August 2018): 20, https://search.ebscohost.com/login.aspx?direct=true&db=asn&AN=130528889&site=ehost-live&scope=site.

When teaching children to read, it is crucial for them to first engage in experiential activities where they can physically interact with and manipulate written words before exploring their abstract representations. Bruner's theory, which suggests that learning should begin with concrete experiences before moving to abstract understanding, aligns well with the Pestalozzian and Gordian sound-before-sight approach in music instruction. Following this sequential framework, beginning band instructors should prioritize building audiation skills and music understanding through skill learning sequences. Once students have demonstrated their ability to audiate tonal and rhythmic note patterns, they can advance to the symbolic level. At this stage, students have internalized the symbols and their meanings to the extent that they can quickly identify notes without thinking about each separately. This fluency in reading notation demonstrates understanding and allows for smoother and more efficient music interpretation and performance.

Review of Literature

History of American Music Education

Rote Versus Note Controversy

The historical development of American music education can be traced back to the colonial period when songs were primarily transmitted orally with minimal accompaniment.[37] Due to this aural tradition, songbooks with meter, key, and melody lines were not readily accessible. During this era, music education was considered a privilege reserved for the elite and was largely absent from the formal educational system. Instead, music flourished through

[37] Katie Farrer, "'Sing to the Lord a New Song': The Regular Singing Movement in Colonial New England," *The Gettysburg Historical Journal* 3, no. 4 (2004): 10, https://cupola.gettysburg.edu/ghj/vol3/iss1/4.

aural/oral transmission, relying on a tradition of learning and sharing by ear. Singing Psalms held great significance in early American church services and cultural traditions. However, the congregation often lacked formal education in meter, key, or reading melody lines. Instructional methods like call-and-response or lining-out emphasized communal participation over formal notation.[38] This approach led to varying interpretations of the same tunes and eventually resulted in congregational singing that was "artistically dreadful."[39]

For over sixty years, a call for change resonated within the music scene, prompting a debate over proposed reforms in the singing practices of Puritan churches.[40] Supporters of the traditional rote singing style argued that learning to sing by note-reading restricted their musical freedom. They apprehensively feared that note instruction could reintroduce control associated with the influence of Popery.[41] Despite the controversies surrounding the matter, by 1740, the disputes had settled. As a result of this resolution, note instruction was approved and became more widespread and popular. This development improved congregational singing as individuals gained a better understanding of fundamental music principles.[42]

Master music teachers traveled to small towns and cities to teach adults and children how to read and sing music. This movement of traveling singing masters evolved into what became known as "singing schools."[43] Singing schools became enjoyable learning experiences and social

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[38] Harold F. Abeles, Charles R. Hoffer, and Robert H. Klotman, *Foundations of Music Education* (Boston, MA: Schirmer Books, 1984), 8, https://archive.org/details/foundationsofmus0000abel_b8h0/mode/2up.

[39] Bruce C. Daniels, *Puritans at Play: Leisure and Recreation in Colonial New England* (London: MacMillan, 1995), 54, https://archive.org/details/puritansatplayle0000dani/page/54/mode/2up.

[40] Daniels, *Puritans at Play*, 54.

[41] Ibid., 55.

[42] Michael L. Mark, "A New Look at Historical Periods in American Music Education," *Bulletin of the Council for Research in Music Education* 99 (Winter 1989): 3, https://www.jstor.org/stable/40318321.

[43] Mark and Madura, *Contemporary Music Education*, 4.

gatherings for families within communities, resulting in an increased demand for this type of music education. Church ministers started observing the congregation singing with increased musicality, a testament to the impact of the instruction led by singing masters.[44]

Singing schools' positive intellectual, social, and spiritual values inspired people to advocate for music instruction in public schools. In 1838, Lowell Mason, a prominent American composer, educator, and music reformer known for his tenacity and persuasive efforts in music education reform, successfully lobbied for public schools to include music. This initiative arose from the understanding that music education was essential for a child's holistic development and was recognized for providing intellectual, moral, and physical benefits.[45] Lowell Mason's advocacy marked the initial inclusion of music as a curricular subject in Boston's public schools. This event laid the groundwork for incorporating music education as a formal part of the curriculum in public schools across the United States. By the end of the nineteenth century, most schools nationwide had implemented music as a subject.[46] Music education became an effective means for teaching music skills to all children, allowing schools to partner with the community, fostering an appreciation of other cultures, respect for diversity, and the importance of building good citizenship.[47]

The Influence of Lowell Mason

Lowell Mason stood as one of the most significant figures in the history of musical growth in America. His impact on music education earned him the title of "Father of American

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[44] Mark and Madura, *Contemporary Music Education*, 5.

[45] Ibid.

[46] Ibid., xvi.

[47] Ibid., xviii.

Music Education."[48] He is recognized for his influence and contributions to church and school music for nearly sixty years. Ultimately, he developed a sound-before-symbol method of teaching music after learning about Pestalozzian theory from Woodbridge, a renowned geographer and educator. Woodbridge, who had traveled to Europe, discovered the Pestalozzian theory through Pfeiffer and Nägeli, two prominent European figures in music education and loyal supporters of Pestalozzi.[49]

Fully confident of the efficacy of a sound-before-symbol approach, Woodbridge returned to America with a collection of Pestalozzian treatises.[50] Over time, he convinced Mason to conduct a singing experiment based on these ideas. Despite Mason's initial reluctance, Woodbridge's determination persuaded him to agree. The experiment results convinced Mason that the Pestalozzian belief system surpassed his philosophy. He realized that establishing a foundation based on aural instruction was more advantageous for developing musical understanding than starting with note identification.[51] Embracing Pestalozzi's ideas, Mason coined a new teaching method called the "Pestalozzian Method," or "Inductive Teaching Method."[52]

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[48] Alyssa N. Grey, "Rote Instruction in Secondary Instrumental Music Classrooms: A Review of the Literature," *Update: Applications of Research in Music Education* 39, no. 1 (February 2020): 60, https://doi.org/10.1177/8755123320909149.

[49] Morris, "The Use of Pestalozzian Principles," 191.

[50] Efland, "Art and Music in the Pestalozzian Tradition," 173.

[51] George N. Heller and Carolyn Livingston, "Lowell Mason (1792–1872) and Music for Students with Disabilities," *The Bulletin of Historical Research in Music Education* 16, no. 1 (September 1994): 3, https://doi.org/10.1177/153660069401600101.

[52] Arthur L. Rich, "Lowell Mason, Modern Music Teacher," *Music Educators Journal* 28, no. 3 (1942): 22, https://doi.org/10.2307/3385901.

Now convinced that an aural approach to teaching music was crucial, Mason authored the *Manual of the Boston Academy of Music*. He based this book on Pfeiffer and Nägeli's treatises, which were founded on seven Pestalozzian principles:

1. To teach sounds before signs – to make the child sing before they learn the written notes or their names.
2. To lead children to observe, by hearing and imitating sounds, their resemblances and differences, their agreeable and disagreeable effect, instead of explaining these things to them – in short, to make them active instead of passive in learning.
3. To teach but one thing at a time – rhythm, melody, expression being taught and practiced separately before the child is called to the difficult task of attending to all at once.
4. To make them practice each step of each of these divisions until they are master of it, before passing to the next.
5. To give the principles and theory after practice, and as an induction from it.
6. To analyze and practice the elements of articulate sound in order to apply them to music.
7. To have the names of the notes correspond to those used in instrumental music.[53]

Mason asserted that music should be regarded as an aural art, emphasizing that teachers must not limit themselves to teaching note recognition alone; instead, they should prioritize aural education.[54] He questioned the conventional note instructional techniques in the singing school format and developed a music teaching approach grounded in Pestalozzi's principles. His curriculum prioritized the natural learning process of children, with rote singing as its foundation.[55] This singing style became imperative for music education, especially for beginners and young children. Mason encouraged students to learn songs through rote, imitation, and repetition before exploring note-reading. He argued that a sound-before-symbol strategy was

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[53] Lowell Mason, *Manual of the Boston Academy of Music: For Instruction in the Elements of Vocal Music, on the System of Pestalozzi* (Boston, MA: J. H. Wilkins & R. B. Carter, 1836), 1, https://archive.org/details/manualofbostonac00maso_1/page/n3/mode/2up.

[54] William M. Artman and Louis V. Hall, *Beauties and Achievements of the Blind* (Pub. for the authors, 1874), 327, https://liberty.alma.exlibrisgroup.com/view/action/uresolver.do?operation=resolveService&package_service_id=15660880320004916&institutionId=4916&customerId=4915&VE=true.

[55] Ibid., 2.

essential for cultivating a sense of musical style and expression, fostering familiarity with musical language and phrasing.[56] Mason believed an aural approach was necessary for developing the ear and the voice and advocated for its eventual integration with note-reading to offer diversity in music instruction.[57] Drawing from Pestalozzi's ideas, Mason formulated curriculum guidelines for the Boston schools, emphasizing sequential music teaching beginning with a sound-before-symbol approach.[58]

The Influence of Edwin Gordon

Edwin Gordon, a prominent scholar in music education, dedicated many years to studying how children learn music.[59] Through his research and observations, he found that students are often unprepared to absorb the material most music teachers try to teach them. He discovered reading and performing music entail a more profound thought process beyond merely playing or vocalizing notes on a page. Gordon suggested that music instruction should consider and mirror the sequential steps involved in learning to speak, read, and write. He reasoned that learning tonal and rhythm patterns parallels acquiring words, emphasizing that pattern instruction holds greater significance than memorizing individual names of pitches and note values.[60] Gordon recommended an instructional approach to music literacy where music educators

[56] Rich, "Lowell Mason," 3.

[57] Ibid., 2.

[58] Bluestine, *The Ways Children Learn Music*, 35.

[59] Gordon, "Taking a Look at Music," 3.

[60] Gordon, *Learning Sequences*, ix.

prioritize immersing children in an environment focused on listening and imitation rather than solely teaching them to read music notes.[61]

Inspired by these logical ideas, Gordon researched how children learn when they learn music. His findings led to the creation of music learning theory (MLT), a comprehensive and sequential approach that assists music teachers in developing their students' tonal and rhythm audiation skills. His practical field observations and study of educational theorists confirmed that for music instruction to be effective long-term, children need to comprehend what they hear and learn before advancing to more complex levels. Informed by the learning model of Gagné, a prominent educational psychologist, Gordon developed melodic and rhythm-patterned sequences within a hierarchical system that prioritizes aural and oral experiences (aural/oral) over note-reading instruction.[62] This principle of sequential instruction became central to music learning theory and the development of audiation.[63]

Gordon was adamant that before advancing to higher levels of music knowledge, children must first learn to audiate or "think in sound."[64] His research emphasized that successful music understanding requires students to progress through tiered vocabularies comparable to language acquisition. These stages include listening, speaking, thinking, reading, and writing.[65] He emphasized that children should fully grasp what they hear before reading or writing music. Listening, as the foundational skill, paves the way for all other musical abilities. Gordon

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[61] Runfola and Taggart, *The Development,* 480.

[62] Scott C. Shuler, "A Critical Examination of the Contributions of Edwin Gordon's Music Learning Theory to the Music Education Profession," *Visions of Research in Music Education* 16, no. 7 (2021): 46, https://opencommons.uconn.edu/vrme/vol16/iss2/7.

[63] Ibid.

[64] Gordon, "Taking a Look," 3.

[65] Ibid., 19.

highlighted that attentive listening and natural absorption of what they hear enable children to learn to speak. He believed music education should emulate this natural process.[66]

Gordon's extensive research led to the development of the music learning theory (MLT) framework, which directs music instructors to engage their students in foundational activities such as listening, chanting, and singing before introducing note instruction.[67] If appropriately implemented, children will build a listening vocabulary they can draw from when they begin to perform. Gordon revealed the unfortunate truth that not all children enter school with an eclectic internal music-listening library. He observed that most parents do not engage in musical conversations with their children. Therefore, music instructors ought to deliberately provide opportunities for children to develop a repertoire of musical listening experiences.

Gordon insisted that children must thoroughly grasp tonal and rhythm patterns before learning note names and values. He likened this approach to language acquisition, where children do not begin by learning the alphabet but draw from their listening library to speak. Just as hearing words precedes speaking, understanding tonal and rhythm patterns is essential before reading music. According to Gordon, the most effective method for familiarizing students with music is through direct teacher singing and employing a range of tonalities and meters. This approach introduces children to diverse tonal and rhythmic patterns through songs and chants and cultivates their music-listening vocabulary. By consistently exposing students to various listening and singing experiences from an early age, teachers establish a solid foundation for developing their musical understanding.[68]

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[66] Gordon, "Taking a Look," 19.

[67] Ibid.

[68] Rick Seifert, "Audiation Football: An Acculturation Game," *The GIML Audea* 3, no. 2 (Winter 1997): 13, https://drive.google.com/file/d/1RdPpFOnWKluBYIziWpYt3ZkVjNdIoMMG/view.

Influential Sound-Before-Symbol Methods

Orff Schulwerk Method

Orff Schulwerk, developed by Carl Orff in the early 1900s, is an educational approach that encourages children to explore their natural musical abilities through play, experimentation, and improvisation. This method embraces folk music and highlights the utilization of native language, instrumentation, timbres, rhythms, and melodies. Music literacy is approached through a systematic and sequential sound-before-symbol method, with the voice as the primary instrument.[69] Hands-on experiences engage children in creative music-making through rhymes, games, songs, movement, and instrument playing.[70] This student-centered experiential approach guides students to explore and internalize musical concepts directly through sound.[71] Orff's approach to music education shows evident influence from Pestalozzi's philosophy, particularly in prioritizing active engagement with sound as foundational for fostering an understanding and appreciation of music.[72]

Kodály Method

The Kodály method, a philosophy of music education and instructional approach, is centered around teaching, learning, and understanding music primarily through singing. Kodály believed that music is a language anyone can learn to speak.[73] Informed by the sequential stages

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[69] Sarrazin, *Music and the Child*, 339.

[70] Grey, "Rote Instruction," 61.

[71] Sarrazin, *Music and the Child*, 123.

[72] Carl Orff, "The Schulwerk: Its Origin and Aims," *Music Educators Journal* 49, no. 5 (1963): 70, https://doi.org/10.2307/3389951.

[73] "The Kodály Concept," Kodály Music Institute, accessed June 3, 2023, https://kodalymusicinstitute.org/about-kodaly-music-institute.

of child development, this method places the student at the core of the learning process through experiential learning activities incorporating listening, singing, chanting, and movement.[74] Additionally, the technique emphasizes singing and the exploration of quality musical repertoire, including folk and composed pieces, alongside relative solmization techniques.[75] It follows a sound-before-symbol approach and engages children in singing before introducing written notation.[76]

Kodály recognized that children typically have a vocal range of only five or six tones and cannot sing half-steps in tune.[77] Therefore, he stressed the significance of choosing musical material suitable for young singers based on the solfège pentatonic scale: "do," "re," "mi," "sol," and "la," within a movable "do" system. Kodály's approach teaches solfège with hand signs and rhythmic syllables to deepen students' musical understanding.[78] Solfège, hand movements, internal listening, and singing activities are applied to assist children in recognizing patterns and intervals, enhancing their aural and oral skills. The Kodály approach emphasizes the necessity of mastering singing through a sound-before-sight process before introducing instrumental playing.[79]

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[74] Grey, "Rote Instruction," 66.

[75] Lois Choksy, *The Kodály Method: Comprehensive Music Education from Infant to Adult* (Englewood Cliffs, N.J.: Prentice-Hall, 1974), 15, https://archive.org/details/kodalymethodcomp0000chok/page/14/mode/2up.

[76] Hussey, "The Kodály Method," 14.

[77] Choksy, *The Kodály Method*, 16.

[78] Sarrazin, *Music and the Child*, 190.

[79] Ibid., 178.

Suzuki Method

The Suzuki method is based on the idea that children can learn music much like they learn language: through listening, repetition, and active family support.[80] Observing how effortlessly children worldwide acquire their native language, Suzuki recognized the potential implications for music education. Therefore, he designed his method by applying the fundamental principles of language acquisition to music learning, coining it as the "mother-tongue approach."[81] This approach aims to develop musical skills and focuses on nurturing the child's character and morality, teaching them to become responsible citizens, and instilling a love of music. Drawing from Pestalozzi's holistic approach to education, Suzuki emphasizes parental love and involvement, recognizing parents as critical contributors to their child's whole development. He encourages active participation from parents in instruction, often having them join their child in learning the instrument.

Aligned with Pestalozzi's philosophy, Suzuki's method employs a sound-before-sight approach through hearing, imitation, and repetition before introducing notation. This involves immersing children in high-quality recordings and encouraging them to internalize melodies by ear through using melodies in new and more sophisticated ways.[82] Suzuki's structured, sequential approach, with a strong emphasis on aural training, lays the foundation for a deeper understanding of music before introducing notation.

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[80] Sarrazin, *Music and the Child*, 203.

[81] "About the Suzuki Method," Suzuki Association of the Americas, accessed June 3, 2023, https://suzukiassociation.org/about/suzuki-method/.

[82] Ibid., 3.

Gordon Method

Music learning theory (MLT), inspired by Pestalozzian principles and pioneered by Edwin Gordon, provides music educators with a cognitive and sequential framework based on how humans learn and comprehend music. Through extensive research and practical field testing, Gordon discovered teaching children to understand music is more complicated than simply teaching them to listen, imitate, and perform. He found that students must actively engage in a cognitive process to organize and comprehend the sounds they hear. To encapsulate this mental process, where the brain assigns meaning to musical sounds, Gordon coined the term "audiation."[83] This insightful word describes the thinking process that occurs when music is present, has been, or has never been present.[84] Audiation is fundamental to music aptitude and achievement and is the foundation of music literacy within the MLT framework.[85]

Gordon's academic research initially began with understanding the core aspects of music aptitude.[86] His intellectual journey was considerably influenced by the ideas of psychologists and educators: Robert Gagné, a renowned learning psychologist; [87] Jerome Bruner, a cognitive psychologist;[88] and Johann Heinrich Pestalozzi, an educational reformer.[89] These leading

[83] "Audiation," GIML, accessed November 19, 2023, https://giml.org/mlt/audiation/#:~:text=Audiation%20is%20the%20foundation%20of,(see%20types%20of%20audiation).

[84] Edwin Gordon, *The Aural/Visual Experience of Music Literacy: Reading and Writing Music Notation* (Chicago, IL: GIA Publications, 2004), 1.

[85] Ann W. Stokes, "Is Edwin Gordon's Learning Theory a Cognitive One?" *Philosophy of Music Education Review* 4, no. 2 (Fall 1996), 97, https://www.jstor.org/stable/40495421.

[86] Ibid., 96.

[87] Hohn, "An Educational Psychologist," 13.

[88] Freire and Freire, "Towards a Theory of Music Instruction," 3.

[89] Shuler, "A Critical Examination," 46.

educational figures influenced the development of music learning theory (MLT) and its sound-before-sight approach to music instruction.

The Gordon Method, also known as MLT, utilizes learning sequence activities, including imitation of tonal and rhythm pattern instruction, designed to be incorporated into an instructional process following a "whole-parts-whole" strategy. This approach integrates singing and chanting activities into daily lessons. Initially, students engage in discrimination or rote learning, echoing familiar tonal and rhythmic patterns. This aural/oral process gives meaning to the music students encounter, nurtures audiation development, and prepares them for inferential music thinking, where learning becomes independent and self-driven.[90]

The Music Learning Theory Approach

Edwin Gordon's music learning theory (MLT) is a comprehensive framework for music instruction that focuses on developing aural/oral skills, rhythmic understanding, and music literacy through carefully sequenced classroom activities that involve chanting and singing. Gordon compared the music learning process to how children learn language: by hearing sounds rather than seeing symbols. He designed instructional learning skill sequences (LSAs) based on tonal and rhythmic sequential patterns to develop audiation skills and readiness for musical understanding. This sequential approach prepares students for note instruction by first refining aural/oral skills through listening, singing, and chanting.[91] Gordon's MLT approach stands out

[90] Edwin Gordon, *Learning Sequences in Music: Skill, Content, and Patterns* (Chicago, IL: GIA Publications, 1988), 19.

[91] Shuler, "A Critical Examination," 40.

for its emphasis on the learning process. His strategies prioritize individual development and the psychological aspects of learning.[92]

Music Aptitude

Music aptitude pertains to the innate potential each child has for learning music, specifically in discerning the various sounds and patterns that comprise it. Individuals demonstrate their musical aptitude by perceiving differences in musical elements such as rhythm, dynamics, and pitch. The more familiar the students become with these musical distinctions, the higher their musical aptitude can rise. Music aptitude is a blend of inherent music abilities and developed audiation skills. Gordon discovered in his research that all children are born with the potential to strengthen their audiation skills and are equipped with a particular aptitude level.[93] Each child is born with a specific level of music aptitude, but their environment plays a crucial role in shaping their potential.[94] Gordon's research on music aptitude revealed that it is normally distributed at birth and fluctuates until approximately age nine. From birth to nine, parents and educators have a critical and time-sensitive opportunity to focus on developing music aptitude.[95]

Two types of music aptitudes exist: developing and stabilized. Developing aptitudes emerge at birth and stabilize around age nine. During this critical growth stage, a child's musical aptitude changes because of their natural talents and exposure to various musical experiences.

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[92] Senim Çenberci and Enver Tufan, "Effect of Music Education Based on Edwin E. Gordon's Theory on Children's Developmental Music Aptitude and Social Emotional Learning Skills," *International Journal of Music Education* (September 2023): 2, https://doi.org/10.1177/02557614231196973.

[93] Lange, *Together in Harmony*, 20.

[94] Edwin E. Gordon, *Music Learning Theory for Newborn and Young Children* (Chicago, IL: GIA Publications ProQuest Ebook Central, http://ebookcentral.proquest.com/lib/liberty/detail.action?docID=1359672. Created from liberty on 2024-01-21 01:15:13, 2013), 14.

[95] Ibid.

The more children are exposed to a diverse musical environment, the more their aptitude can evolve. The earlier children experience music, the better their chances of maximizing their musical potential.

Gordon developed four reliable music aptitude tests to assess students' musical aptitude and audiation. These tests offer valuable insights for music educators and parents, enabling them to tailor music instruction effectively. The tests are (a) Primary Measures of Music Audiation (PMMA), designed for students in kindergarten through third grade; (b) Intermediate Measures of Music Audiation (IMMA), for students in first through sixth grade; (c) Musical Aptitude Profile (MAP), a comprehensive assessment for students in grades five through twelve, and (d) Advanced Measures of Music Audiation (AMMA) for college-aged students.[96] Music instructors should understand each student's aptitude level and customize their teaching approaches to nurture individual musical skills and abilities. Music aptitude testing is not about inclusion or exclusion but about meeting the unique needs of every child on their musical journey.

Some parents and music educators may not realize the distinction between music aptitude and achievement. Gordon clarifies that music achievement reflects the skills and knowledge a child acquires in relation to their music aptitude, which is their inherent potential to develop musical skills and knowledge.[97] Bacon explains this by defining achievement as the ability to progress from one skill level to another and music aptitude as the factor determining how quickly

[96] Gordon, *Essential Preparation*, 111.

[97] Edwin Gordon, *Rating Scales and Their Uses for Measuring and Evaluating Achievement in Music Performance* (Chicago, IL: GIA Publications, 2002), 13.

this progression occurs.[98] Therefore, providing a rich musical environment can enhance each child's musical potential.

Audiation

According to Gordon, every child is born with a particular musical aptitude or learning potential, which relies on their audiation skills. Gordon compared language comprehension to music understanding, suggesting that both involve a thought process centered on sound.[99] To illustrate this, Gordon examined the four stages of language development: (a) Listening Vocabulary: Children initially absorb language through listening; (b) Speaking Vocabulary: Next, they start to express themselves verbally; (c) Reading Vocabulary: As language skills progress, reading comprehension develops; and (d) Writing Vocabulary: Finally, children learn to convey their thoughts in writing.[100] Similarly, in music learning, children progress through sequential vocabularies: (a) Listening: Students connect with music by actively listening; (b) Performing: Next, they demonstrate their skills through expression; (c) Reading: As their music skills grow, they develop the ability to read musical notation; and (d) Writing: Lastly, the students learn to articulate their musical ideas in written form.

To give depth to the musical learning journey, Gordon introduced the term "audiation."[101] He defined audiation as "hearing and comprehending music when the sound may or may not be physically present."[102] Gordon emphasizes that audiation is fundamental to music

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[98] Terrence Bacon, "Gordon's Music Aptitude Tests" (Lecture, GIML Quarterly Workshop, University at Buffalo, virtual, August 26, 2023).

[99] Gordon, "All about Audiation," 42.

[100] Ibid.

[101] Ibid.

[102] Lange, *Together in Harmony*, 20.

comprehension. Much like thinking while speaking, musicians engage in audiation while making music; it is a cognitive process, an internal understanding of music that informs performance.

Audiation needs the mind's effort to create meaning by processing, understanding, and interpreting sounds as music. It involves internally hearing musical patterns rather than individual notes. Gordon proposes that when children audiate, they spontaneously improvise and organize patterns within their minds.[103] He argues that audiation cannot be directly taught; instead, it emerges when learners are ready and can only be achieved through readiness.[104] As children enter preschool, some may lack a well-developed "listening library," which refers to their collection of internalized musical patterns. Gordon stresses the crucial role of music educators in nurturing audiation. Their primary focus should be creating a rich listening, singing, and chanting environment.

Tonal and Rhythm Patterns

Gordon recognized the need for a sequential readiness to facilitate the integration of audiation into traditional teaching methods. To promote this integration, he developed tonal and rhythm patterns that music teachers could incorporate during instruction. He illustrated through his research how the brain innately seeks patterns to create meaning.[105] For instance, the brain processes words as meaningful patterns rather than individual letters in language. Similarly, the brain naturally gravitates toward recognizing musical patterns rather than isolated notes in music development.[106] Teaching these musical patterns is essential for developing audiation and

[103] Lange, *Together in Harmony*, 20.

[104] Ibid.

[105] Ibid.

[106] Ibid.

mentally hearing and comprehending the music. Ultimately, audiation functions as the foundation for understanding music.

Pattern instruction in music highlights the significance of teaching students tonal and rhythm patterns. This approach involves guiding students to identify and recreate patterns in music, aiding in developing their musical skills and comprehension. Compared to language learning, Gordon remarked, "We learn to speak words, not letters, and we learn to perform tonal patterns (and rhythm patterns), not individual pitches and durations."[107] Tonal and rhythm patterns are the basic units of musical language, just like words and phrases are the basic units of spoken language. Learning tonal and rhythm patterns is essential for enhancing students' musical vocabulary. This educational approach often employs a whole-parts-whole learning process, beginning with exposure to diverse songs and musical examples, followed by focused instruction of specific patterns through imitation and improvisation.

Whole-Parts-Whole

Gordon supported and recommended a "whole-parts-whole" model, emphasizing that students learn best when they understand the overall context before focusing on specific details. He sometimes referred to this process as "synthesis-analysis-synthesis."[108] The activity introduces the big picture or context through demonstration and listening. This first whole (synthesis) engages and draws students in to understand why they are learning and what is to come. Next, the part (analysis) breaks down what they experienced. This second part is where

[107] Gordon, "Roots of Music Learning," 10.

[108] Edwin Gordon, "The MLT Approach," GIML, accessed April 21, 2023, https://giml.org/mlt/methodology/.

tonal and rhythm patterns are taught.[109] Students are introduced to learning sequence activities in a tiered order. These activities aim to improve their audiation skills by developing tonal and rhythm vocabularies through specific pattern instruction. These patterns are intentionally chosen to give meaning to what the students hear during the whole instruction.[110] Only about five minutes per class period should be allocated for these activities.[111] The last whole (synthesis revisited) returns to the first whole objective, but now, students are encouraged to apply the learned or practiced patterns.

Throughout this process, students learn to audiate rather than imitate. They are given opportunities to demonstrate their understanding of what they learned through singing and chanting specific tonal and rhythm patterns selected by the teacher. Implementing this procedure is a simple yet effective way to incorporate pattern instruction into traditional classroom activities.[112] The whole-parts-whole method is designed to start with whole-group participation and then advance to students performing patterns individually. This approach gradually develops student confidence and allows teachers to conduct ongoing formative assessments to monitor understanding and identify learning gaps.

Improvisation

As students gain confidence and familiarity with the MLT process, they are encouraged to expand upon their learned patterns. Their understanding of these patterns and variations forms the basis for creating spontaneous musical compositions or improvisations. This approach lets

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[109] Lange, *Together in Harmony*, 32.

[110] Ibid., 33.

[111] Ibid., 21.

[112] Bluestine, *The Ways Children Learn Music*, 18.

them incorporate their acquired vocabulary and concepts into expressive musical creations. Azzara defines improvisation in music as the spontaneous creation of meaningful patterns and phrases without relying on written music.[113] This instinctive creative thinking is an expressive process that uses audiation skills. It involves internalizing, hearing, and thinking about musical ideas. As the performer audiates the music in their mind, they spark their imagination, plan musical ideas, and perform freely. Improving audiation skills helps musicians anticipate and predict musical outcomes during improvisation, letting expressive ideas come naturally. Learning to improvise involves understanding musical vocabulary and using it freely to express ideas effectively.[114] This process can be compared to engaging in a conversation, where expressing ideas and thoughts occurs naturally.[115]

Improvisation is a valuable tool for young instrumentalists, aiding in developing higher-level thinking skills and enabling them to express themselves uniquely and creatively through their instruments. Students learning to improvise in an MLT setting undergo systematic training in vocalizing various tonal and rhythm patterns. This process begins with developing aural/oral skills and musical memory, which facilitates the internalization of musical structures. As a result, it fosters fluency in audiation and the language of music. Understanding the MLT approach guides music educators in progressively developing instruction for building improvisational skills.[116]

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[113] Christopher D. Azzara and Alden H. Snell, II, "Assessment of Improvisation in Music," *Oxford Handbooks Online* (October 2016): 9, https://doi.org/10.1093/oxfordhb/9780199935321.013.103.

[114] Christopher D. Azzara, "Audiation-Based Improvisation Techniques and Elementary Instrumental Students' Music Achievement," *Journal of Research in Music Education* 41, no. 4 (Winter 1993): 331, https://doi.org/10.2307/3345508.

[115] Ibid., 330.

[116] Lange, *Together in Harmony*, 17.

Beginning Band Instruction

Traditional Instructional Approach

Many instructional strategies and method books introduce skills and notation from the first lesson.[117] Choral and instrumental programs, often viewed as performance-based courses, can place a strong emphasis on notation instruction and learning repertoire for concerts. Although teaching notation straightaway may enable children to memorize and perform music more quickly, Gordon would argue that this mindset skips the necessary readiness steps that build audiation skills and understanding. He is concerned that performance-driven instruction relies too much on imitation and begins note-reading prematurely, thereby missing the foundational skills needed for true understanding.[118]

MLT Sound-Before-Symbol Approach

The sound-before-symbol/sound-before-sight approach, employed in beginning band instruction, prioritizes the development of aural/oral and audiation skills before introducing formal notation. Ausman's research highlights the effectiveness of this teaching style in enhancing the performance skills of beginning instrumentalists, specifically in areas such as rhythmic and melodic accuracy, ear-playing, and sight-reading.[119] Gordon's revolutionary work in MLT highlights the parallels between learning music and learning a language. Just as language acquisition starts with listening before speaking, Gordon implored music educators to

[117] Liperote, "Audiation for Beginning Instrumentalists," 46.

[118] Ibid.

[119] Ausman, "Sound Before Symbol," 103.

prioritize the development of listening skills through singing and chanting tonal and rhythm patterns long before introducing formal notation.

Liperote concurs with Gordon's approach, affirming, "[Singing] plays a fundamental role in developing comprehensive musicianship and music literacy while also serving as a readiness for learning to play an instrument."[120] Given the opportunity and time, Liperote asserts that beginning band students who engage in singing and listening activities will develop advanced aural skills and use that knowledge to play an instrument more proficiently. Research shows that establishing readiness through aural/oral skill training leads to proficiency in playing in tune, maintaining rhythmic accuracy, adhering to a consistent tempo, improvising with understanding, and eventually acquiring the ability to read and write notation.[121]

While a substantial body of research exists on Gordon's MLT, audiation, and the sound-before-symbol approach, it remains essential for instrumental teachers to be informed about the benefits of this learning style and effective strategies for successfully implementing it in beginning band programs. Just as crucial is for beginning band instructors to select a method book based on a sequential learning approach and incorporating aural/oral activities. This ensures that students develop fundamental musical skills in a structured manner, starting with listening and vocalization before progressing to instrumental playing while also aligning with the instructor's philosophy and preferences. Beginning band method books should contain familiar

[120] Kathy Liperote, "Singing in Instrumental Music Instruction," *The Routledge Companion to Interdisciplinary Studies in Singing* (2020): 3, https://doi.org/10.4324/9781315162607-36.

[121] Ibid., 5.

tunes, minor tonalities, and vocalization activities to help students develop a strong sense of pitch, rhythm, and tonality.[122]

Vocalization in Beginning Band Instruction

Research indicates vocalization as a beneficial instructional technique within instrumental music classrooms, demonstrating its positive impact on student learning and musical development. However, empirical evidence suggests that many teachers face challenges integrating singing into instrumental instruction despite solid advocacy from MLT educators and theorists. Numerous studies investigating vocalizing techniques in instrumental education have shown that consistent use of vocalization activities, such as singing songs, audiating resting tones, and vocalizing tonal/rhythm patterns, significantly enhances the musical achievement of beginning band students.[123]

Practical Vocalization Instructional Techniques

Liperote exemplified how incorporating rote singing activities with familiar songs from the beginning band repertoire can function as vocalization activities in an instrumental setting. Her approach followed a structured progression:

1. Melody exploration: Initially, she encouraged students to rely on their ears, challenging them to listen carefully and sing the melody.

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[122] James L. Byo, "Beginning Band Instruction: A Comparative Analysis of Selected Class Method Books," *Update: Applications of Research in Music Education* 7, no. 1 (Fall 1988): 21, https://doi.org/10.1177/875512338800700106.

[123] Helga R. Gudmundsdottir et al., "Singing in Instrumental Music Instruction," in *The Routledge Companion to Interdisciplinary Studies in Singing, Volume II: Education* (London: Routledge, 2020), Oxford: Taylor & Francis Group, 2020. Accessed June 1, 2023. ProQuest Ebook Central, 454.

2. Bassline emphasis: Next, Liperote directed students' attention to the bass line, prompting them to hear and sing it.
3. Group participation: Finally, she organized students into rows or instrument groups, collaboratively assigning them to sing the melody or bass line.

The reported outcome of this instructional technique was a significant shift in students' reliance, moving away from reading notation and teacher guidance towards dependence on their audiation skills.[124]

Burnsed and Fiocca investigated vocalization techniques, focusing specifically on the pedagogy of enhancing audiation skills within beginning band education. The first approach involves introducing various ways to articulate notes using syllables like "du" or "ta." The band instructor can utilize these syllables in vocalization techniques like echoing, chanting, and singing to assist students in positioning their tongues correctly. This process enables students to practice articulation and demonstrate proficiency as they apply it to their instruments.[125] The second technique employs echo response. For instance, students can learn a simple bass line ostinato through echo-playing to accompany the familiar tune "Hot Cross Buns." Once they have mastered the bass line, the class is divided into two groups: one group plays the ostinato, while the other performs the melody. This instructional strategy exemplifies how students can develop their auditory perception before relying on notation.[126]

Elliot's research on employing vocalization techniques to instruct beginner band students shows that incorporating singing exercises into instruction can significantly improve pitch

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[124] Liperote, "Audiation for Beginning Instrumentalists," 48.

[125] Vernon Burnsed and Pamela Fiocca, "Bringing General Music Techniques to the Instrumental Class," *Music Educators Journal* 76, no. 6 (February 1990): 46, https://doi.org/10.2307/3400967.

[126] Burnsed and Fiocca, "Bringing General Music," 46.

accuracy and intonation.[127] He stressed the importance of having students vocally perform their band parts during class, which creates a stronger connection between the auditory experience and musical notation. Helping students connect their vocal sounds with musical notation instead of solely focusing on finger positions enables the development and refining of aural skills.[128] Moreover, research indicates that integrating singing into band instruction from an early stage helps students play more in tune.[129]

Gates' research underscored the importance of students comprehending and genuinely listening to the music they create rather than merely observing it. To support this, he recommends employing the following vocalization techniques: Using vocal sirens, a gradual glissando from low to high pitch, to help students navigate interval studies and lip slurs effortlessly;[130] vocalizing various vowel sounds during lessons to assist the students in achieving excellent tone quality;[131] chanting rhythms to internalize a steady pulse;[132] and singing song phrases to demonstrate effective phrasing while playing.[133]

Bernhard's study on incorporating singing in instrumental music classrooms highlights techniques that yielded significant results in music performance and achievement scores. His

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[127] Charles A. Elliott, "The Effectiveness of Singing in the Beginning Band Class," *A Journal of Band Research* 9, no. 1 (Fall 1972): 38, https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/scholarly-journals/effectiveness-singing-beginning-band-class/docview/1312111511/se-2.

[128] Ibid.

[129] Ibid., 39.

[130] Gates, "Using Singing as a Teaching Tool in Brass Playing," (master's thesis, The University of Akron, 2017), https://ideaexchange.uakron.edu/honors_research_projects/, 7.

[131] Ibid.

[132] Ibid., 8.

[133] Ibid., 9.

findings identified five vocalization techniques that demonstrated notable effects on instrumental achievement and could be readily utilized as instructional tools in a beginning band setting. These techniques include:

1. Singing notes using solfège and employing a moveable "do."[134]
2. Singing notes using numbers to represent the different degrees of the scale.[135]
3. Singing note letter names of the pitches (B flat, C, D, etc.)[136]
4. Singing the music excerpts using a neutral syllable like "la."[137]
5. Singing the lyrics to the musical excerpts performed.[138]

In his exploration of how band directors can best support their students in learning music notation, West introduces five practical sound-before-sight approaches to teaching notation suitable for a beginning band setting, including:

1. Iconic notation: After learning a tune by rote, students create visual representations such as melodic contours, fingerings, note names, or solfège names and are encouraged to practice at home.[139]
2. Point and play: Using the iconic notation sheet, students teach the tune to their teacher by pointing to the images while the teacher plays, and vice versa.[140]

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[134] Christian H. Bernhard, "Singing in Instrumental Music Education: Research and Implications," *Update: Applications of Research in Music Education* 22, no. 1 (May 2002): 29, https://doi.org/10.1177/87551233020220010501.

[135] Ibid., 30.

[136] Ibid.

[137] Ibid., 31.

[138] Ibid.

[139] Chad West, "Sound Foundations: Organic Approaches to Learning Notation in Beginning Band," *Music Educators Journal* 102, no. 4 (June 2016): 58, https://doi.org/10.1177/0027432116636941.

[140] Ibid., 59.

3. Student lead sheet: Teachers provide a sheet with a well-known tune and a menu, allowing students to select pitches, duration, note names, or fingerings to create their own notation. Eventually, students transcribe their lead sheet into standard notation.[141]
4. Modeling: The teacher projects specific rhythm and tonal patterns on a screen, demonstrating and pointing to each as students echo.[142]
5. Kid diction: Students arrange note cards, each containing one measure of a familiar tune, in the correct order.[143]

Dalby offers advice on enhancing beginning band instruction by including specific aural teaching strategies to demonstrate the effectiveness of a sound-before-sight approach. His primary recommendation emphasizes the fundamental role of singing in musicianship, suggesting that instrumentalists should be taught to sing. When students learn to vocalize, they can imagine singing through their instruments, fostering a deeper musical connection and enabling them to play more expressively. Singing builds audiation skills and teaches students how to play in tune using their ears and not just their eyes. Secondly, teaching bass lines, also known as root melodies, helps students understand how their part contributes to the overall musical texture, promoting ensemble unity. Lastly, familiar tunes should be taught by the ear. This method enhances students' ability to link mental hearing with physical instrument manipulation. Dalby stresses the importance of cultivating an internal ear for musical

[141] West, "Sound Foundations," 59.

[142] Ibid., 60.

[143] Ibid.

comprehension. As students' familiarity with musical patterns increases, their audiation skills and musical instincts naturally strengthens.[144]

Relevant Vocalization Studies

Grutzmacher explored the relationship between tonal pattern instruction and tonal concept development in a beginning band setting, employing singing tonal patterns and hearing harmonization with the assistance of an Omnichord.[145] She instructed an experimental group to learn to read tonal patterns, hear harmonization, and sing tonal patterns. In contrast, the control group focused on technical skill development through note and symbol recognition without using tonal patterns, harmonization, or vocalization. After the study, all students underwent assessments covering sight-reading achievement, aural perception of major and minor tonal patterns, and reading recognition. The results significantly favored the experimental group, highlighting the effectiveness of vocalization and harmonic instructional strategies over traditional approaches.[146]

Haston's research explored a sound-before-sight approach to instructing beginner wind instrumentalists. His study emphasized the holistic consideration of the eyes, ears, fingers, and oral cavity when teaching beginning band musicians. Traditionally, instruction starts with notation, focusing on note fingerings and technical skills. However, Haston contends that this method encourages students to merely "push buttons" on their instruments without an aural context. Instead of using a traditional instructional method, Haston explored the benefits of

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[144] Bruce Dalby, "Teaching Audiation in Instrumental Classes," *Music Educators Journal* 85, no. 6 (May 1999): 22, https://doi.org/10.2307/3399517.

[145] Grutzmacher, "The Effect of Tonal Pattern," 178.

[146] Ibid.

employing modeling and rote teaching to encourage the development of audiation skills. His research proposed various experimental strategies, including tonal pattern instruction, singing, modeling, playing by ear, and improvisation.

Haston divided twenty participants into two groups for his research using a post-test control group design. Both groups used similar materials but were taught with different instructional strategies. In each lesson, the instructor taught the experimental group through modeling and echo-singing, enabling them to learn to play by ear. However, the control group did not use these strategies. Although not statistically significant, the results showed higher scores on the Watkins Farnum Performance Scale test, a standardized achievement test, for students taught through modeling, emphasizing developing aural skills.[147]

Researchers Dickey,[148] Grutzmacher,[149] and MacKnight[150] provided quantitative evidence for their research and demonstrated that melodic-echoing, sight-reading, and ear-playing skills positively impact music achievement test scores.[151] Bernhard also explored this perspective by examining studies on tonal pattern instruction and modeling techniques for beginning band students. In his research, he implemented this knowledge by teaching students in an experimental group to sing the notes of familiar melodies using neutral words like “loo” or solfège syllables. Conversely, the control group received traditional instruction with notation introduced from the

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[147] Haston, “Beginning Wind Instrument Instruction,” 17.

[148] Marc R. Dickey, “A Comparison of Verbal Instruction and Nonverbal Teacher-Student Modeling in Instrumental Ensembles,” *Journal of Research in Music Education* 39, no. 2 (Summer 1991): 132, https://doi.org/10.2307/3344693.

[149] Grutzmacher, “The Effect of Tonal Pattern,” 178.

[150] Carol B. MacKnight, “The Development and Evaluation of Tonal Pattern Instruction in Music Reading for Beginning Wind Instrumentalists,” (PhD diss., University of Massachusetts Amherst, 1973), 98, file:///D:/The%20development%20and%20evaluation%20of%20tonal%20pattern%20instruction_MacKnight%20Diss.pdf.

[151] Bernhard, “The Effects of Tonal,” 93.

start and no specific tonal training.[152] Comparing test scores between the experimental and control groups indicated tonal training significantly influenced ear-playing but not melodic sight-reading achievement.[153]

Elliott, intrigued by tonal training, investigated the impact of incorporating singing exercises in a beginning band setting.[154] His study aimed to determine if these exercises could enhance participants' ability to discriminate pitch. His approach involved teaching students to sing pitches and exercises directly from the method book. During vocalization, students echoed the instructor and sang notes using "la." In the first part of the experiment, students played the exercise, sang it, and then replayed it. In the second part of his study, students were given a starting pitch and were challenged to vocalize the exercises without playing them first. His study revealed consistent singing during beginning band lessons significantly improved participants' sense of pitch and tonal memory.

Summary

This comprehensive review analyzed and synthesized various sources related to vocalization techniques and the sound-before-sight instructional approach. The literature highlighted Pestalozzi as a visionary whose comprehensive educational approach impacted practices worldwide. His emphasis on holistic education aimed to cultivate well-rounded individuals by nurturing their intellectual, emotional, and physical development. In music education, Pestalozzi's influence is reflected in the sound-before-symbol approach, prioritizing

[152] Bernhard, "The Effects of Tonal," 95.

[153] Ibid., 101.

[154] Charles A. Elliott, "Effect of Vocalization on the Sense of Pitch of Beginning Band Class Students," *Journal of Research in Music Education* 22, no. 2 (1974): 121, doi:10.2307/3345312.

aural and oral skill development before the introduction of notation. Esteemed music educators like Lowell Mason, Zoltan Kodály, Shinichi Suzuki, Carl Orff, and Edwin Gordon held this hierarchical method in high regard. Furthermore, the literature suggested that Pestalozzian ideas significantly influenced Gordon's philosophy and the design of his audiation and music learning theory (MLT) concepts.

Many beginning band educators often do not fully embrace the pedagogical philosophy of the sound-before-symbol approach in their instruction. This reluctance may stem from the fact that the majority of popular beginning band method books prioritize teaching notation, symbols, rhythms, and fingerings from the outset, placing visual instruction ahead of aural/oral development. Consequently, students encounter reading notes without the necessary aural context or readiness. While note-reading remains necessary in instrumental instruction, the findings from this review underscore the critical importance of prioritizing a sequential sound-before-sight instructional strategy as foundational to nurturing aural skills and fostering a deeper understanding of music.

Chapter Three: Methods

Introduction

Research suggests a strong correlation between vocalization and fluency in performing within instrumental music education, indicating that incorporating a sound-before-sight approach can significantly deepen musical understanding and contribute to the development of well-rounded musicians.[1] This underscores the significance of exploring the impacts of singing and chanting as instructional methods in instrumental lessons, particularly within beginner band contexts. To investigate this further, the researcher employed a quantitative, experimental, two-group post-test design methodology that involved fourth and fifth-grade beginning band students. One group received nontraditional instruction grounded in music learning theory (MLT) principles, focusing on audiation and a sound-before-sight instructional approach. In contrast, using a standard method book, the other group followed a traditional note-by-note technique. Over nine weeks, the study examined the differences in music aptitude and music achievement post-test scores among beginning band students.

This chapter presents an extensive outline of the research design and questions, detailing the instruments employed for data collection and the tools utilized for analysis. It is followed by descriptions of both the participants involved and the setting of the study. It examines the selection of measurement tools and the validity and reliability of the gathered data. Furthermore, the chapter provides insights into the research approval process, subject selection criteria, and

[1] Bernhard, "Singing in Instrumental Music Education," 47.

procedures for obtaining permissions. It also outlines the treatment process, testing protocols, data collection methods, and analysis procedures.

Design

This quantitative, experimental, two-group post-test design investigated the effects of an instructional sound-before-sight (vocalization) intervention on music aptitude and tonal music achievement scores among beginning band students. The researcher assigned participants to either an experimental or control group and conducted pre- and post-tests for both groups. The post-test results were analyzed to determine whether the mean difference in post-test scores between the treatment group, which received vocalization techniques, and the comparison group was statistically significant. This analysis aimed to address the research questions and demonstrate the effectiveness of vocalization techniques in enhancing music achievement and aptitude scores. Subsequently, pre-test and post-test data were utilized in paired *t*-test analysis to understand effect size and to assess the degree of change within each group from pre-intervention to post-intervention.

The researcher selected an experimental research design to examine the cause-and-effect relationship between the independent variable, instructional style, and the dependent variable, pre- and post-test scores. Participants were randomly assigned to two groups: Cobalt for the control condition and Emerald for the experimental condition. This random assignment was facilitated using *Wheel of Names*, an online tool designed for random name selection.[2] Both

[2] "Wheel of Names," accessed September 30, 2023, https://wheelofnames.com/.

beginning band groups learned the same eight melodies chosen from the *Standard of Excellence: Comprehensive Band Method: Book One*.[3]

The experimental group was taught using vocalizing strategies, audiation development techniques, and instructional elements taken from Gordon's music learning theory. Before performing a song independently, the experimental group followed a sequential process that included listening, chanting, singing, solfège signing, "singering," and engaging in echo-singing and echo-playing. In contrast, the control group followed the traditional note-recognition method outlined in the method book without incorporating vocalization activities.

Research Questions and Hypotheses

RQ1: Is there a difference in Intermediate Measures of Music Audiation – Tonal Subtest (IMMA TS) music aptitude post-subtest scores between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

RQ2: Is there a difference in Level 1—Audiation/Listening—Tonal Aural (T1) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

RQ3: Is there a difference in Level 1—Audiation/Reading—Tonal Reading (T2) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

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[3] Pearson, *Standard of Excellence*, 1.

$H_0$1: There is no difference in Intermediate Measures of Music Audiation – Tonal Subtest (IMMA TS) music aptitude post-subtest scores between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices).

$H_0$2: There is no difference in Level 1—Audiation/Listening—Tonal Aural (T1) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices).

$H_0$3: There is no difference in Level 1—Audiation/Reading—Tonal Reading (T2) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices).

Participants and Setting

The researcher selected the participants from grades four and five of an elementary school situated in a small rural school district in the mid-western United States. In the academic year 2023–2024, the school district enrolled approximately 350 students from pre-kindergarten through twelfth grade. It includes a preschool, an elementary school covering kindergarten through sixth grade, a junior and senior high school spanning grades seven through twelve, and an alternative learning center serving grades nine through twelve. Before this study, the school district provided instrumental instruction starting from grade five. However, in the fall of 2023, students in grade four were allowed the option to enroll in the beginning band program and be included in this study. Instruments were provided for students who could not afford them. The

district employs two band directors: (a) 0.25 FTE for grades four, five, and six and (b.) 1.0 FTE for grades seven through twelve.

This study involved all elementary students in grades four and five who enrolled in the beginning band program ($N = 43$). The researcher determined that a convenience sampling technique would be most suitable, considering the ease of accessibility, proximity, availability, and willingness of the subjects to participate.[4] During the second week of school, a beginning band inquiry session introduced all fourth and fifth-grade students to the flute, clarinet, trumpet, and trombone. Following this presentation, the band instructor distributed an informational letter, a contact form, and an instrument selection sheet for students to take home. Students interested in joining were encouraged to specify their top two instrument preferences on the sheet. Subsequently, the researcher documented the students' instrument selections and arranged small group meetings to experiment with their chosen instruments and determine the best fit. Forty-three students expressed interest in joining the band. Requirements for participation were that parents and students had to commit to a full year of band instruction, allowing ample time for fundamental skill development, and no instrument changes could occur during the study period.

The convenience sample for this research involved first-year band students ($N = 43$) who provided assent and obtained parental consent to participate. Twenty boys and twenty-three girls agreed to participate in the study. There were no ability screenings before enrollment, and the researcher imposed no limitations or prerequisites. The school provided instruments to students who wanted to join the beginning band program but required financial assistance to afford them. None of the students ($N = 43$) received additional private music instruction on their instruments

[4] Ilker Etikan, "Comparison of Convenience Sampling and Purposive Sampling," *American Journal of Theoretical and Applied Statistics* 5, no. 1 (December 2016): 2, https://doi.org/10.11648/j.ajtas.20160501.11.

or voices throughout the study. Three students were enrolled in private piano lessons, with one participating in a local boys' choir. The researcher sought approval from the Institutional Review Board (IRB) to safeguard students' rights and welfare.[5]

Logistical constraints dictated both the study's design and sample size. To recruit sufficient participants to address the research questions, the researcher adopted a medium effect size of 0.5, with $\alpha = .05$.[6] Given the multiple comparisons in this study, the researcher applied the Bonferroni correction, resulting in a significance level of .017 to control for the familywise error rate. The sample consisted of fourth and fifth-grade beginning band students ($N = 43$) divided into two groups.

The researcher categorized students based on their chosen instruments: flutes ($n = 6$), clarinets ($n = 15$), trumpets ($n = 10$), and trombones ($n = 12$). After this grouping, the researcher used the online random name picker tool, *Wheel of Names*, to assign individuals to the control or experimental groups. The researcher entered the first names of participants from each instrumental group into the website and subsequently spun the wheel to reveal one name at a time. The first name selected was assigned to the experimental group (Emerald group), whereas the second was assigned to the control group (Cobalt group). The researcher repeated this process until all names were assigned. Due to an odd number of students, the Emerald group ($n = 22$) contained one more student than the Cobalt group ($n = 21$).

To assist students in recalling their group assignments, the researcher chose the names Emerald and Cobalt. Using the initials "E" and "C" aided the researcher in distinguishing which

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[5] "IRB Registration," HHS.gov, last modified December 14, 2021, https://www.hhs.gov/ohrp/register-irbs-and-obtain-fwas/irb-registration/index.html.

[6] Susan E. Morgan, Tom Reichert, and Tyler R. Harrison, *From Numbers to Words: Reporting Statistical Results for the Social Sciences* (New York, NY: Pearson College Division, 2002), 12.

group received treatment. Although the students remained unaware of Emerald's experimental status and Cobalt's control status, they recognized that each group received distinct instructions. The researcher explained to the students that they were participating in a significant experiment to assist the teacher in improving beginning band instructional techniques.

All group lessons occurred every Tuesday morning in homogeneous groups for twenty-minute sessions starting at 8:45 a.m. and concluding at 11:15 a.m. The composition of the groups was as follows (see Table 3):

A. Flutes: Emerald (n = 3, three girls) and Cobalt (n = 3, three girls)
B. Clarinets: Emerald (n = 8, six girls and two boys) and Cobalt (n = 7, five girls and two boys)
C. Trumpets: Experimental (n = 5, three girls and two boys) and Cobalt (n = 5, two girls and three boys)
D. Trombones: Emerald (n = 6, one girl and five boys) and Cobalt (n = 6, six boys).

Table 3. Instrumentation Numbers

	Experimental Emerald	Control Cobalt
Flute	3	3
Clarinet	8	7
Trumpet	5	5
Trombone	6	6

Instrumentation

The researcher employed three assessment tools to measure pre- and post-test data related to the achievement and aptitude of beginning band students. Tonal and reading audiation skills

and developmental music aptitude levels were evaluated. The assessments included the Intermediate Measures of Music Audiation Tonal Subtest (IMMA TS), the Iowa Tests of Musical Literacy – Audiation/Listening subtest (ITML-T1), and the Iowa Tests of Musical Literacy – Audiation/Reading subtest (ITML-T2). The parents and children in this study provided informed consent, and all families agreed to participate (see Appendix A).

Intermediate Measures of Music Audiation (IMMA)

Gordon's standardized music aptitude tests are widely acknowledged and utilized by music educators nationwide. He developed two assessments for elementary students: the Primary Measures of Music Audiation (PMMA) for kindergarten through third-grade students and the Intermediate Measures of Music Audiation (IMMA) for first through sixth-grade students. Teachers are encouraged to assess and compare each child's developmental tonal and rhythmic aptitudes annually from kindergarten through grade four. In grades five and six, students should undergo testing to determine their stabilized level, revealing their tonal and rhythmic strengths and weaknesses. Compared with other students and established norms, music instructors can use these scores to inform their teaching practices to address students' weaknesses and support their strengths.

The researcher of this study employed the IMMA tonal subtest assessment to measure the developmental music aptitude of each participant and gauge their ability to discern conceptually whether a pair of tonal patterns played sounded the same or different. This subtest includes forty pairs of melodic patterns. Reliability reports from the IMMA offer insights into the assessment's performance. They reveal the reliability of .85 for the tonal subtest in "Test-Retest with Raw

Scores" and .72 for the "Split-Half Reliability" of the same subtest.[7] The Standard Error of Measurement for this subtest is 1.1.[8] Although the IMMA assessment encompasses tonal and rhythmic subtests, the participants in the current study were evaluated specifically on the tonal subtest.

Iowa Tests of Music Literacy (ITML)

The Iowa Tests of Music Literacy (ITML), developed by Gordon, are the only standardized music achievement tests published in the United States. These tests aim to evaluate student growth and improvement in music achievement over time, diagnose student strengths and weaknesses in music achievement, and compare student performance relative to their peers. The tests are structured into two main sections: tonal concepts and rhythm concepts, and they are organized into six progressively challenging levels.[9]

Music instructors employ the ITML for several purposes: to monitor student progression, ensuring ongoing musical development; to evaluate whether students' musical achievements align with their aptitude levels; to track changes in musical abilities from pre- to post-test; and to compare music achievement among students, aiding in identifying strengths and areas needing improvement.[10] The sections and subtests included in this investigation were Tonal Concepts Level 1: Audiation/Listening T1 (ITML T1) and Tonal Concepts Level 1: Audiation/Reading T2 (ITML T2).

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[7] Gordon, "Iowa Tests," 62.

[8] Ibid.

[9] Edwin E. Gordon, "GIA Publications - Iowa Tests of Music Literacy - Level 1 Kit," accessed August 6, 2023, https://www.giamusic.com/store/resource/iowa-tests-of-music-literacy-level-1-kit-book-g3636l1.

[10] Edwin Gordon, *The Psychology of Music Teaching* (Upper Saddle River, MA: Prentice Hall, 1971), 134.

The Iowa Tests of Music Literacy (ITML) norms are derived from the results of 18,680 students from twenty-seven school districts across thirteen states known for their reputable music departments.[11] The ITML demonstrates strong reliability. The split-half reliability coefficients, corrected using the Spearman-Brown Prophecy Formula, range from .87 to .94 for the entire test.[12] The reliability scores for the level two subtests range from the .70s to the .80s., indicating moderate to high reliability.[13] These scores validated the instrument's reliability, meeting the acceptable standard of reliability coefficients of .70 or higher in social science research.[14] The ITML underwent seven years of development to ensure content validity. Validity coefficients for the complete test range from .61 for level three to .71 for level one.[15] Table 4 contains the data for the reliability of the ITML-T1 and ITML-T2 sub-tests. Although the complete ITML kit includes six levels, the researcher only purchased and employed level one.

Table 4. Grades 4-6 Raw Score Reliability: ITML Level 1

Tonal Concepts	Mean	Standard	Reliability Split-Halves
Audiation/Listening (T1)	11.0	4.49	.84
Audiation/Reading (T2)	15.9	3.47	.74

Source: Gordon, *Iowa Tests of Music Literacy Manual* (Chicago, IL: GIA Publications, 1991), 62.

[11] Edwin E. Gordon, *Iowa Tests of Music Literacy Manual* (Chicago, IL: GIA Publications, 1991), 60.

[12] Boyle, "Iowa Tests," 283.

[13] Ibid.

[14] UCLA Statistical Methods and Data Analytics, "What Does Cronbach's Alpha Mean? | SPSS FAQ," OARC Stats – Statistical Consulting Web Resources, accessed November 26, 2022, https://stats.oarc.ucla.edu/.

[15] Runfola and Taggart, *The Development,* 23.

Procedures

After securing approval from the dissertation committee and Liberty University's IRB, the researcher sought permission from the school district's superintendent and elementary assistant principal to conduct an experimental project involving fourth and fifth-grade beginning band students (see Appendix B). This study evaluated how effective vocal-based teaching methods are within a beginning band program, focusing on instructional style as the primary independent variable. The researcher divided the participants into two groups: the experimental group, which received instruction using a sound-before-symbol vocalizing technique, and the control group, which followed the traditional beginning band method book focusing on note-by-note instruction. Despite the differences in teaching approaches between the experimental and control groups, instruction included the same eight melodic excerpts derived from the *Standard of Excellence: Comprehensive Band Method: Book One* instrumental method book (see Table 6). All participants attended twenty-minute homogeneous lessons each week for nine weeks.

Permission Procedures

The researcher obtained approval from the IRB to protect students' rights and welfare during the study (see Appendix A). Parent consent and child assent forms, along with envelopes, were printed by the researcher and distributed to each beginning band student. Clear instructions were provided on signing the forms, how to place them in the provided envelopes, and when to return the envelope to their homeroom teacher. Homeroom teachers assisted in collecting the research study materials.

The parental/guardian letter (see Appendix E) included the purpose of the creative instrumental music project and collected information on student age, gender, grade, and musical experience. If the student and parent/guardian consented to participate, the researcher invited

them to complete the questionnaire (see Appendix G) and sign the permission form (see Appendix E). The child assent form (see Appendix F) contained the project's objectives in a simplified, age-appropriate manner. The researcher requested that children who consented to participate sign the child assent form. Subsequently, the letter instructed families to place and seal the signed forms in the provided manila envelope and return them to the student's homeroom teacher by the following week. The researcher included all forty-three beginning band students in the project after they submitted their forms. All paper documents were securely stored in a locked cabinet in the researcher's home office, and all electronic data collected throughout the project were saved on a password-protected personal computer. To ensure the anonymity of the participants, the researcher assigned numeric codes to students' names.

Group Lesson Procedures

The elementary school's band program operates within a pull-out setting, where students are scheduled for twenty-minute lessons once a week. The researcher randomly assigned the forty-three participants to homogeneous instrument sections, comprising three to eight students per group. Lessons were rotated weekly to ensure that students did not have the same lesson time every week, providing variety in scheduling. The assignment of the students into the Emerald (experimental) and Cobalt (control) groups was random using the online random name picker "Wheel of Names." Table 5 outlines the division of students into instrumentation and grade levels.

The questionnaire administered by the researcher revealed that none of the students were enrolled in private instrumental lessons during the study. However, three students were enrolled in private piano lessons, and one participated in a local boy choir. Although the assignment of the participants was random, those who took private piano lessons (n = 3) and participated in a

boys' choir (*n* = 1) were evenly distributed between the experimental (*n* = 2) and control groups (*n* = 2). All participants received additional general music instruction at the school for fifty to seventy-five minutes per week. By week seven of the nine-week project, beginning band students began participating in additional full band rehearsals once a week for forty-five minutes to prepare for the winter concert. The overall sample included participants enrolled in grades four (*n* = 17) and five (*n* = 26).

Table 5. Student Distribution: Exp. (Emerald) & Ctrl. (Cobalt) Groups

Emerald Instrumentation	4th grade	5th grade	Total
Flutes	1	2	3
Clarinets	6	2	8
Trumpets	1	4	5
Trombones	2	4	6
			22 total
Cobalt Instrumentation	**4th grade**	**5th grade**	**Total**
Flutes	0	3	3
Clarinets	4	3	7
Trumpets	2	3	5
Trombones	1	5	6
			21 total

During this nine-week study, the two groups received instruction through distinct techniques. Group Emerald, the experimental group, was taught using a unique sound-before-sight strategy, emphasizing singing and chanting without learning notation, in contrast to the traditional note-reading method. Group Cobalt, the control group, followed a conventional note-reading method based on the curriculum outlined in the *Standard of Excellence: Comprehensive Band Method: Book One*. The instruction for this group covered performance skills related to note names, symbol recognition, rhythmic counting, and fundamental instrumental techniques, including posture, embouchure, articulation, breathing, and hand positions. Both groups learned

identical melodies from *Standard of Excellence: Comprehensive Band Method: Book One* (see Table 6).

Table 6. Instructional Melodies

Experimental Group Melodies Created via MuseScore	Control Group *Standard of Excellence: Comprehensive Band Method: Book One*
"Hot Cross Buns"	"Hot Cross Buns" #16
"Little Friend Pierrot"	"Au Claire de la Lune" #17
"Mary Had a Little Lamb"	"Merrily We Roll Along" #23
"Good King Wenceslas"	"Good King Wenceslas" #26
"Jolly Old Saint Nicholas"	"Jolly Old Saint Nicholas" #32
"Sweetly Sings the Donkey"	"Sweetly Sings the Donkey" #37
"Jingle Bells"	"Jingle Bells" p.12
"Twinkle, Twinkle Little Star"	"Star Search #60

Note: The researcher replicated experimental group melodies using MuseScore. "Free Music Composition and Notation Software," MuseScore, accessed March 27, 2024, https://musescore.org/en.

Preparatory Data Collection

A week before the study began, the researcher administered the ITML T1, ITML T2, and the IMMA TS pre-tests. This pre-testing occurred over two days, with the ITML T1 and ITML T2 administered on a Wednesday and the IMMA TS on Friday of the same week. The researcher designed this testing schedule based on homeroom sections and divided it into three thirty-minute blocks from 9:00 a.m. to 10:30 a.m. The testing for all fourth-grade students occurred from 9:00 to 9:30 a.m., followed by the first section of fifth-grade students from 9:30 to 10:00 a.m., and the second section of fifth-grade students from 10:00 to 10:30 a.m. The paper and

pencil tests took place in a quiet room with sufficient airflow, lighting, and chairs. Students received a No. 2 pencil and a lapboard to record their answers. The researcher played prerecorded directions for the ITML T1 and T2 subtests through a sound system with a compact disc player and wall-mounted speakers. Printed directions for the IMMA TS assessment, as outlined in the *Manual for the Primary Measures of Music Audiation (Kindergarten-Grade 3) and the Intermediate Measures of Music Audiation (Grade 1-Grade 6)*, were read to the students by the researcher.[16]

The ITML T1 and T2 pre-tests were scheduled for Wednesday, starting at 9:00 a.m. Each test lasted approximately twelve minutes, for an approximate total of twenty-four minutes. The researcher gave each student a lapboard, an answer sheet, and a No. 2 pencil. The tonal music achievement tests were described, and the students were encouraged to perform to the best of their ability. Next, they were told to write their name, grade, and homeroom teacher's name at the top of the answer sheet. The researcher explained that only the first two sections on the first page of the answer sheet would be utilized, stressing that the test did not cover the backside. Lastly, the students were instructed to listen attentively to the recorded directions, wait until the listening excerpt was performed twice before marking answers, and erase any mistakes thoroughly. After following these instructions, the students were given two practice questions before starting the test.

Subtest one (T1) evaluated aural recognition by requiring students to distinguish between major and minor excerpts. They were instructed to mark a capital "M" for major, a lowercase "m" for minor, or a question mark "?" if unsure. Each excerpt was played twice, and students

[16] Edwin E. Gordon, *Manual for the Primary Measures of Music Audiation (Kindergarten-Grade 3) and the Intermediate Measures of Music Audiation* (Grade 1-Grade 6) (Chicago, IL: GIA, 1986), 33.

were advised to mark their answer sheets after hearing it twice. This section comprised twenty-two questions and lasted approximately twelve minutes. Subtest two (T2) focused on reading recognition. The recorded instructions directed students to listen to a tonal excerpt and determine if it matched the notation on their answer sheet. They were told to select "Y" for yes if they believed it matched, "N" for no if they disagreed, or "?" if uncertain. This section comprised twenty-two questions and took approximately twelve minutes to complete (See Appendix M).

The IMMA TS occurred on Friday of the same week. The complete IMMA TS testing procedure includes the administration of tonal and rhythm audiation tests; however, only the tonal test was employed for this research project. The tonal test comprised forty questions, with four practice examples provided. Students did not need to know how to read words or music notation. The researcher gave each student a lapboard, an answer sheet, and a No. 2 pencil. They were informed they would take a music aptitude test and encouraged to do their best. Next, they were instructed to print their name, grade, and homeroom teacher's name at the top of the answer sheet. Additionally, the researcher informed the students that both sides of the testing sheet would be used, and they would need to flip it over halfway through to record their answers.

The researcher read the IMMA TS testing directions aloud to the students, emphasizing they should refrain from marking any answers until instructed. Each test question presented two melodic excerpts for the students to decide if they were identical or different. To indicate their response, students circled either a pair of smiling faces if they believed the excerpts were identical or a smiling face and a frowning face if they perceived them as different. Following these instructions (see Appendix N), the researcher initiated the assessment by playing the compact disc. Students completed four practice questions as directed, selecting a corresponding picture based on what they heard. The recording played continuously until the end of the forty-

question test. To facilitate the process, the recording was synchronized to provide five seconds between questions, allowing students time to draw each circle. Throughout the test administration, the instructor supervised the students by walking around the room.

Treatment

Before the study commenced, all participants underwent a series of weekly introductory lessons for two weeks. The researcher designed these sessions to equip the beginning band students with essential skills, including instrument assembly and maintenance, embouchure formation, proper instrument handling, posture, and initial sound production. The researcher divided the students into control or experimental groups to ensure consistency in learning expectations, rules, instrument handling procedures, and care instructions. The sessions occurred over two consecutive Tuesdays, with thirty-minute sessions organized by instrumentation: clarinets from 8:30 to 9:00 a.m., flutes from 9:00 to 9:30 a.m., trumpets from 9:30 to 10:00 a.m., and trombones from 10:00 to 10:30 a.m.

The research study began after the students finished the ITML T1, ITML T2, and IMMA TS pre-tests and participated in the two introductory sessions. Over the subsequent nine weeks, the researcher administered homogeneous group lessons to beginning band students randomly assigned to an experimental or a control group. Instrumental group lessons were conducted once weekly for twenty minutes, as detailed in Table 7. These sessions occurred in the music room every Tuesday from 8:30 a.m. to 11:10 a.m. Resources, including a whiteboard, Smart Board, CD player, speakers, chairs, and music stands, were available for instructional purposes.

Table 7. Weekly Lesson Schedule: Groups E & C

Tuesdays Instrumental Group Lesson Schedule	
8:30-8:50: Emerald: 3 Flutes	9:50-10:10: Cobalt: 3 Flutes
8:50-9:10: Emerald: 8 Clarinets	10:10-10:30: Cobalt: 7 Clarinets
9:10-9:30: Emerald: 5 Trumpets	10:30-10:50: Cobalt: 5 Trumpets
9:30-9:50: Emerald: 6 Trombones	10:50-11:10: Cobalt: 6 Trombones

Note. The schedule rotated, with the last group lesson each week moving to the first lesson slot the following week.

Instructional materials for the experimental and control groups included eight researcher-selected melodies from the *Standard of Excellence: Comprehensive Band Method: Book One*. The control group followed a traditional instructional approach using the method book, whereas instruction for the experimental group employed vocalization techniques. These techniques included chanting "bum," singing and signing solfège syllables and lyrics, and "singering." When echoing was required, the instructor prepared the students either by vocalizing the melody's tonality with "bum, bum, bum, ready sing" (see Figure 1) or by instructing them to "repeat after me."[17] Because of the limited twenty-minute lesson duration, each weekly session adhered to a streamlined and efficient process consisting of six sequential activities:

1. Students echoed the teacher as she chanted the song's rhythm using the word "bum" while patting their laps to the macro beat.
2. While maintaining the macro beat, students echoed as the teacher sang the melody using the neutral syllable "bum" (aural/oral mode). The teacher established key, tonality, meter, and tempo through a "Tune-Up" procedure, which included finding

[17] Richard E. Grunow, Edwin E. Gordon, and Christopher D. Azarra, *Jump Right In Instrumental Series: For Winds and Percussion: Book 1 and 2* (Chicago, IL: GIA Publications, 2001), 280.

the resting tone on the keyboard or instrument followed by singing a descending "sol-mi-do" arpeggio on the neutral syllable "bum" (see Figure 1).

3. The teacher sang the song's melody using solfège syllables and hand signs, employing a whole-parts-whole method. Students echo-sang and solfège-signed phrase-by-phrase until they were able to sing the entire song.
4. Students learned to finger and sing the notes of the song as the instructor demonstrated the fingering for each note and sang the pitches using solfège syllables. This process, combining fingering and singing, is called "singering."
5. The teacher modeled playing the melody on the instrument, guiding students through a transition from ear-to-hand coordination as they imitated the teacher. This instructional approach advanced phrase-by-phrase until students mastered the entire song.[18]

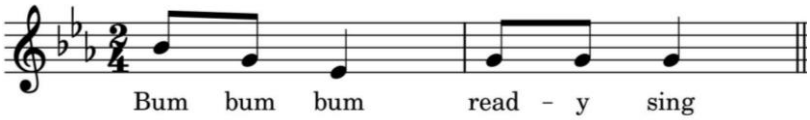

Figure 1. "Tune-Up" Example in Duple Meter Starting on "Mi." Image created in MuseScore. The instructor first played the resting tone on her instrument to establish tonality.

The instructional strategy maintained a consistent, structured format throughout each subsequent lesson, with each session expanding upon the material covered in the previous week. The researcher guided the students to audiate, mentally sing, and visualize their fingerings as they listened. The lessons adhered to the following steps:

[18] Ann M. Musco, "Playing by Ear: Is Expert Opinion Supported by Research?," *Bulletin of the Council for Research in Music Education*, no. 184 (2010): 49, https://doi.org/10.2307/27861482.

1. The teacher reviewed the song learned in the previous week by first singing and signing the solfège syllables together with the students.
2. After reviewing the song, the instructor taught the lyrics, and students independently performed it on their instruments. The process first involved echo-chanting the lyrics in the melodic rhythm of the song with a neutral syllable, "bum." This chanting process helped students learn the lyrics by echo-singing phrase by phrase.
3. Students sang the entire song using the lyrics while simultaneously challenging themselves to finger the notes as they sang.
4. The instructor challenged students to play the reviewed song on their instrument and, when time permitted, encouraged them to audiate and perform independently.
5. The instructor introduced a new song following the procedures from the first lesson.

During the fifth week, supplemental music sheets introducing notation to the previously learned songs were provided (see Appendix Q). Melodies selected for their singable style and ease of learning were all in the key of B flat major. The traditional repetitive folk song style and memorable lyrics ensured an engaging and achievable learning experience. Teaching focused on introducing the solfège syllables "do," "re," and "mi" and gradually adding "fa," "sol," and "la" in subsequent weeks. Weeks six through eight emphasized reviewing and performing the first six notes of the B flat major scale, with week nine devoted to reviewing assigned melodies (see Table 8).

Table 8. Weekly Note Introduction: Groups E & C

Week	Experimental Group Notes (Solfège)	Control Group Notes (Concert Pitch)
1	"Hot Cross Buns" (do, re, mi)	"Hot Cross Buns" (Bb, C, D)
2	"Little Friend Pierrot" (do, re, mi)	"Au Claire de la Lune" (Bb, C, D)
3	"Mary Had a Little Lamb" (do, re, mi, sol)	"Merrily We Roll Along" (Bb, C, D, F)

Table 8. Continued, Weekly Note Introduction: Groups E & C

Week	Experimental Group Notes (Solfège)	Control Group Notes (Concert Pitch)
4	"Good King Wenceslas" (do, re, mi, fa, sol)	"Good King Wenceslas" (Bb, C, D, Eb, F)
5	"Jolly Old St. Nicholas" (do, re, mi, fa, sol, la)	"Jolly Old St. Nicholas" (Bb, C, D, Eb, F, G)
6	"Sweetly Sings the Donkey" (do, re, mi, fa, sol, la)	"Sweetly Sings the Donkey" (Bb, C, D, Eb, F, G)
7	"Jingle Bells" (do, re, mi, fa, sol)	"Jingle Bells" (Bb, C, D, Eb, F, G)
8	"Twinkle, Twinkle Little Star" (do, re, mi, fa, sol, la)	"Twinkle, Twinkle Little Star" (Bb, C, D, Eb, F, G)

The control group followed the instructional method outlined in the *Standard of Excellence: Comprehensive Band Method: Book One*. The researcher focused on teaching note names and their location on the music staff. This method involved visually identifying pitch letter names, recognizing fingerings or slide positions, and performing instrumentally by reading notes and time values. During five weeks, the researcher introduced concert pitches B flat, C, D, E flat, F, and G, employing mnemonics and terms such as "whole-note," "half-note," and "quarter-note" to facilitate rhythm instruction. Through this process, students became proficient in counting whole, half, and quarter notes within 4/4 and 3/4-time signatures. Differences in melody performance instructions between control and experimental groups are outlined in Table 9.

Table 9. Comparative Melodic Instruction Styles

Control Group	Experimental Group
1. Participants echoed the instructor chanting the rhythms on "bum.	1. Participants counted using the traditional system, "one + two + three + four +."
2. Participants echoed the instructor singing the melodies on "bum."	2. Participants attempted to play the melody.
3. Participants echoed the instructor, singing the melodies in Solfège.	3. Instructor reviewed note names with instrument-specific clef mnemonics.
4. Participants "singered" the notes on their instruments as they sang the solfège notes.	4. Participants repeated and memorized the mnemonic.
5. Participants echoed the instructor playing the melody on the instrument phrase by phrase.	5. The instructor reviewed note values and rhythms, prompting students to count rhythmically along with the melody.
6. Participants independently played the melody on their instruments.	6. Participants listened to the instructor play the melody before attempting it themselves.

Post-Experiment Data Collection

After completing the nine-week treatment period, all beginning band students underwent post-testing procedures similar to the pre-tests to maintain consistency in the evaluation process. The researcher organized the students by homeroom assignments and scheduled them over two days for thirty-minute blocks to complete the ITML (T1 and T2) and the IMMA TS. The Level 1 Audiation/Listening (ITML T1) and Level 1 Audiation/Reading (ITML T2) post-tests occurred Tuesday morning. Similarly, the IMMA TS post-test was conducted on Friday morning of the same week. Each test followed the same schedule, environment, and procedures as the pre-tests, conducted in the music classroom between 9:00 a.m. and 10:30 a.m. The researcher ensured the

students had a quiet, well-lit, ventilated setting. The students were given a No. 2 pencil, answer sheet, and lapboard.

Scoring

After administering the post-tests, the researcher manually scored all pre- and post-test ITML T1 and ITML T2 answer sheets, entering the scores into a password-protected Excel spreadsheet. Next, the researcher hand-scored the IMMA TS pre- and post-tests and recorded the raw scores in a separate tab of the same protected Excel spreadsheet. Raw scores (RS), indicating the number of correctly answered questions, were used for scoring purposes on all pre- and post-tests. The pre-test scores were kept undisclosed to the researcher until the experimental research project and post-testing procedures were completed. Subsequently, the researcher analyzed the post-test data using independent samples *t*-tests to understand how the treatment influenced the mean post-test scores within each group. Additionally, paired *t*-tests were employed to compare the mean change scores from pre- to post-test results within the experimental and control groups. The data analysis was conducted using IBM® SPSS Statistics version 29.

Data Analysis

In this analysis, the independent variables were the instructional techniques used to teach the participants. The experimental group learned to perform melodies through chanting and singing without notation, while the control group learned to play the songs using notation on the music staff. After the treatment, the researcher collected, tabulated, and entered pre- and post-test scores from the IMMA TS, ITML T1, and ITML T2 standardized tests for the forty-three participants into the IBM® SPSS Statistics version 29 software program. To compare the post-

test mean scores of the two groups, the researcher employed independent samples *t*-tests to assess the effectiveness of the treatment on the experimental group. Additionally, paired *t*-tests were utilized to compare mean gain scores between the subjects' IMMA TS, ITML T1, and ITML T2 pre- and post-test scores. Initially, the significance level was set at $p < .05$. However, to mitigate the risk of Type 1 error, the researcher applied the Bonferroni correction, adjusting the significance level to 0.017 by dividing 0.05 by the three comparisons made. Further tests and analyses are outlined in "Chapter Four: Results."

Insights from *t*-Tests in Music Education Research

In this control-group experimental study, the researcher found the *t*-test the most suitable method for analyzing and comparing data due to the smaller sample size. Specifically, the comparison centered on the IMMA TS aptitude scores and the ITML T1 and ITML T2 achievement scores. The researcher employed *t*-test statistical analysis to compare the mean post-test scores between two distinct groups of beginner band students.

Various research studies utilizing *t*-test analyses provided valuable insights that informed this investigation. For example, Thomas examined how aural instruction involving singing, chanting, and instrument playing affected the discrimination abilities of second-grade students. She employed paired *t*-tests to compare pre- and post-test scores on tonal, rhythm, and composite measures from the PMMA tonal and rhythm subtests.[19] Similarly, Haston conducted a study to compare mean scores on the Musical Aptitude Profile (MAP) between two groups of wind

[19] Karen Sanders Thomas, "The Effect of Aural Instruction with Tonal and Rhythm Patterns from Edwin Gordon's Music Learning Theory on the Aural Discrimination Abilities of Second-Grade Students," (PhD diss., The University of North Carolina at Greensboro, 2016), https://libres.uncg.edu/ir/uncg/f/Thomas_uncg_0154D_11906.pdf.

instrumentalists. The study assessed differences in sight-reading abilities based on whether the groups were taught with a visual or aural emphasis, using separate *t*-tests for the comparisons.[20]

Over twelve weeks, Sommerville investigated how audiation instruction affected students' understanding and interpretation of musical notation. He divided participants into four groups, each receiving different types of instruction to evaluate the role of decoding. By analyzing pre- and post-test scores from the Melodic Echo Test (MET) with a paired *t*-test, he found significant improvements in echo-singing abilities.[21]

O'Donnell's fourteen-week study focused on implementing elements of Gordon's music learning theory (MLT) within his instructional approach. The experimental group received tonal and rhythm pattern training, while the control group underwent alternative instructional methods. Paired *t*-tests were used to compare pre- and post-test scores on the Advanced Measures of Music Audiation (AMMA), providing insights into the potential effects of these differing instructional approaches.[22]

t-Test Assumptions

By illustrating concrete *t*-test examples in the preceding section, the researcher gained a practical understanding of how *t*-tests are applied in statistical analysis. This served as a foundation for the subsequent examination of *t*-test assumptions, allowing the researcher to

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[20] Haston, "Comparison of a Visual and an Aural Approach," 215.

[21] Christopher Sommervelle, "Thinking in Sound: A Survey of Audiation in Australian Music Students," (PhD diss., The University of Melbourne, 2016), 72, file:///D:/Liberty%20U/Dissertations/Thinking%20in%20Sound_A%20Survey%20of%20Audiation%20in%20Australian%20Music%20Students_SOMMERVELLE%20PhD%20THESIS%20upload.pdf.

[22] Christian O'Donnell, "An Investigation of the Effect of Instruction in Edwin Gordon's Tonal and Rhythm Patterns on Secondary Students' Advanced Measures of Music Audiation Scores," (PhD diss., University of Oklahoma, 2011).

comprehend the necessity of these assumptions in ensuring the validity and reliability of statistical conclusions.

To ensure adequate statistical power for addressing the research questions, the researcher selected a medium effect size of 0.5 and a significance level (α) of 0.05. Given these parameters and applying a Bonferroni correction to control for multiple comparisons (adjusted $\alpha = 0.017$), the study required a minimum sample size of forty-three participants ($N = 43$) to detect the anticipated effects with 50% power. Before the analysis, the researcher performed assumption tests to verify the data met the required criteria. Table 10 details the six assumptions of *t*-tests that require evaluation. The prerequisites for assumptions one, two, and three were met after the researcher confirmed the dependent variable was measured using a continuous scale, the independent variable consisted of two categorical, independent groups, and each group had distinct participants. Following this confirmation, the researcher employed IBM® SPSS Statistics software to analyze the data for assumption tests four, five, and six. This analysis addressed assumptions related to normality, homogeneity of variances, and management of outliers.

Table 10. Assumptions of *t*-Tests

t-Test Assumptions	
Assumption #1	The dependent variable must be measured using a continuous scale.
Assumption #2	The independent variable should consist of two categorical, independent groups.
Assumption #3	Observations should be independent, meaning no relationship exists between observations within or between groups. Each group should have distinct participants, with no participant belonging to more than one group.
Assumption #4	There should be no significant outliers to compromise result validity.
Assumption #5	The dependent variable's distribution within each independent variable group should approximate normality, though exact normality is not necessarily due to the *t*-test's robustness. The Shapiro-Wilk test of normality can assess this assumption.

Table 10. Continued, Assumptions of *t*-Tests

t-Test Assumptions	
Assumption #6	Homogeneity of variances is required. Levene's test for homogeneity of variances in SPSS Statistics can evaluate this assumption.

Source: Laerd Statistics, "Assumptions," SPSS Statistics Tutorials and Statistical Guides | Laerd Statistics, accessed March 17, 2024, https://statistics.laerd.com/premium/spss/istt/independent-t-test-in-spss-7.php.

After confirming that all prerequisites for conducting the *t*-test were met, including measures of central tendency, the researcher employed an independent samples *t*-test to identify potential significant results among the IMMA TS, ITML T1, and ITML T2 post-test scores. Interpreting the output required the examination of five main statistical components:

1. Descriptive Statistics: These are summary statistics, including the means and standard deviations for each group compared.

2. Test Statistic (*t*-value): This numerical value represents the difference between the means of the two groups relative to the variation within the groups.

3. Degrees of Freedom (*df*): *df* indicates how many values a statistical calculation can vary freely. It is crucial for determining critical values and calculating *p*-values, essential for hypothesis testing and drawing conclusions from data.

4. *P*-value: This refers to the probability value that indicates the likelihood of observing the obtained results if the null hypothesis, or no difference between the groups, is true. The *p*-value assists researchers in determining whether the observed difference is statistically significant.

5. Effect Size: Effect Size measures the size of the difference between the two groups, showing how meaningful the results are.[23]

This study calculated Cohen's *d* to quantify the effect size between the two groups within this study. The effect size for Cohen's *d* is reported as either small ($d = 0.2$), medium ($d = 0.5$), or large ($d = 0.8$). It is calculated by dividing the difference between two means by the standard deviation of the data. This measure indicates the size of the mean difference by comparing it to

[23] Jim Frost, "Cohens D: Definition, Using & Examples," Statistics by Jim, last modified June 27, 2022, https://statisticsbyjim.com/basics/cohens-d/.

the data's variability. Cohen's *d* is the correct way to measure effect size when the two groups have similar standard deviations and are of the same size. Including Cohen's *d* as a measure helps researchers and readers understand the practical significance of the findings beyond just statistical significance.[24]

The statistical analysis used in this study to determine significance was the *p*-value. In contrast, the *t*-value helped assess the difference between the means of the two independent samples, comparing them to the critical Bonferroni correction value of $\alpha = 0.017$. The calculation to derive this correction value involved dividing the significance level of 0.05 by the number of post-test comparisons (three in this study). The researcher examined the *t*-test results for each dependent variable to identify significant differences in the post-test IMMA TS, ITML T1, and ITML T2 mean scores between the experimental and control groups. In the experimental and control groups, the researcher evaluated the post-test means scores for IMMA TS, ITML T1, and ITML T2 to measure aptitude, tonal listening, and tonal reading audiation abilities. The analysis revealed nonsignificant differences between the control and experimental groups for IMMA TS and ITML T1; however, significance was identified in the post-test mean score for ITML T2.

Before the experimental study began, the researcher determined baseline scores for Tonal Aptitude, Audiation/Listening, and Audiation/Reading by administering the IMMA TS, ITML T1, and ITML T2 pre-tests. After the nine-week study, these tests were administered again to collect new data showing potential growth and to compare the mean change scores between the control and experimental groups using paired *t*-tests. The independent samples t-test analysis results at the 95% confidence level indicated no significant difference found for RQ1 and RQ2

[24] Jim Frost, "Cohens D: Definition, Using & Examples," Statistics by Jim, last modified June 27, 2022, https://statisticsbyjim.com/basics/cohens-d/.

based on the IMMA TS and ITML T1 results. Therefore, the null hypotheses for RQ1 and RQ2 were not rejected. However, the results of ITML T2 showed significance, leading to the rejection of the null hypothesis for RQ3.

Summary

This study aimed to investigate the impact of vocalization techniques on the music achievement and aptitude of fourth and fifth-grade beginning band students. Using a quantitative, experimental, two-group post-test design, the researcher employed convenience sampling to select participants and categorize them into either an experimental or control group for instructional comparison. The instructional methods differed between groups, with the experimental cohort receiving instruction emphasizing vocalization through a sound-before-symbol technique, whereas the control group adhered to traditional note-reading methods.

The investigational process began with introductory instrumental group lessons, covering instrument assembly, proper holding techniques, initial sound production, and correct breathing techniques. Subsequently, pre-tests were administered to gather data for later paired *t*-test analyses. Before the formal experiment, students were divided into experimental and control groups based on their instrumentation. The experimental group received instruction using a vocalization strategy emphasizing sound-before-sight without notation. The control group followed a note-by-note instructional strategy utilizing a method book.

Instruction for the experimental group included elements from Gordon's empirical model of music learning theory, focusing on sound-before-sight techniques. Rather than initially learning specific notes, students were taught to sing, chant, sing solfège syllables, and "singer" with teacher modeling. At the outset, songs were introduced in a call-and-response format. The researcher began by chanting and singing using "bum," solfège syllables, and eventually

transitioned to singing with the lyrics. The researcher introduced an exercise called “singering,” where students sang solfège syllables while fingering the corresponding notes simultaneously. This exercise helped students associate solfège syllables with specific fingerings. Once proficient, they gradually learned notation and fingering placement from visual charts. By week five, students in the experimental group were introduced to researcher-created exercises that incorporated notation, solfège, and lyrics on the staff lines. This approach helped them connect songs, solfège, and notation visually.

The instructional approach for the control group followed the structured method outlined in the *Standard of Excellence: Comprehensive Band Method: Book One*. This approach systematically introduced individual fingerings, pitches, and rhythm symbols as they appeared in selected notated melodies. During the study, the researcher demonstrated how notes should be fingered and sound on the instruments but did not employ vocalization activities.

Chapter Four: Research Findings

Overview

This chapter presents the outcomes of assumption tests and data analyses performed on pre- and post-test results from forty-three beginning band students. Participants were categorized into two treatment groups: experimental and control. Both groups were taught the identical set of eight melodies from the *Standard of Excellence: Comprehensive Band Method: Book One*, with each group receiving different instructional treatments. Gain scores from post-test results of the IMMA TS, ITML T1, and ITML T2 were analyzed to assess the impact of differing interventions on the progress of beginning band students. The researcher conducted effect size analyses to evaluate the intervention's impact further. These analyses used pre- and post-test data, employing paired *t*-tests to assess the differences. The effect sizes measured the magnitude of the intervention's impact, providing a clearer understanding of the practical implications of the observed effects beyond statistical significance.

The experimental group was instructed through vocalization and audiation techniques, incorporating elements from Gordon's music learning theory (MLT) skill-learning sequence. Before learning to play a song independently on their instruments, the students were guided through a sequential five-step process involving listening, chanting, solfège signing, "singering," and echo-playing. The control group followed the instructional method outlined in the *Standard of Excellence: Comprehensive Band Method: Book One*, which focused on a note-by-note instructional method. This approach involved visually identifying note names, counting the rhythmic patterns of the melodies, recognizing fingerings or slide positions, and performing the song by reading notes and time values.

At the start of the nine-week study, all participants completed pre-tests to assess their music aptitude and ability to understand and interpret tonal concepts related to audiation. Participants were randomly assigned to the experimental or control group, each receiving a different instructional intervention. After nine weeks, post-tests were administered to evaluate the effects of the differing treatments on music aptitude and understanding of tonal concepts between the two groups. Data from three standardized tests (IMMA TS, ITML T1, and ITML T2) for all forty-three participants were compiled and analyzed using IBM® SPSS Statistics version 29. This software facilitated assumption tests and provided insights into the relationships between the independent and dependent variables, including running independent *t*-tests and paired *t*-tests.

Research Questions and Hypotheses

RQ1: Is there a difference in Intermediate Measures of Music Audiation – Tonal Subtest (IMMA TS) music aptitude post-subtest scores between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

RQ2: Is there a difference in Level 1—Audiation/Listening—Tonal Aural (T1) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

RQ3: Is there a difference in Level 1—Audiation/Reading—Tonal Reading (T2) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

$H_0$1: There is no difference in Intermediate Measures of Music Audiation – Tonal Subtest (IMMA TS) music aptitude post-subtest scores between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices).

$H_0$2: There is no difference in Level 1—Audiation/Listening—Tonal Aural (T1) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices).

$H_0$3: There is no difference in Level 1—Audiation/Reading—Tonal Reading (T2) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices).

Measures of Central Tendencies

In research, measures of central tendency are essential statistical tools for describing and summarizing data meaningfully and validly.[1] These measures, such as the mean or median, provide a single value that represents the entire data distribution.[2] Table 11 compares the mean values for each assessment administered in the experimental and control groups before and after the nine-week study. The experimental group showed a more noticeable improvement in change scores compared to the control group. Based on this difference in change scores, it is reasonable

[1] William J. Lammers and Pietro Badia, *Fundamentals of Behavioral Research* (Belmont, NY: Wadsworth Publishing Company, 2005), 2, https://uca.edu/psychology/files/2013/08/Ch10-Experimental-Design_Statistical-Analysis-of-Data.pdf.

[2] Prabhaker Mishra et al., "Descriptive Statistics and Normality Tests for Statistical Data," *Annals of Cardiac Anaesthesia* 22, no. 1 (March 2019): 72, https://doi.org/10.4103/aca.ACA_157_18.

to assume that the intervention applied to the experimental group may have considerably impacted the measured outcome more than the control group. This observation suggests that the sound-before-sight treatment likely had a more positive effect than the traditional instructional method in this study.

Table 11. Central Tendencies: Mean Change Scores Group E vs. Group C

	Experimental			Control		
Variable	N	*M*	*SD*	*N*	*M*	*SD*
IMMA TS Pre	18	34.11	2.80	21	33.76	2.86
IMMA TS Post	18	35.78	2.35	21	34.10	3.03
Change Scores		1.67			0.34	
ITML T1 Pre	22	14.91	3.09	19	15.37	2.69
ITML T1 Post	22	16.18	3.19	19	16.05	3.02
Change Scores		1.27			0.68	
ITML T2 Pre	20	15.20	2.83	21	14.95	2.67
ITML T2 Post	20	18.70	1.75	21	16.86	2.56
Change Scores		3.5			1.91	

Assumption Tests

In this quantitative, experimental study with a two-group pre- and post-test design, the researcher aimed to assess the effectiveness of different instructional strategies on music aptitude and understanding of tonal concepts. Before conducting statistical analyses, the researcher performed assumption testing to identify and rectify potential violations that may have led to inaccurate findings. The researcher tested six assumptions to ensure the appropriateness of the

independent-samples *t*-test and paired-sample *t*-tests. This process helped detect discrepancies in the data and find solutions to ensure the validity of the findings.[3]

Assumptions One, Two, and Three

The researcher identified and addressed the first three assumptions without using SPSS Statistics. The first assumption requires that the dependent variable be measured continuously. In this study, continuous data were obtained by collecting pre- and post-test participant scores using the IMMA TS, ITML T1, and ITML T2 music aptitude and achievement tests. The second assumption specifies that the study must use two categorical, independent groups. This assumption was met by dividing the participants into control and experimental groups. The third assumption states that each group must consist of different participants, with no individual belonging to more than one group. The researcher randomly assigned forty-three participants into one of two groups: twenty-two students to the experimental group and twenty-one students to the control group.

Assumption Four

The analysis of assumption four, which requires the absence of significant outliers, revealed the presence of certain outliers. Outliers are single data points within the complete data set that do not follow the usual pattern. These outliers can negatively impact results by dramatically influencing the mean and standard deviation, thus affecting their validity.[4] Addressing outliers can potentially improve the normality of the data distribution, enhancing the

[3] Laerd Statistics, "Independent *t*-Test Using SPSS Statistics," SPSS Statistics Tutorials and Statistical Guides | Laerd Statistics, accessed March 17, 2024, https://statistics.laerd.com/spss-tutorials/independent-t-test-using-spss-statistics.php.

[4] Laerd Statistics, "Assumptions."

validity of statistical analyses. However, managing outliers is challenging due to the lack of definitive guidelines. Researchers must carefully assess the specific conditions of the study to determine an appropriate action. Generally, retaining outliers is preferred unless they are considered incorrect. Removing outliers can introduce bias and compromise the accuracy of conclusions.[5] It is crucial to document any removed outliers in the analysis.

Managing Outliers

The researcher employed IBM® SPSS Statistics version 29 to identify outliers by following this sequential approach: Navigate to the "Analyze" menu, select "Descriptive Statistics," choose "Explore," and then under the "Statistics" options, select "Outliers." Following this process, the SPSS Statistics program detected seven outliers in four of the six administered pre- and post-tests, impacting the normality assumption.

The IMMA TS pre-test revealed one outlier in each group: Participant Forty-Two in the experimental group and Participant Twenty-Eight in the control group, with low scores of 20 (see Figure 2). The IMMA TS post-test showed that Participant Thirty-Six from the experimental group had a low score of 27 (see Figure 3). The ITML T1 pre-test for the control group identified two outliers: Participant Two had a notably high score of 22, and Participant Thirty-Four had a low score of 7 (see Figure 4). The ITML T2 post-test for the experimental group indicated that Participant Twenty-Six had a low score of 12 (see Figure 5). Q-Q Plot analysis revealed that Participant Forty-Two, with a low score of 13, also affected normality (see Figure 6).

[5] Pritha Bhandari, "How to Find Outliers | 4 Ways with Examples & Explanation," Scribbr, last modified June 21, 2023, https://www.scribbr.com/statistics/outliers/.

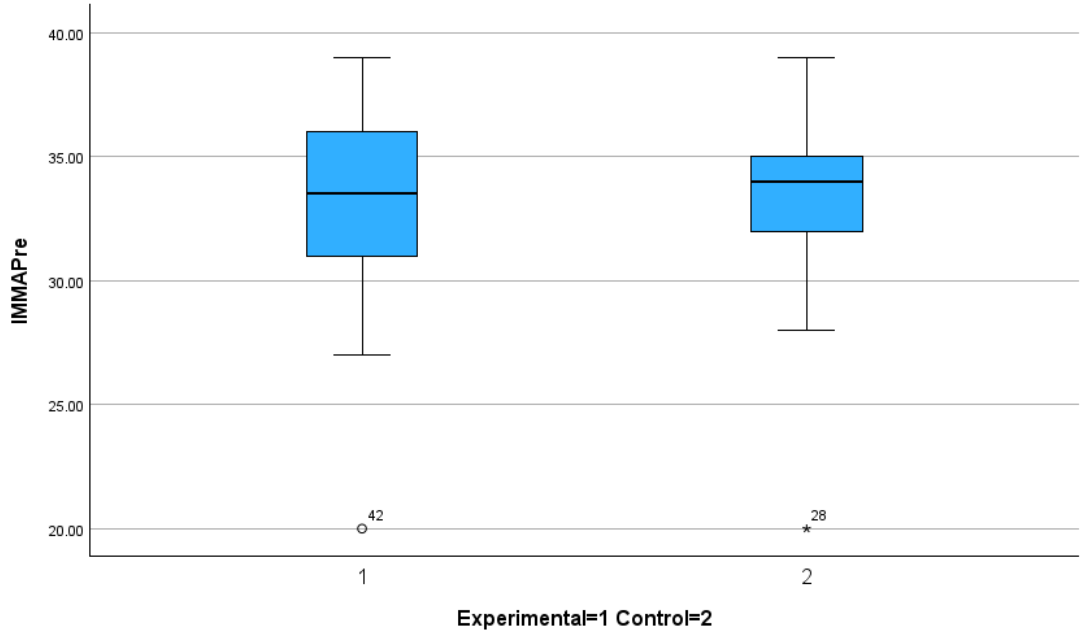

Figure 2. Boxplot Analysis IMMA TS Pre-Test Scores. This figure highlights Participant 42 from the experimental group and Participant 28 from the control group as outliers.

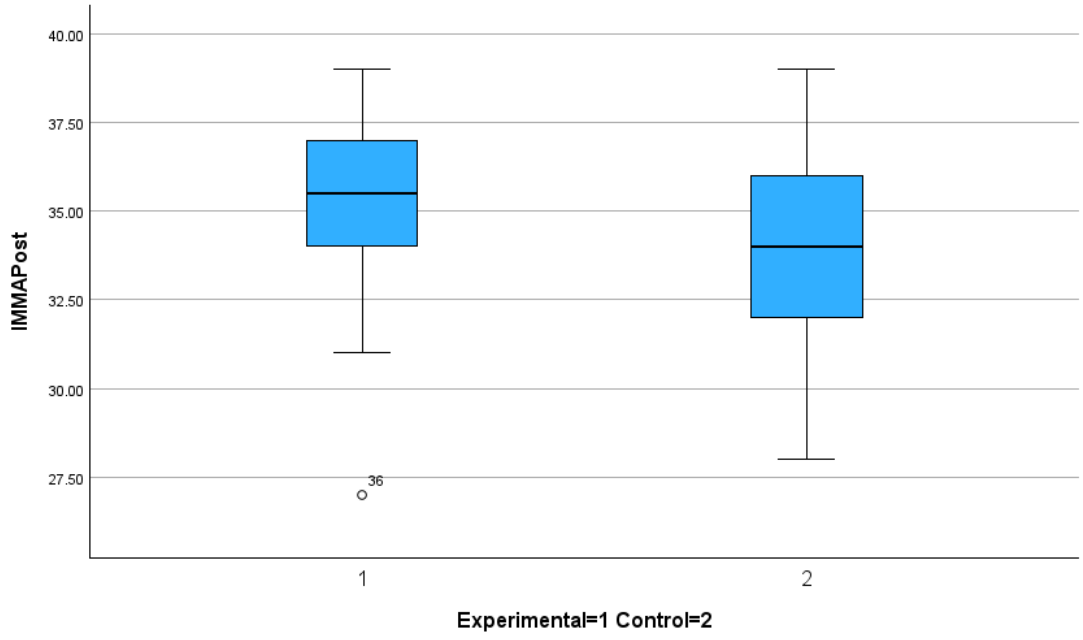

Figure 3. Boxplot Analysis: IMMA TS Post-Test Scores. Participant 36 from the experimental group is highlighted as an outlier in this figure.

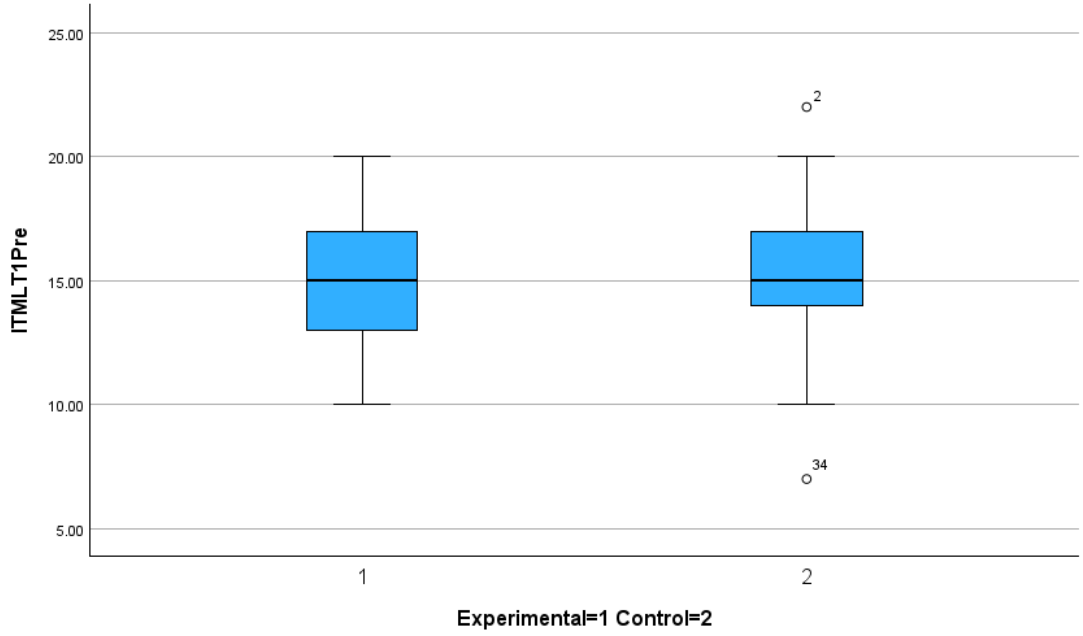

Figure 4. Boxplot Analysis: ITML T1 Pre-Test Scores. This figure highlights the ITML T1 pre-test scores from Participants 2 and 34 from the control group as outliers.

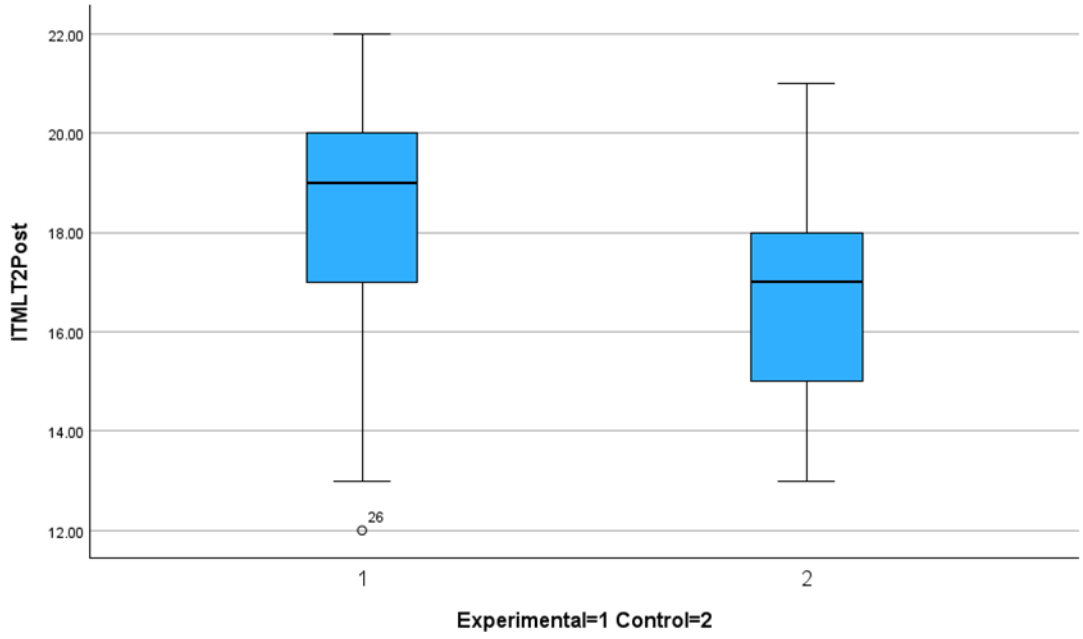

Figure 5. Boxplot Analysis: ITML T2 Post-Test Scores. This figure highlights the ITML T2 post-test scores from Participant 26 from the experimental group as an outlier.

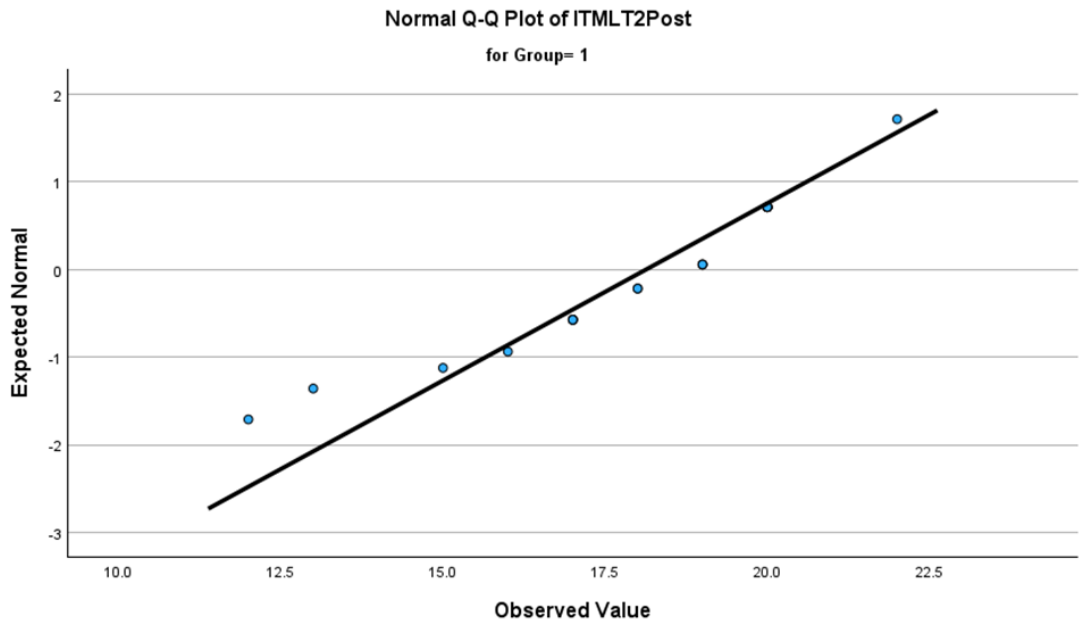

Figure 6. Q-Q Plot Analysis: ITML T2 Post-Test Scores. The Q-Q plot analysis confirmed Participant 26 from the experimental group as an outlier.

Histograms, Q-Q Plots

Confirming normality is crucial for selecting the appropriate statistical method. Therefore, the researcher conducted two separate SPSS statistical tests for normality to generate descriptive statistics: one using the entire data set and another with the outliers removed. An analysis of histograms followed this to assess the standard curve and an examination of Q-Q plots to confirm the normal distribution, indicated by points aligning approximately along a straight line. Figures 7 through 18 depict the histograms and Q-Q plots after removing outliers. These figures visually represent the normality for each test administered, categorized into experimental and control groups.

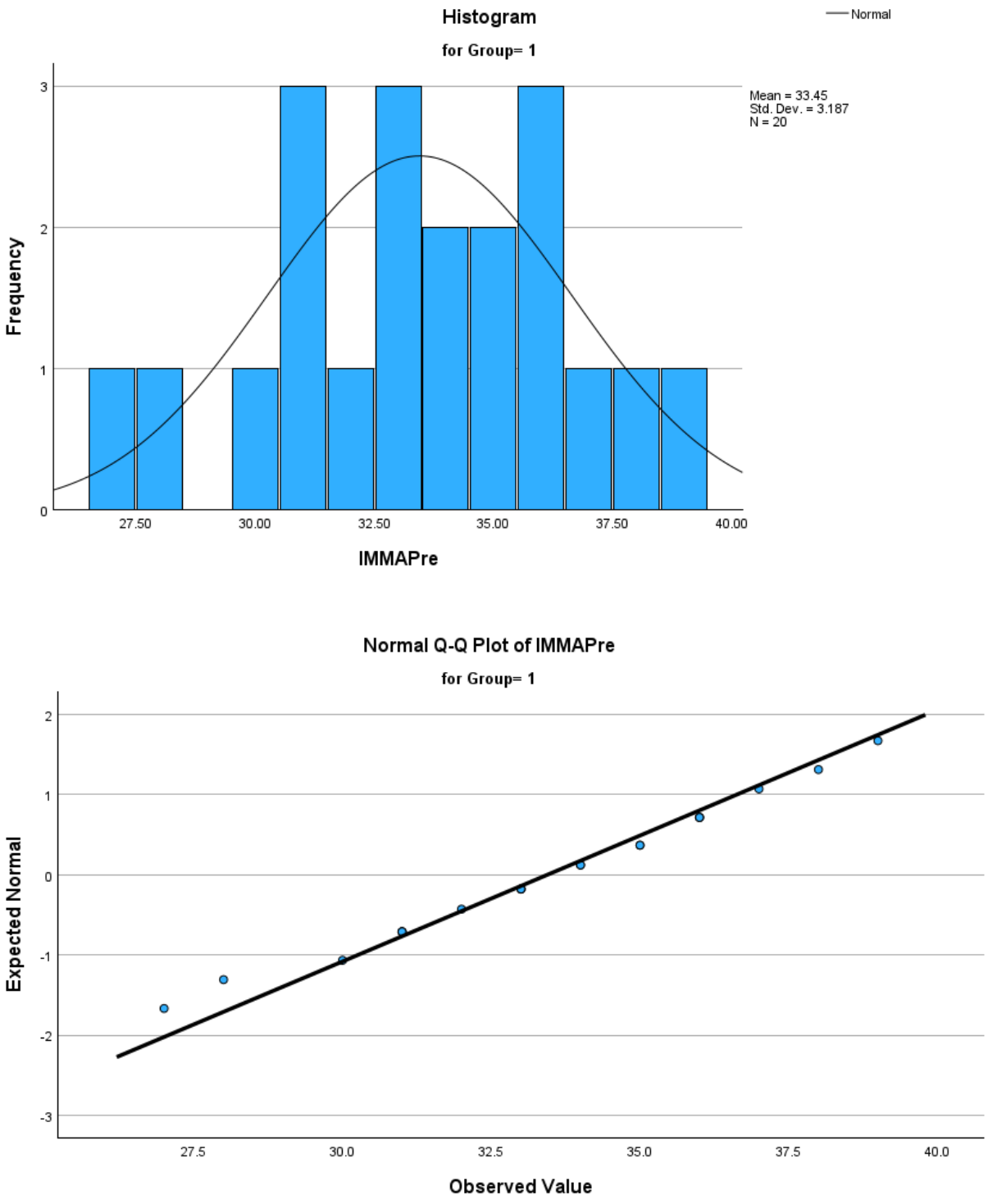

Figure 7. Histogram & Q-Q Plots: Group 1 (Exp.) IMMA TS Pre-Test

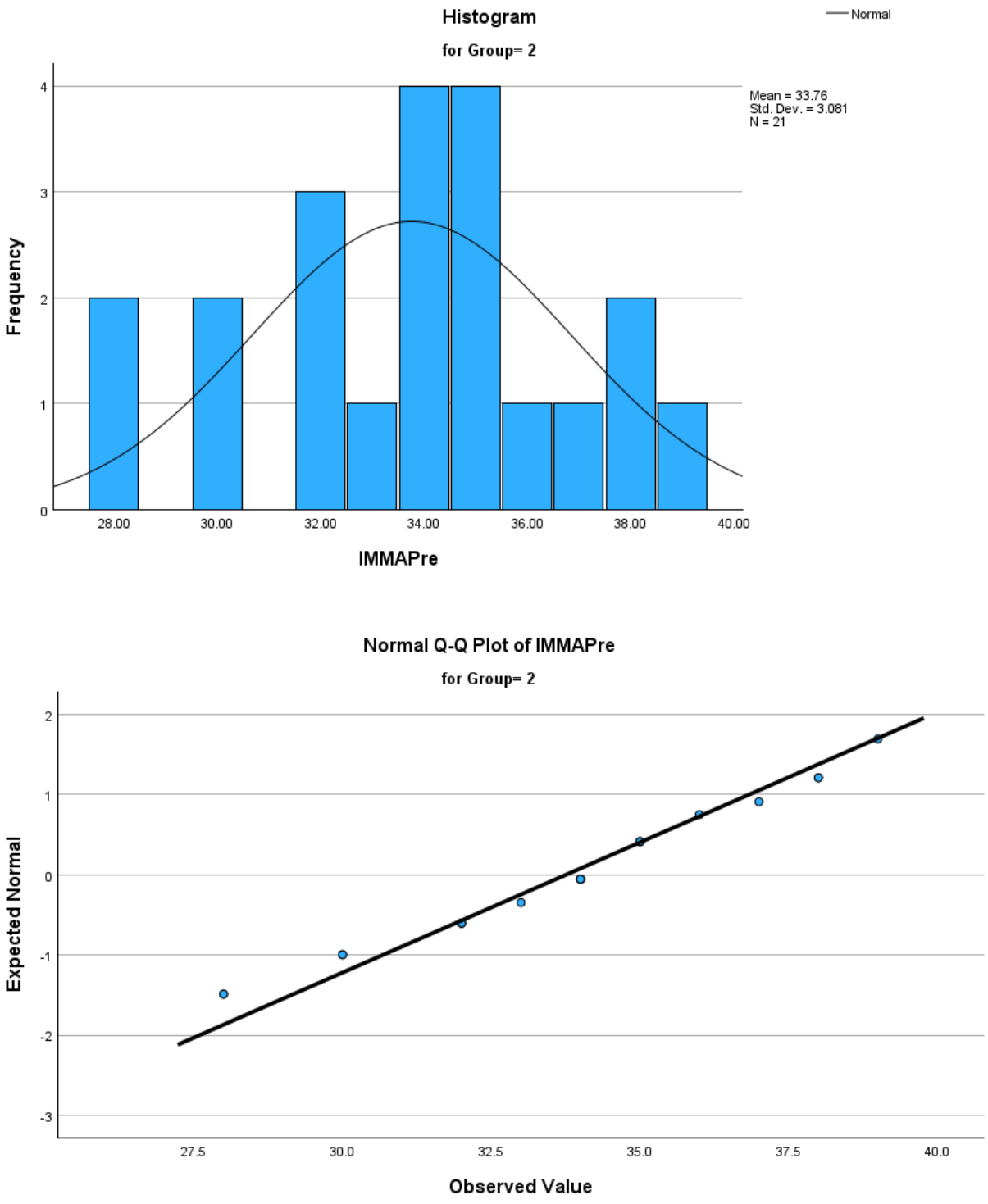

Figure 8. Histogram & Q-Q Plots: Group 2 (Ctrl.) IMMA TS Pre-Test

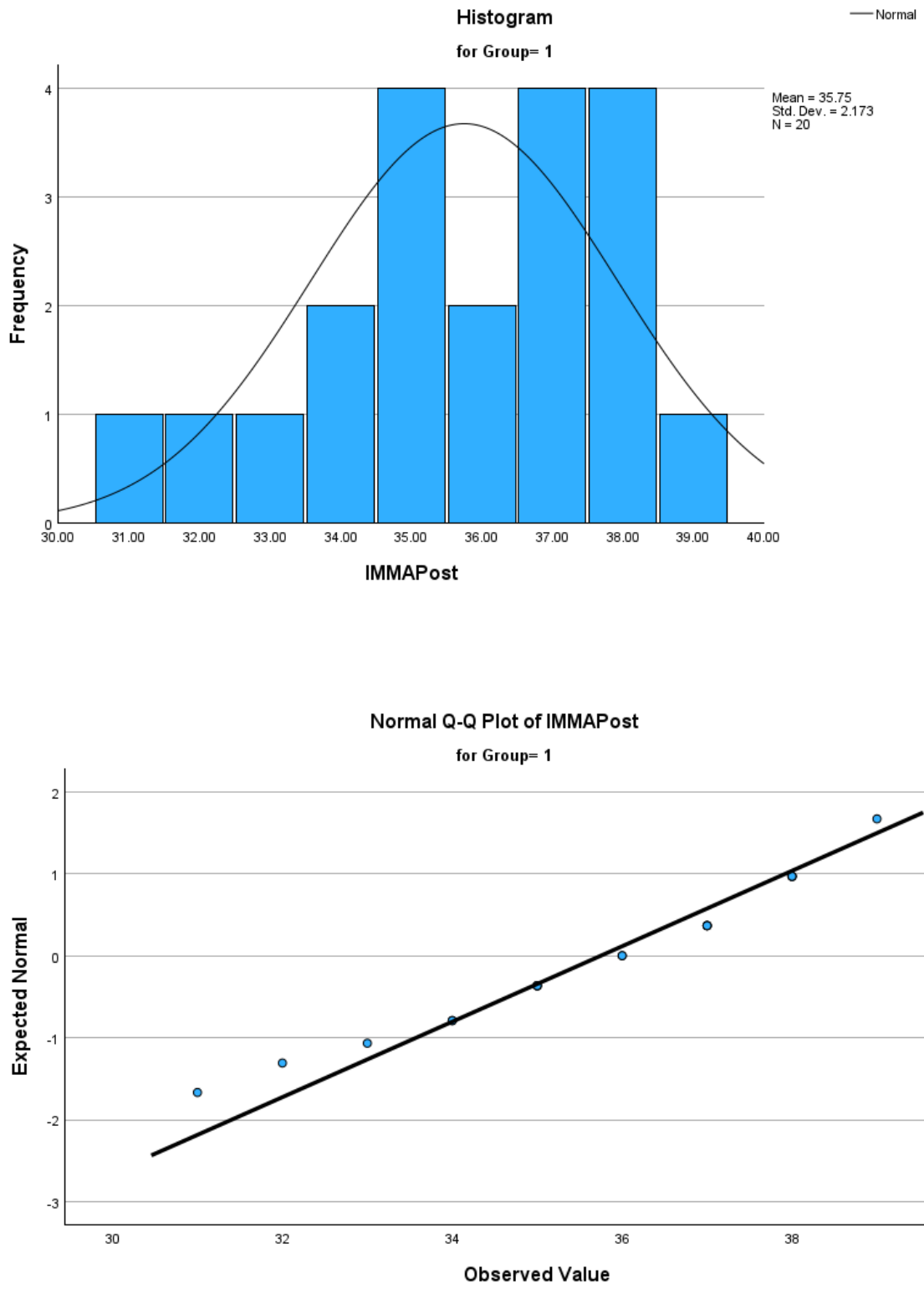

Figure 9. Histogram & Q-Q Plots: Group 1 (Exp.) IMMA TS Post-Test

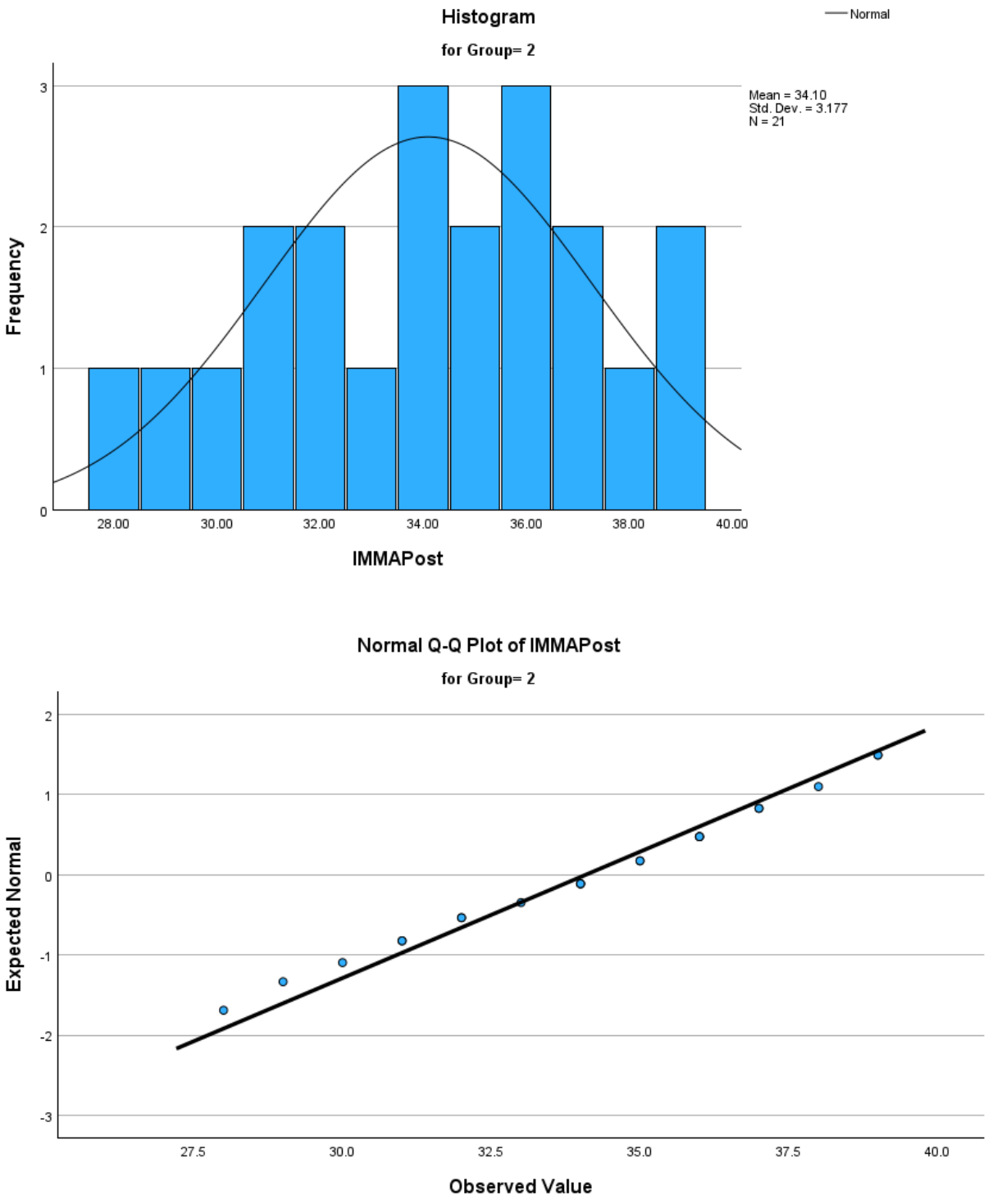

Figure 10. Histogram & Q-Q Plots: Group 2 (Ctrl.) IMMA TS Post-Test

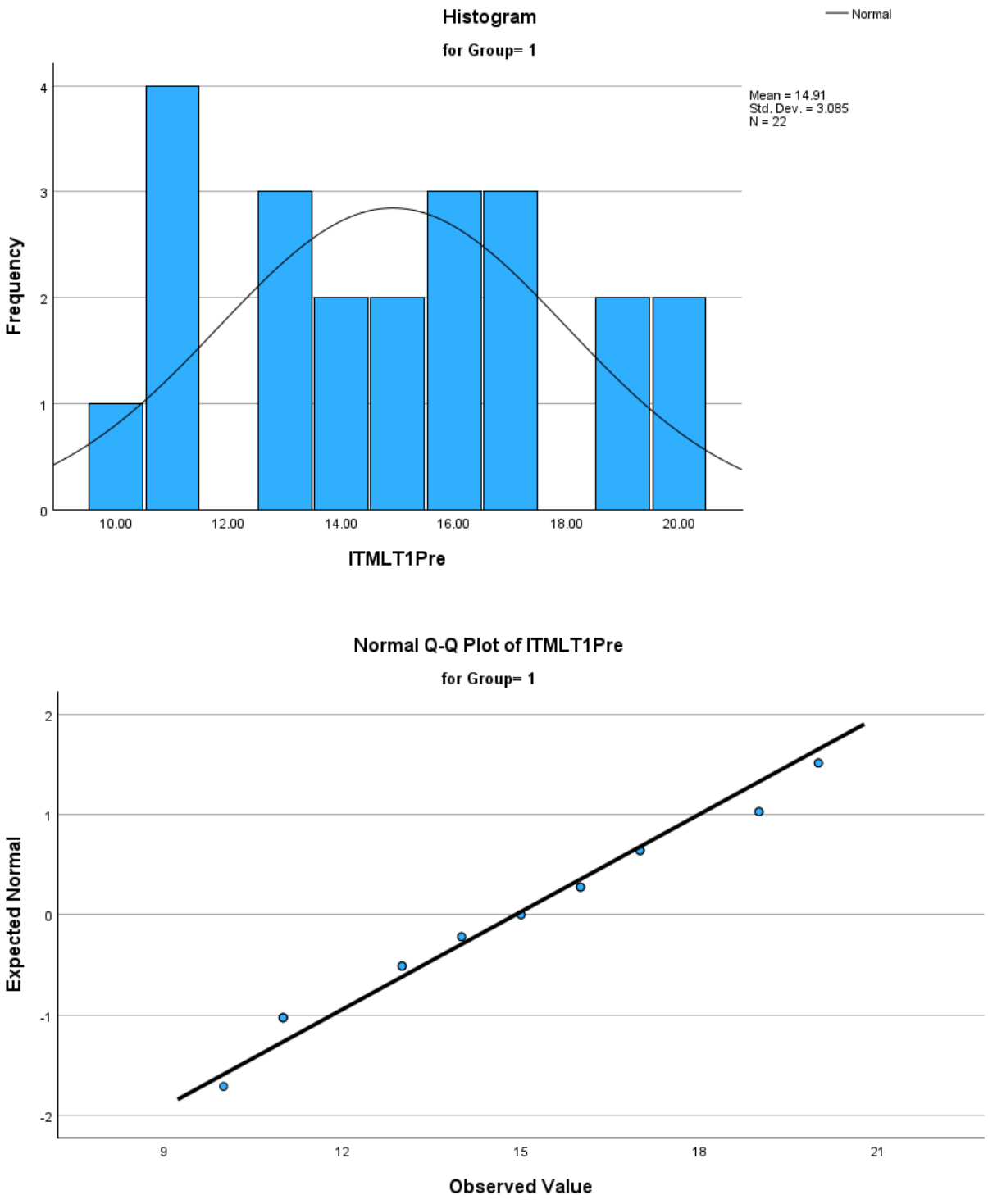

Figure 11. Histogram & Q-Q Plots: Group 1 (Exp.) ITML T1 Pre-Test

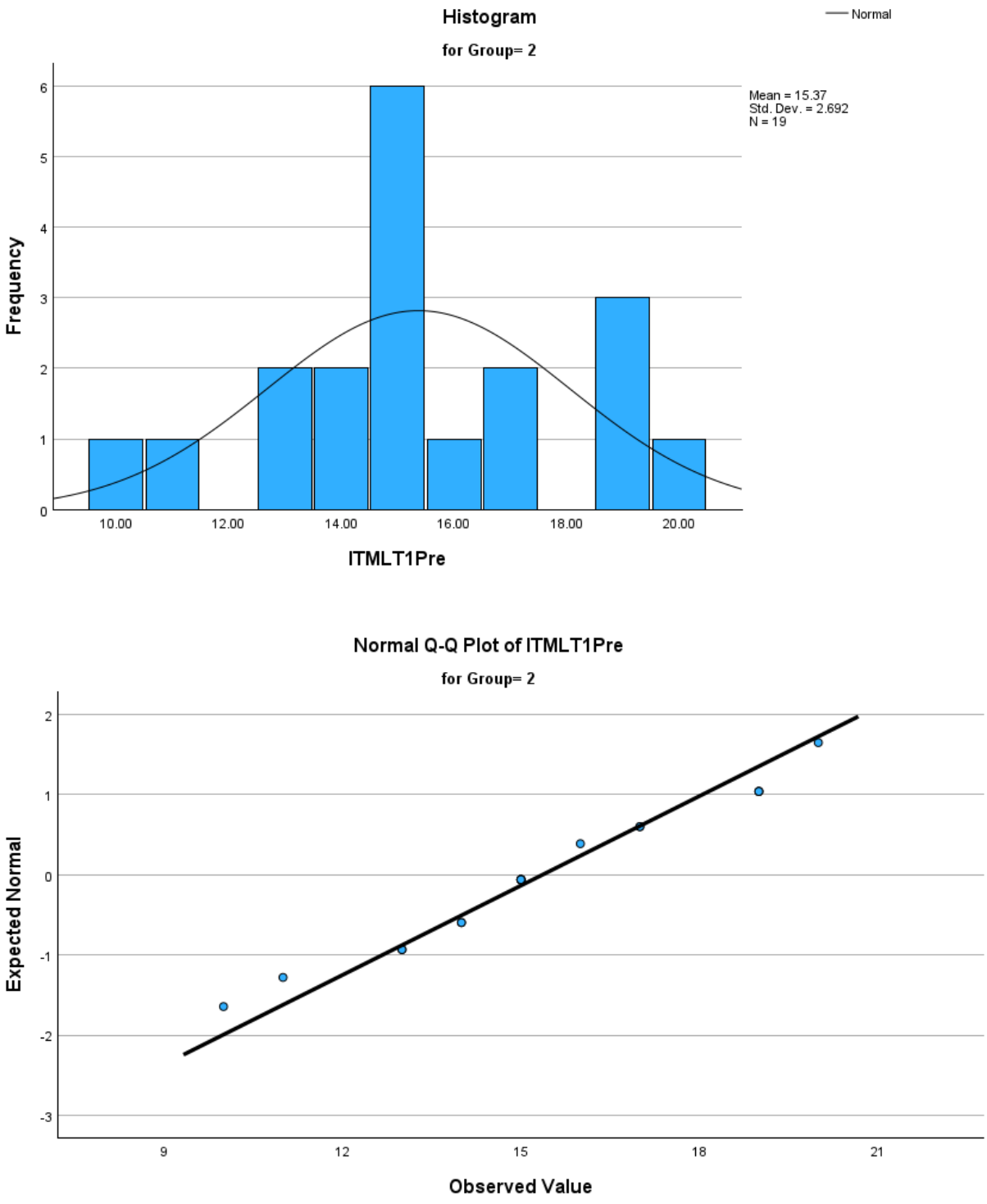

Figure 12. Histogram & Q-Q Plots: Group 2 (Ctrl.) ITML T1 Pre-Test

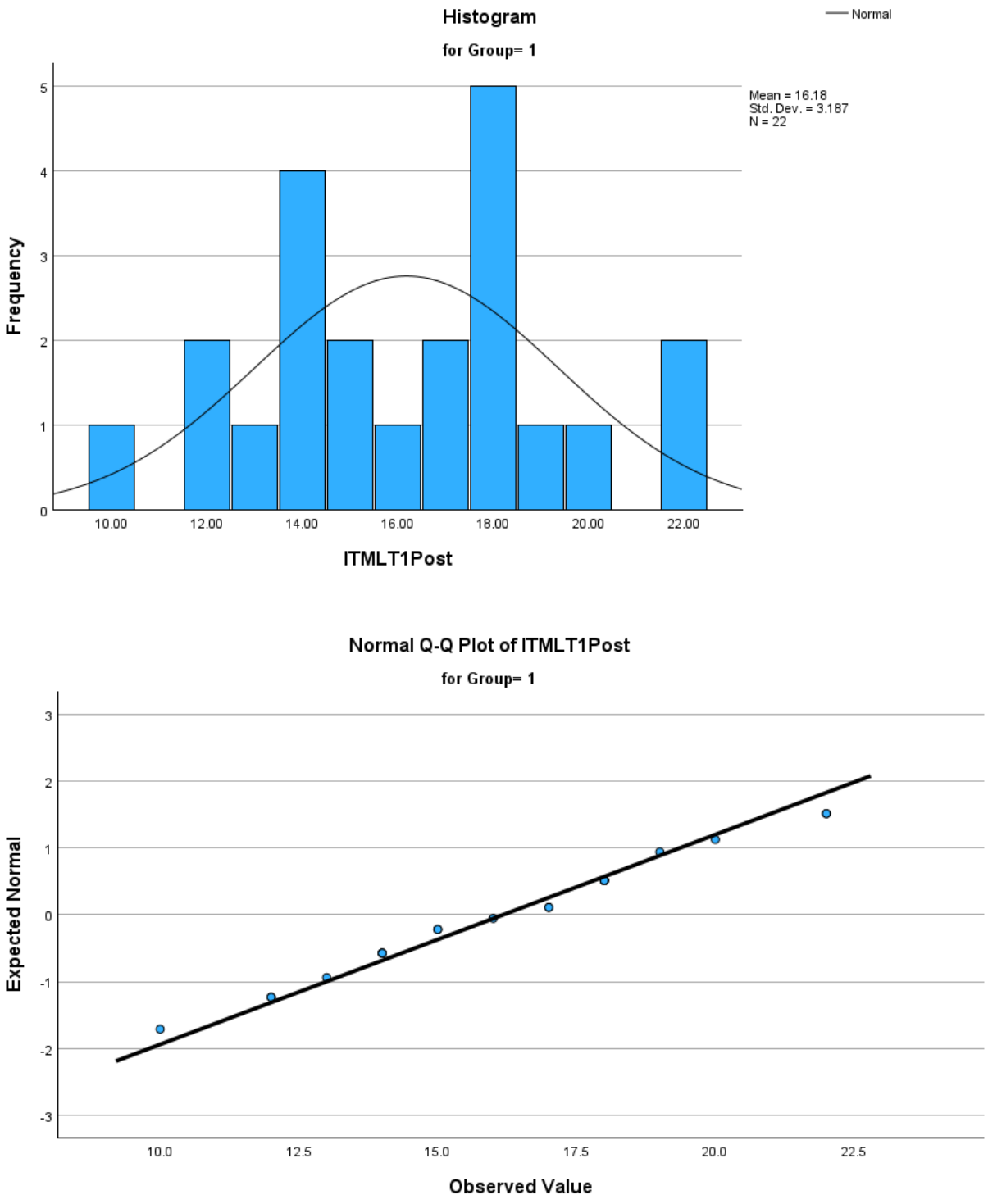

Figure 13. Histogram & Q-Q Plots: Group 1 (Exp.) ITML T1 Post-Test

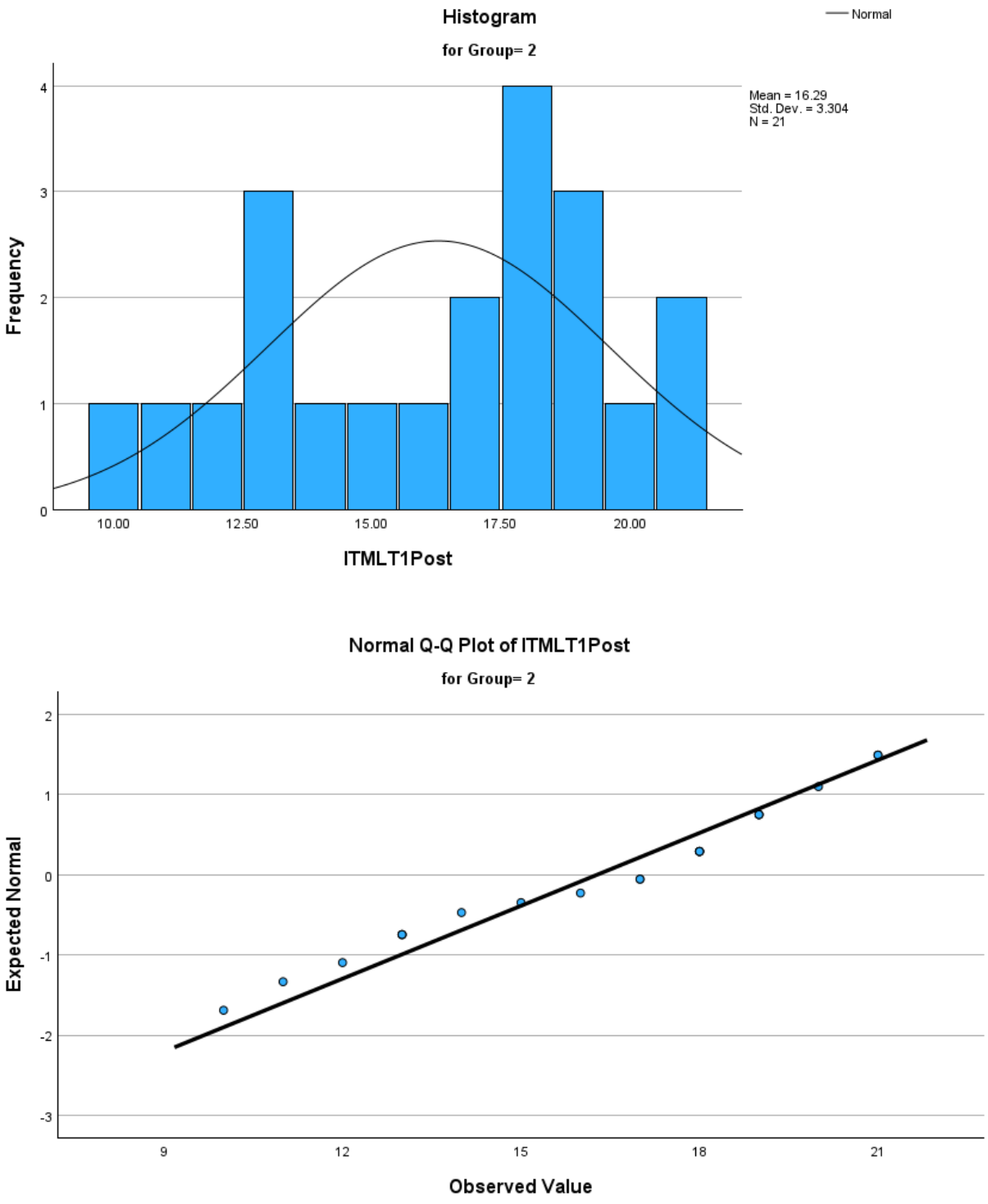

Figure 14. Histogram & Q-Q Plots: Group 2 (Ctrl.) ITML T1 Post-Test

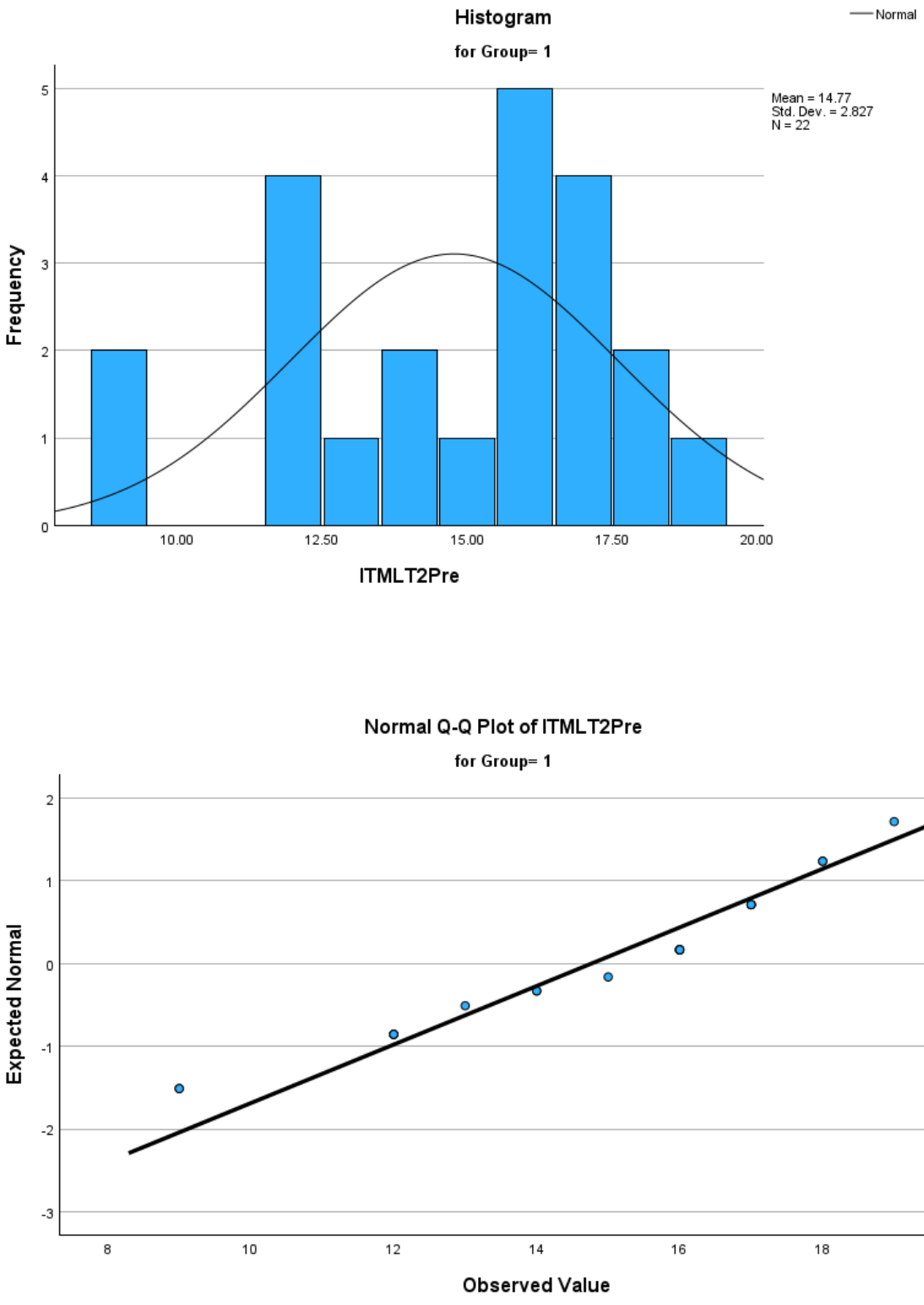

Figure 15. Histogram & Q-Q Plots: Group 1 (Exp.) ITML T2 Pre-Test

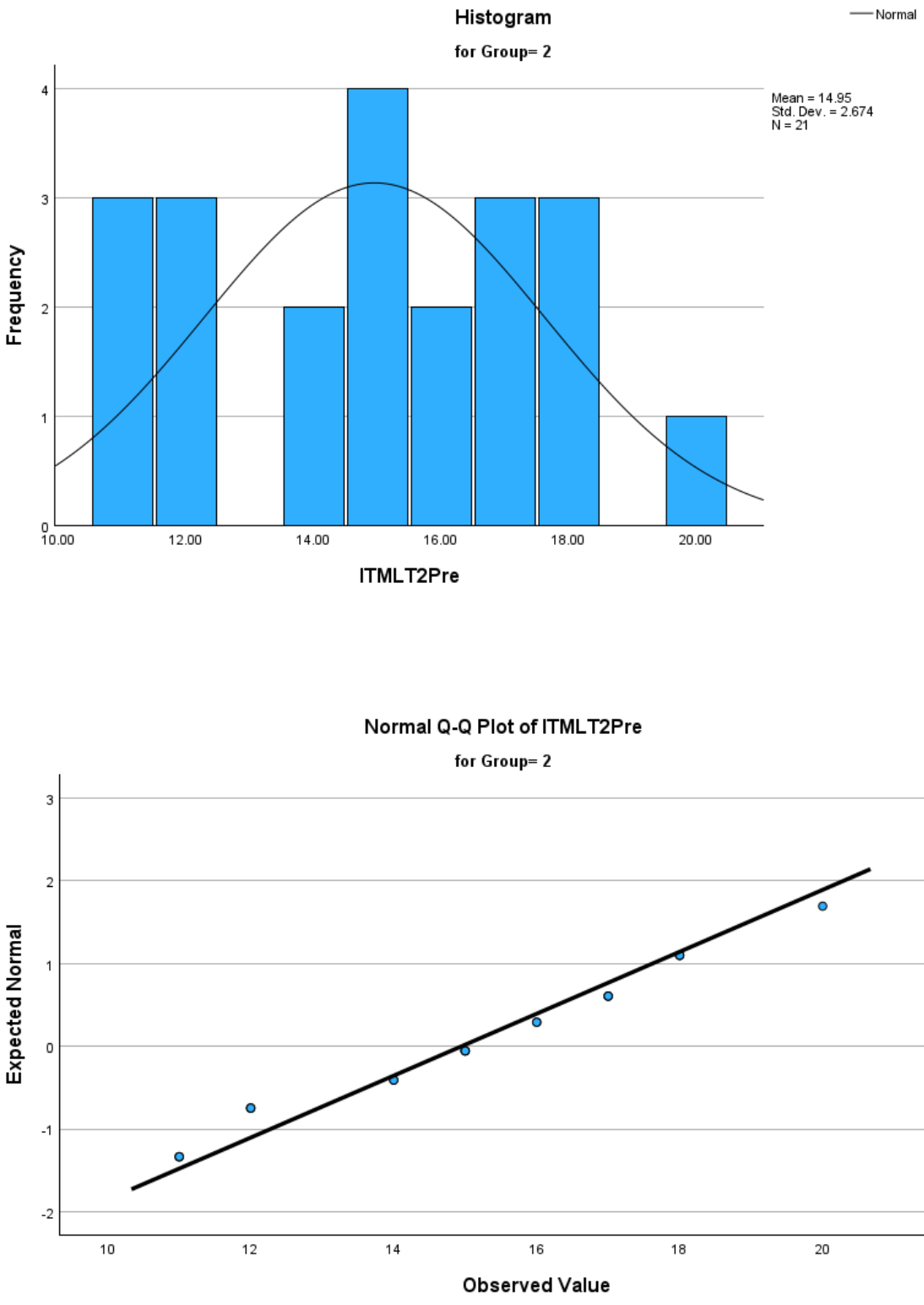

Figure 16. Histogram & Q-Q Plots: Group 2 (Ctrl.) ITML T2 Pre-Test

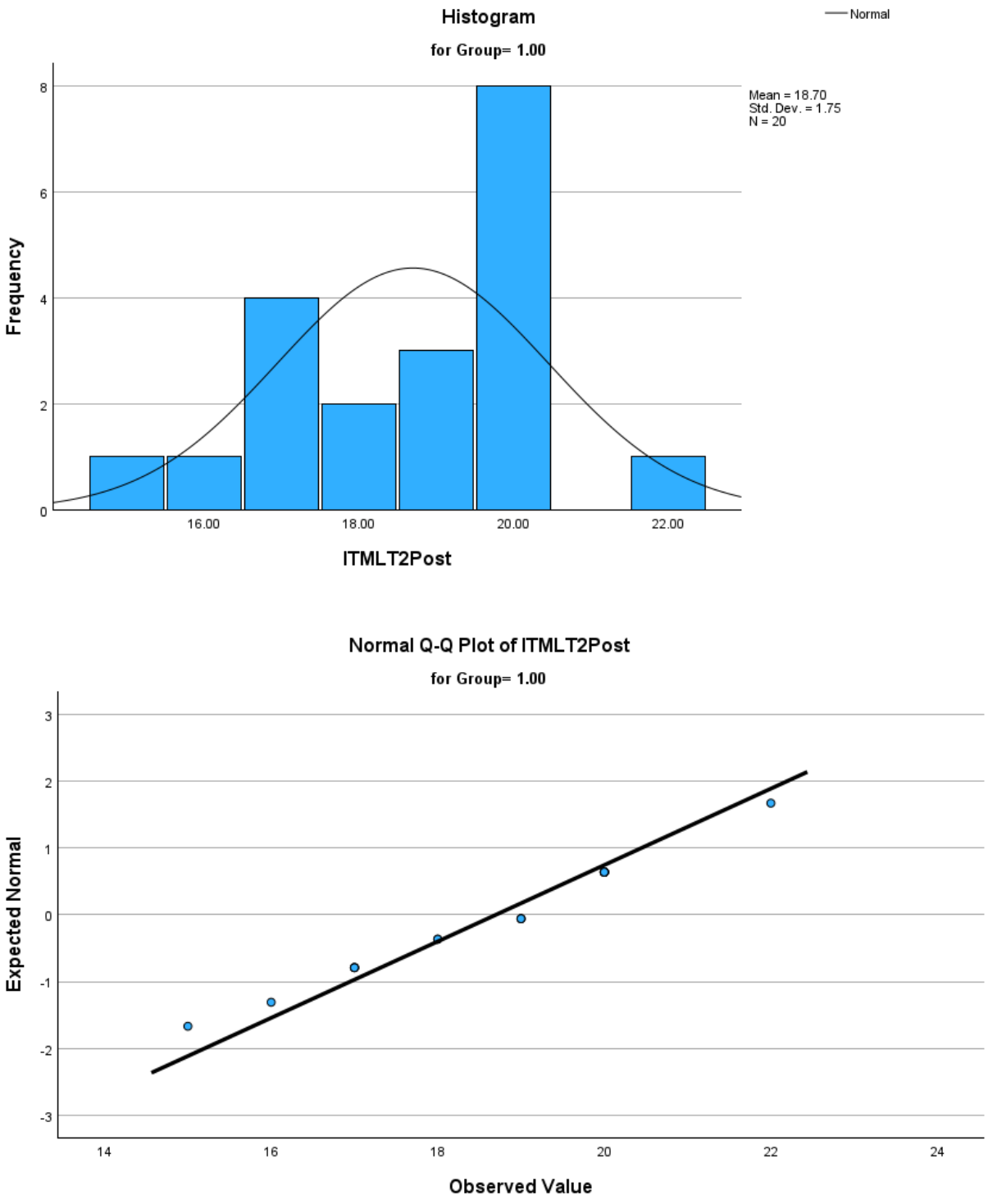

Figure 17. Histogram & Q-Q Plots: Group 1 (Exp.) ITML T2 Post-Test

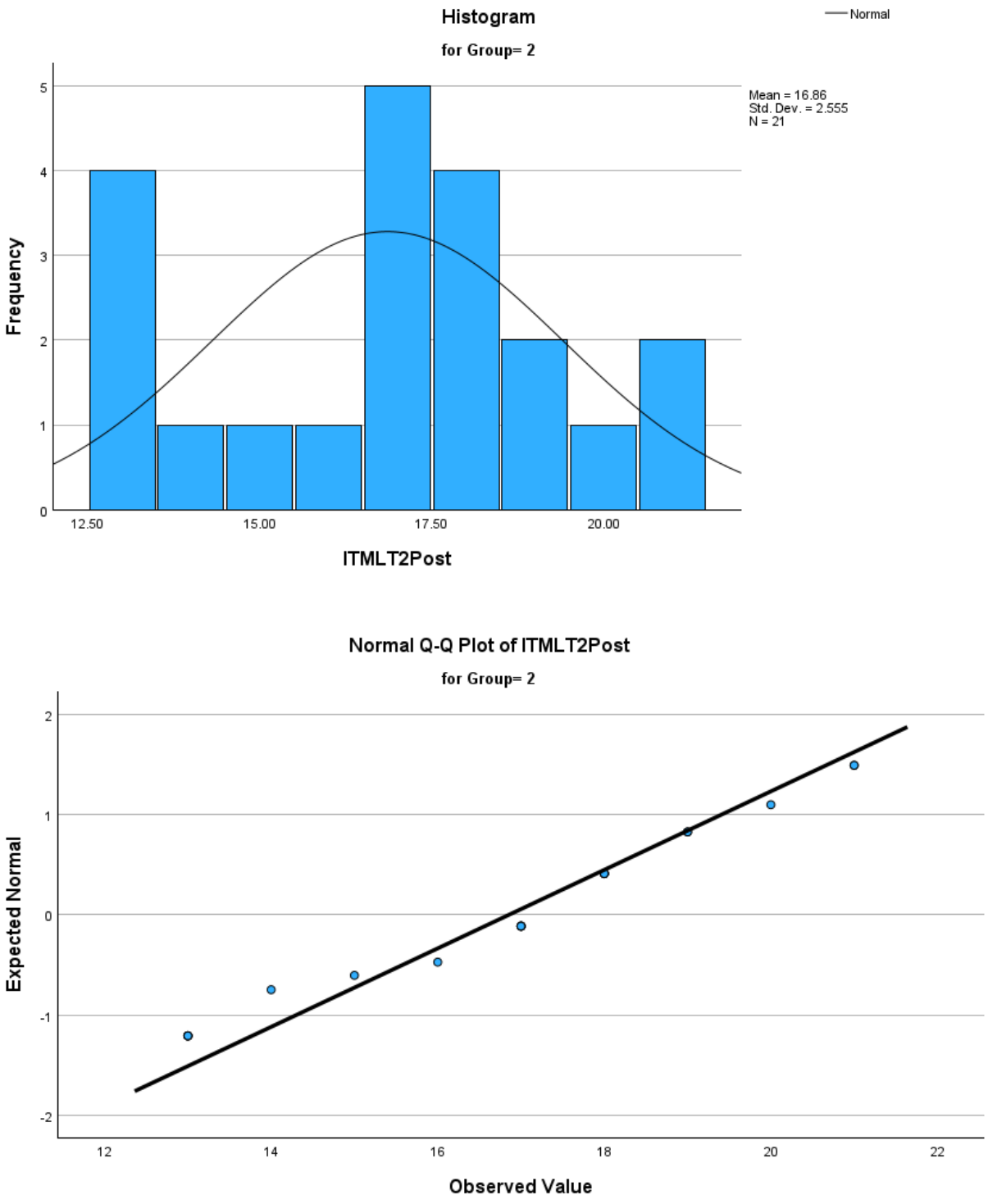

Figure 18. Histogram & Q-Q Plots: Group 2 (Ctrl.) ITML T2 Post-Test

Assumption Five

Assumption five stipulates that the distribution of the dependent variable within each independent variable group should ideally resemble a normal distribution. The Shapiro-Wilk test was chosen for this study because the sample size was less than fifty ($N = 43$). This test is appropriate for assessing normality in smaller data sets. After removing outliers, the researcher used SPSS Statistics software to evaluate assumption five and conduct normality tests, including the Shapiro-Wilk test, to determine whether the samples followed a normal distribution. With a significance level set at $p < .05$, the analysis results indicated that the data adhered to a normal distribution, confirming that the normality assumption was not violated. Table 12 indicates that all tests resulted in *p*-values greater than 0.05, confirming the acceptability of the assumption.

Table 12. Shapiro-Wilk Normality Test (No Outliers)

Assessment	Group	*Statistic*	*df*	*p*
ITML T1 Pre	1	.945	22	.250
ITML T1 Pre	2	.950	19	.397
ITML T1 Post	1	.967	22	.652
ITML T1 Post	2	.938	21	.198
ITML T2 Pre	1	.922	22	.082
ITML T2 Pre	2	.938	21	.203
ITML T2 Post	1	.914	21	.071
ITML T2 Post	2	.922	21	.093
IMMA TS Pre	1	.979	20	.919
IMMA TS Pre	2	.959	21	.490
IMMA TS Post	1	.930	21	.136
IMMA TS Post	2	.968	21	.691

Note. Group 1 = Experimental and Group 2 = Control

Assumption Six

Levene's Test for Equality of Variances

Assumption six of the independent samples *t*-test requires that the variances of the two groups being compared in the population are equal.[6] This condition, known as homogeneity of variance, can be evaluated using Levene's Test for Equality of Variances. Levene's test is automatically generated when conducting an independent samples *t*-test in SPSS Statistics. Homogeneity of variance assumes that the spread of scores across the different groups is relatively similar. Table 13 shows that the significance values for each test exceeded .05, indicating no significant difference in variances and confirming that the assumption of equal variances is reasonable.

Table 13. Levene's Test for Variances Equality

Assessment	*F*	*df*	*Significance*	Met
IMMA TS Pre	.08	39	.783	Y
IMMA TS Post	1.85	40	.182	Y
ITML T1 Pre	.96	39	.333	Y
ITML T1 Post	.13	41	.723	Y
ITML T2 Pre	.20	41	.654	Y
ITML T2 Post	1.88	39	.179	Y

Results

The examination of histograms and Q-Q plots revealed typical distribution characteristics for both pre- and post-test scores of the IMMA TS, ITML T1, and ITML T2 assessments across both experimental and control groups. Furthermore, Levene's Test for Equality of Variances

[6] Laerd Statistics, "Assumptions," SPSS Statistics Tutorials and Statistical Guides | Laerd Statistics, accessed March 17, 2024, https://statistics.laerd.com/premium/spss/istt/independent-t-test-in-spss-7.php.

confirmed homogeneity of variance. Consequently, the researcher proceeded with independent samples *t*-tests, employing a 95% confidence interval to assess the mean difference in each post-test score.

Three independent samples *t*-tests were conducted to compare the post-test means between the experimental and control groups. A Bonferroni correction was applied to mitigate the risk of a Type I error due to multiple comparisons. This correction divided the standard α level of .05 by the number of assessments (three post-tests), yielding an adjusted α value of $p = 0.017$ (.05/3 = .0166, rounded to .017). This adjusted α value was then used to determine the statistical significance of the *t*-test results.

Cohen's *d* Effect Size

During the analysis of both independent samples *t*-tests and paired samples *t*-test results, the researcher considered Cohen's *d* effect size to provide insights into the practical implications of the findings and their potential application in real-world settings. Cohen's *d* effect size calculations were conducted within the SPSS Statistics program alongside the *t*-tests. Cohen organized his criteria for effect size into categories of small (0.2), medium (0.5), and large (0.8).[7] Sullivan and Feinn, citing Glass, emphasized that the primary focus of study results should be on understanding the extent to which the treatment affects the participants rather than solely on statistical significance.[8] Cohen asserted that understanding the real-world implications of research results extends beyond statistical significance, advocating for focusing on effect size

[7] Gail M. Sullivan and Richard Feinn, "Using Effect Size—or Why the *P* Value Is Not Enough," *Journal of Graduate Medical Education* 4, no. 3 (September 2012): 280, https://doi.org/10.4300/jgme-d-12-00156.1.

[8] Ibid., 280.

over *p*-values to highlight the overall interpretation of research findings.[9] According to Laerd Statistics, although an independent *t*-test reveals differences between group means, it does not measure the extent of the difference.[10] Analyzing effect sizes helps address this limitation. A small Cohen's *d* suggests a minor difference between group means, which may not have substantial practical significance. In contrast, a large Cohen's *d* indicates a considerable difference between group means, making it highly probable that the observed effect resulted from the intervention compared to the control condition.

Independent Samples *t*-Test Results

The mean post-test scores of the Intermediate Measures of Music Audiation Tonal Subtest (IMMA TS) were analyzed using an independent samples *t*-test. This test compared the music aptitude scores of beginning band students in two groups: those taught with a sound-before-sight strategy (experimental group) and those taught using a traditional note-by-note method (control group). The analysis aimed to assess differences between the two teaching methods, providing insights into the effectiveness of the treatment.

The analysis revealed no significant difference in scores between the experimental group ($M = 35.75$, $SD = 2.17$) and the control group ($M = 34.10$, $SD = 3.18$) for IMMA TS post-test; $t(39) = 1.937$, $p = .060$. While these results suggest that implementing a sound-before-symbol approach does not significantly impact music aptitude scores on the IMMA TS assessment, the Cohen's *d* effect size provides empirical evidence supporting the treatment's effectiveness in

[9] Jacob Cohen, "Things I Have Learned (So Far)," *American Psychologist* 45, no. 12 (1990): 1310, https://doi.org/10.1037//0003-066x.45.12.1304.

[10] Laerd Statistics, "Calculating and Reporting and Effect Size," SPSS Statistics Tutorials and Statistical Guides | Laerd Statistics, accessed March 17, 2024, https://statistics.laerd.com/premium/spss/istt/independent-t-test-in-spss-19.php.

real-world settings. Refer to Table 14 for total descriptive statistics, Table 15 for total *t*-test statistics, and Table 16 for Cohen's *d* effect size.

Table 14. Descriptive Statistics: IMMA TS Post-Test: Exp. (1) vs. Ctrl. (2)

Assessment	Group	*M*	*SD*	*N*
IMMA TS Post	1	35.75	2.17	20
	2	34.10	3.18	21

Table 15. *t*-Test Statistics: IMMA TS Post-Test

Assessment	*F*	*df*	*Sig. (2-tailed)*	*Mean Difference*	*95% CI*	
					Lower	*Upper*
IMMA TS Post	2.87	39	.060	1.66	-.07	3.38

Table 16. Effect Size: IMMA TS Post-Test

Assessment	Cohen's *d*	Effect Size
IMMA TS Post	.61	Medium

The researcher conducted a second independent-samples *t*-test audiation and listening music achievement scores of beginning band students in two groups: those taught with a sound-before-sight strategy (experimental group) and those taught traditionally (control group). The researcher assessed the mean post-test scores of the Iowa Tests of Music Literacy Tonal Concepts - Level 1 Audiation/Listening (ITML T1) using an independent samples *t*-test to identify differences between the two teaching methods. The results showed no significant difference in scores between the experimental group ($M = 16.18$, $SD = 3.19$) and the control group ($M = 16.29$, $SD = 3.30$) for the ITML T1 post-test; $t(41) = -.105$, $p = .917$. These findings suggest that the sound-before-symbol approach does not significantly affect audiation/listening

scores on the ITML T1 test. Refer to Table 17 for total descriptive statistics, Table 18 for total *t*-test statistics, and Table 19 for Cohen's *d* effect size.

Table 17. Descriptive Statistics: ITML T1 Post-Test: Exp. (1) vs. Ctrl. (2)

Assessment	Group	*M*	*SD*	*N*
ITML T1 Post	1	16.18	3.19	22
	2	16.29	3.30	21

Table 18. *t*-Test Statistics: ITML T1 Post-Test

Assessment	*F*	*df*	*Sig. (2-tailed)*	*Mean Difference*	*95% CI*	
					Lower	*Upper*
ITML T1 Post	.13	41	.917	.10	-2.10	1.90

Table 19. Effect Size: ITML T1 Post-Test

Assessment	Cohen's *d*	Effect Size
ITML T1 Post	-.032	Small

The researcher conducted a third independent-samples *t*-test to compare the audiation and reading music achievement scores of beginning band students in two groups: those taught with a sound-before-sight strategy (experimental group) and those taught traditionally (control group). The mean post-test scores of the Iowa Tests of Music Literacy Tonal Concepts - Level 2 Audiation/Reading (ITML T2) were examined using an independent samples *t*-test to assess differences between the teaching methods. The analysis revealed a significant difference in scores between the experimental group (M = 18.70, SD = 1.75) and the control group (M = 16.86, SD = 2.56) for the ITML T2 post-test; $t(39) = 2.681$, $p = .011$. This *p*-value result, coupled with a very large Cohen's *d* effect size, demonstrates that employing a sound-before-symbol approach significantly influences audiation/reading scores on the ITML T2 test. Refer to Table

20 for total descriptive statistics, Table 21 for total *t*-test statistics, and Table 22 for Cohen's *d* effect size.

Table 20. Descriptive Statistics: ITML T2 Post-Test: Exp. (1) vs. Ctrl. (2)

Assessment	Group	*M*	*SD*	*N*
ITML T2 Post	1	18.70	1.75	20
	2	16.86	2.56	21

Table 21. *t*-Test Statistics: ITML T2 Post-Test

Assessment	*F*	*df*	*Sig. (2-tailed)*	*Mean Difference*	*95% CI*	
					Lower	*Upper*
ITML T2 Post	1.88	39	.011	1.84	.45	3.23

Table 22. Effect Size: ITML T2 Post-Test

Assessment	Cohen's *d*	Effect Size
ITML T2 Post	.84	Very Large

After completing initial assumption tests and independent samples *t*-tests, the researcher performed paired *t*-tests to analyze differences within and between groups. The goal was to assess the impact of different instructional treatments on mean scores. Using a Bonferroni correction ($\alpha = 0.017$), the paired *t*-tests compared measurements from the same beginning band students before and after the nine-week study to determine if the average difference between paired observations differed significantly from zero.

Paired Samples *t*-Test Results

Paired Samples *t*-Test IMMA TS Group Comparisons

The paired samples *t*-test for the IMMA TS assessment reveals that the experimental group's perceived music audiation scores increased from pre-study (M = 34.11, SD = 2.59) to post-study (M = 35.78, SD = 2.13; t = 2.98, p = .008, d = .70). Similarly, the control group's IMMA TS scores increased from pre-study (M = 33.76, SD = 3.08) to post-study (M = 34.1, SD = 3.18; t = .584, p =.566, d = .13). While the mean difference for both groups showed improvement, the experimental group had a mean difference that was, on average, 1.34 points higher than the control group. This contrast highlights the potential effectiveness of the treatment in the experimental group, indicating its role in enhancing outcomes compared to the control group. Refer to Table 23 for total descriptive statistics, Table 24 for total *t*-test statistics, and Table 25 for Cohen's *d* effect size.

Table 23. Descriptive Statistics: IMMA TS Paired Samples *t*-Test Exp. & Ctrl. Groups

Group	Assessment	*M*	*SD*	*N*
Experimental	Pre	34.11	2.59	18
Experimental	Post	35.78	2.13	18
Control	Pre	34.05	2.86	21
Control	Post	34.10	3.18	21

Table 24. Statistics: IMMA TS Paired *t*-Test: Exp. & Ctrl. Groups

Group	*t*	*df*	*Sig. (2-tailed)*	*Mean Difference*	*95% CI*	
					Lower	*Upper*
Experimental	2.98	17	.008	1.67	.485	2.85
Control	.58	20	.566	.33	-.857	1.52

Table 25. Effect Size: IMMA TS Paired Samples

Group	Cohen's *d*	Effect Size
Experimental	.70	Medium
Control	.13	Small

Paired Samples *t*-Test ITML T1 Group Comparisons

The ITML T1 paired samples *t*-test reveals that the experimental group's perceived audiation and listening music achievement scores increased from pre-study (M = 14.91, SD =3.08) to post-study (M = 16.18, SD = 3.19; t = 1.91, p = .035, d = .41). Similarly, the control group's ITML T1 scores increased from pre-study (M = 15.37, SD = 2.69) to post-study (M = 16.05, SD = 3.36; t = .735, p = .236, d = .17). While the mean difference for both groups showed improvement, the experimental group had a mean difference that was, on average, 0.59 points higher than the control group. This contrast highlights the potential effectiveness of the treatment in the experimental group, indicating its role in enhancing outcomes compared to the control group. Refer to Table 26 for total descriptive statistics, Table 27 for total *t*-test statistics, and Table 28 for Cohen's *d* effect size.

Table 26. Descriptive Statistics: ITML T1 Paired Samples *t*-Test Exp. & Ctrl. Groups

Group	ITML T1	*M*	*SD*	*N*
Experimental	Pre	14.91	3.09	22
Experimental	Post	16.18	3.19	22
Control	Pre	15.37	2.69	19
Control	Post	16.05	3.36	19

Table 27. Statistics: ITML T1 Paired *t*-Test: Exp. & Ctrl. Groups

Group	*t*	*df*	*Sig. (2-tailed)*	*Mean Difference*	*95% CI*	
					Lower	*Upper*
Experimental	1.91	21	.07	1.27	-.11	2.66
Control	1.07	18	.30	.68	-1.27	2.64

Table 28. Effect Size: ITML T1 Paired Samples

Group	Cohen's *d*	Effect Size
Experimental	.41	Medium
Control	.17	Small

Paired Samples *t*-Test ITML T2 Group Comparisons

The ITML T2 paired samples *t*-test showed that the experimental group's perceived audiation and reading music achievement scores increased from pre-study (M = 15.2, SD = 2.55) to post-study (M = 18.7, SD = 1.75; t = 8.34, p < .001, d = 1.9). Similarly, the control group's ITML T2 scores increased from pre-study (M = 14.95, SD = 2.67) to post-study (M = 16.86, SD = 2.56; t = 4.07, p <.001, d = .89). While the mean difference for both groups showed improvement, the experimental group had a mean difference that was, on average, 1.59 points higher than the control group. This large discrepancy highlights the potential effectiveness of the treatment in the experimental group, indicating its role in enhancing outcomes compared to the control group. Refer to Table 29 for total descriptive statistics, Table 30 for total *t*-test statistics, and Table 31 for Cohen's *d* effect size.

Table 29. Descriptive Statistics: ITML T2 Paired Samples *t*-Test Exp. & Ctrl. Groups

Group	Assessment	*M*	*SD*	*N*
Experimental	Pre	15.20	2.55	20
Experimental	Post	18.70	1.75	20
Control	Pre	14.95	2.67	21
Control	Post	16.86	2.56	21

Table 30. Statistics: ITML T2 Paired *t*-Test: Exp. & Ctrl. Groups

Group	*t*	*df*	*Sig. (2-tailed)*	*Mean Difference*	*95% CI*	
					Lower	*Upper*
Experimental	8.34	19	<.001	3.50	2.62	4.38
Control	4.07	20	<.001	1.91	.93	2.88

Table 31. Effect Size: ITML T2 Paired Samples

Group	Cohen's *d*	Effect Size
Experimental	1.8	Very Large[11]
Control	.90	Large

Hypotheses

The independent samples *t*-test mean comparisons did not show a statistically significant difference between the IMMA TS scores of the experimental and control group post-tests. Therefore, the results supported not rejecting $H_0$1 at a 95% confidence level, concluding that there is no statistically significant difference in the IMMA TS music aptitude post-test scores between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices).

Similarly, the independent samples *t*-test mean comparisons did not show a statistically significant difference between the Iowa Tests of Music Literacy (ITML) Tonal Aural (T1) assessment scores of the experimental and control group post-tests. Thus, these results supported not rejecting $H_0$2 at a 95% confidence level, concluding that there is no difference in the Level 1—Audiation/Listening—Tonal Aural (T1) Perception post-subtest scores of the ITML between

[11] Sullivan and Feinn, "Using Effect Size," 280.

the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices).

Notably, the independent samples *t*-test mean comparisons demonstrated a statistically significant difference between the ITML T2 assessment scores of the experimental and control group post-tests. Therefore, it was necessary to reject the null hypothesis $H_0$3 at a 95% confidence level, concluding that there is a statistically significant difference in Level 1—Audiation/Reading—Tonal Reading (T2) Perception post-subtest scores of the ITML between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices).

Chapter Five: Conclusion/Discussion

This chapter begins with an overview of the study's purpose, design, and essential results. The study's primary aim was to investigate the effects of a sound-before-sight approach employing vocalization techniques in a beginning band setting compared to a traditional note-reading method. The study utilized a quantitative, experimental approach with a two-group post-test design. It employed independent samples *t*-tests and paired *t*-tests to compare the mean difference and mean gain scores of music aptitude and tonal music achievement test scores. The analysis and results informed the conclusions regarding the research questions, null hypotheses, and whether they were rejected or retained. The researcher then identified delimitations and limitations, analyzing their potential impact on the outcomes of this study. The chapter concludes by providing recommendations for music educators and suggesting directions for future research.

Summary of Study

This study investigated the effects of vocalization techniques and a sound-before-sight strategy on beginning band students compared to a traditional note-reading method. Over nine weeks, the researcher provided instruction to two randomly assigned groups of beginning band students. The control group received traditional note-reading instruction, while the experimental group received a sound-before-sight strategy emphasizing vocalization and audiation techniques. Both groups engaged in weekly twenty-minute instructional sessions, where they learned melodies selected from the *Standard of Excellence: Comprehensive Band Method: Book One*.

This study was inspired by the seminal work of Johann Pestalozzi, Lowell Mason, and Edwin E. Gordon, who championed prioritizing auditory skills before symbolic notation. It explored various strategies and benefits of incorporating audiation skill development within a

beginning band setting. The main goal of this study was to investigate the impact of integrating vocalization techniques, such as listening, singing, chanting, and “singering,” into beginning band instruction. Specifically, the study aimed to assess how this integration would affect the mean post-test scores of music aptitude and achievement tests compared to students instructed through traditional note-by-note methods.

The sound-before-sight philosophy follows an ordered structure, emphasizing the mastery of fundamental concepts before introducing more complex ones. Educational theorists like Bruner, Gagné, and Gordon stressed the significance of sequential instruction and understanding children’s optimal learning styles. Their educational philosophies centered on hierarchical learning and cultivating readiness. Gordon’s music learning theory (MLT) exemplifies how music should be taught sequentially, advocating mastering auditory skills before introducing symbolic music notation. In this study, the researcher explored this sound-before-sight approach to evaluate its potential benefits for beginning band students, enabling them to understand and play the music they hear before transitioning to reading notation.

Summary of Findings and Prior Research

Purpose of the Study

The purpose of this quantitative experimental study was to examine the impact of two different instructional strategies on beginning band instruction. The researcher’s introduction to Gordon’s music learning theory (MLT) during her master’s degree studies reshaped her approach to beginning band instruction and inspired this study. This investigation aimed to determine how implementing traditional and experimental instructional techniques could impact post-test scores on music achievement and aptitude tests. One approach adhered to a traditional method

emphasizing technical proficiency and note-reading skills, while the other prioritized aural skill development through listening, chanting, singing, solfège signing, and "singering" techniques. Post-test scores from the IMMA Tonal Subtest (TS), the ITML for Audiation/Listening (T1), and the ITML for Audiation/Reading (T2) were analyzed to assess the effectiveness of each instructional approach in enhancing students' musical aptitude and achievement. The specific research questions that guided the study are as follows:

RQ1: Is there a difference in Intermediate Measures of Music Audiation – Tonal Subtest (IMMA TS) music aptitude post-subtest scores between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

RQ2: Is there a difference in Level 1—Audiation/Listening—Tonal Aural (T1) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

RQ3: Is there a difference in Level 1—Audiation/Reading—Tonal Reading (T2) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

Design of the Study

The research approach for this study was a post-test experimental design involving both control and experimental groups. This design was appropriate for assessing the effectiveness of different teaching methods in a beginning band program, particularly examining the role of vocalization and audiation in enhancing music achievement. The researcher administered pre-

tests and post-tests to collect data, which were then analyzed using independent samples *t*-tests and paired samples *t*-tests to evaluate music aptitude and tonal music achievement gain scores. The sample consisted of participants recruited from a small rural elementary school in southeast Minnesota. All students in grades four and five had an equal opportunity to participate in the study through enrollment in the beginning band program.

Forty-three students and their parents signed consent and assent forms to participate in the study. All students successfully attended and completed the nine-week program. The researcher randomly assigned the students to either the control or experimental group, informing them that their participation was essential for understanding how different teaching styles impact learning to play an instrument. They knew each group would receive different instructional methods, but the researcher emphasized that both methods were effective. Each student attended a twenty-minute homogeneous group lesson weekly. The control group followed traditional instruction using the beginning band method book *Standard of Excellence: Comprehensive Band Method: Book One*. The experimental group's instruction focused on singing and audiation without initially using written music.

Before the study commenced, all fourth and fifth-grade students received an invitation to participate in an instrument demonstration session to inspire their interest in joining the band and selecting an instrument. Following the session, each student received a recruitment letter to take home, guiding them to choose their top two preferred instruments for a trial from the following options: flute, clarinet, trumpet, or trombone. Forty-three students expressed interest in joining the band. The researcher divided tryouts into two sessions, allowing students to explore different instruments. After students made their selections, the researcher instructed parents to contact

local music stores to learn about rental programs or to purchase an instrument. The school provided instruments for students facing financial constraints.

While awaiting the arrival of their instruments and before the study officially began, all participants completed three standardized music aptitude and achievement pre-tests: the Intermediate Measures of Music Audiation Tonal Subtest (IMMA TS), the Iowa Tests of Music Literacy Listening/Audiation Tonal Concepts 1 (ITML T1), and the Iowa Tests of Music Literacy Reading/Audiation Tonal Concepts 2 (ITML T2). Upon the arrival of the students' instruments from the music rental store, the researcher organized two thirty-minute sessions for the students. Each session, categorized by instrumentation, aimed to teach students how to hold their instruments properly, form an embouchure, and produce their initial sounds.

The nine-week study began the week after the researcher randomly divided the students into control and experimental groups. The control group received traditional note-reading instruction, starting from page one of the *Standard of Excellence: Comprehensive Band Method: Book One*. Lessons followed the sequence of the method book, relying solely on visual instruction without vocalization. The researcher demonstrated how to play the music notes and create a sound by modeling and showing the corresponding fingerings. This instructional approach was maintained throughout the study.

The experimental group focused on aural/oral instruction and teacher modeling. Students engaged in chanting rhythms, singing melodies on solfège, and "singering," which involves fingering the notes while singing them simultaneously. Additionally, students learned to sign with solfège and sing the lyrics to the songs they played. During the fifth session, students began demonstrating an understanding of aural/oral instruction, and notation provided visual reinforcement of the music. The instruction continued to emphasize sound-before-sight

vocalization methods and modeling with a consistent priority on aural/oral instruction over visual methods. The five steps of this process are as follows:

1. Students echoed the teacher as she chanted the song's rhythm using the word "bum" while patting their laps to the macro beat.
2. While maintaining the macro beat, students echoed as the teacher sang the melody using the neutral syllable "bum" (aural/oral mode). The teacher established key, tonality, meter, and tempo through a "Tune-Up" procedure, which included finding the resting tone on the keyboard or instrument followed by singing a descending "sol-mi-do" arpeggio on the neutral syllable "bum" (see Figure 1).
3. The teacher sang the song's melody using solfège syllables and hand signs, employing a whole-parts-whole method. Students echo-sang and solfège-signed phrase-by-phrase until they were able to sing the entire song.
4. Students learned to finger and sing the notes of the song as the instructor demonstrated the fingering for each note and sang the pitches using solfège syllables. This process, combining fingering and singing, is called "singering."
5. The teacher modeled playing the melody on the instrument, guiding students through a transition from ear-to-hand coordination as they imitated the teacher. This instructional approach advanced phrase-by-phrase until students mastered the entire song.[1]

After the nine-week study, all participants underwent three post-tests: IMMA TS, ITML T1, and ITML T2. The researcher scored the pre-tests and post-tests at the end of the study. The collected data were analyzed using IBM® SPSS Statistics version 29 software. After confirming

[1] Musco, "Playing by Ear," 49.

assumptions regarding normality and homogeneity of variances and removing outliers, the researcher conducted three independent samples *t*-tests on the post-test data to compare the mean group scores. To avoid Type 1 errors, the researcher applied a Bonferroni correction by adjusting the significance level. This adjustment involved dividing 0.05 by the number of comparisons made (three), resulting in a significance level of 0.017. Additionally, paired *t*-tests were performed for each administered test using pre- and post-test results to compare the mean change scores and determine any statistically significant differences.

Results of the Study

The researcher analyzed the data presented in Chapter Four in relation to the specific research questions. The results indicated a statistical significance in the ITML T2 scores but no statistically significant differences in the ITML T1 and IMMA TS scores. The significant score for the ITML T2 suggests that the treatment received by the experimental group improved aural skills in tonal reading and audiation. Although the ITML T1 music literacy and the IMMA TS music aptitude *p*-values were not statistically significant, the mean change scores indicate that the vocalization techniques outperformed traditional instruction methods. The experimental group improved music achievement scores more than the control group.

These outcomes highlight the potential advantages of integrating vocalization and audiation techniques into music education. The mean change score data findings suggest beneficial implications for beginning band instruction and warrant further exploration in future research. Table 32 displays the mean change scores between the experimental and control groups, revealing higher scores for the experimental group across all three paired *t*-test results.

Table 32. Pre/Post Mean Change Scores: Exp. vs. Ctrl. Groups Comparison

	Experimental			Control		
Variable	N	*M*	*SD*	*N*	*M*	*SD*
ITML T1 Pre	22	14.91	3.09	19	15.37	2.69
ITML T1 Post	22	16.18	3.19	19	16.05	3.02
Change Scores		1.27			0.68	
ITML T2 Pre	20	15.20	2.83	21	14.95	2.67
ITML T2 Post	20	18.70	1.75	21	16.86	2.56
Change Scores		3.5			1.91	
IMMA TS Pre	18	34.11	2.80	21	33.76	2.86
IMMA TS Post	18	35.78	2.35	21	34.10	3.03
Change Scores		1.67			0.34	

The researcher considered it essential to observe Cohen's *d* effect size from the paired *t*-tests to understand the significance of the observed differences. Effect sizes are commonly classified into three categories: small (0.2), medium (0.5), and large (0.8). Sullivan and Feinn added an additional category in their research, labeling an effect size 1.3 as "very large."[2] Their article emphasized the importance of reporting both effect size and statistical significance. While statistical significance evaluates whether the findings are due to chance, effect size provides insight into understanding how much the students' scores improved or changed as a result of the instructional strategy. Reporting both metrics are essential for researchers to convey the full impact of the study to readers.[3]

In this study, the effect sizes were consistently more significant for the experimental group than the control group across all comparisons. This statistical measure provides valuable

[2] Sullivan and Feinn, "Using Effect Size," 280.

[3] Ibid., 281.

insights into the practical implications of the findings and their potential application in real-world settings. Table 33 displays Cohen's *d* effect size comparisons for each test and each group.

Table 33. Paired Samples Effect Size: ITML T1, ITML T2, & IMMA TS

Group	Test	Cohen's *d*	Effect Size
Experimental	ITML T1	.41	Medium
Control	ITML T1	.25	Small
Experimental	ITML T2	1.8	Very Large
Control	ITML T2	.90	Large
Experimental	IMMA TS	.80	Large
Control	IMMA TS	.11	Small

Research Questions, Results, and Interpretations

RQ1: Is there a difference in Intermediate Measures of Music Audiation – Tonal Subtest (IMMA TS) music aptitude post-subtest scores between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

The researcher administered the IMMA TS to answer RQ1 and used its results to assess each student's music aptitude. For the IMMA TS, scoring involved counting the number of incorrect responses and subtracting that from the total possible score of 40. The researcher entered each participant's total raw score (RS) into SPSS Statistics and performed an independent samples *t*-test. This *t*-test compared the mean scores of the experimental and control groups to determine whether there was statistical evidence that the means from these two groups were significantly different.

Given the design and limitations of the present study, the answer to RQ1 is that there is no statistically significant difference between the music aptitude scores of beginning band

students instructed with a sound-before-sight vocalization technique and those taught with a traditional note-reading strategy following the nine-week study.

RQ2: Is there a difference in Level 1—Audiation/Listening—Tonal Aural (T1) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

The researcher administered the Iowa Test of Music Literacy Tonal Concepts Level One Audiation/Listening (ITML T1) to answer RQ2. The ITML T1 results measured students' music achievement in distinguishing between major and minor tonalities. The researcher scored the ITML T1 by counting the number of incorrect responses and subtracting that from the total possible score of 22. Each participant's total raw score (RS) was entered into the SPSS Statistics independent samples *t*-test. This *t*-test served to compare the mean scores of the experimental and control groups to determine whether there was statistical evidence that the means from these two groups were significantly different.

Given the design and limitations of the present study, the answer to RQ2 is that there is no statistically significant difference between the tonal listening music achievement scores of beginning band students instructed with a sound-before-sight vocalization technique and those taught with a traditional note-reading strategy following the nine-week study.

RQ3: Is there a difference in Level 1—Audiation/Reading—Tonal Reading (T2) Perception post-subtest scores of the Iowa Tests of Music Literacy (ITML) between the experimental group (based on music learning theory (MLT) principles) and the control group (based on traditional instructional practices)?

The researcher administered the Iowa Test of Music Literacy Tonal Concepts Level One Audiation/Reading (ITML T2) to answer RQ3, measuring each student's music achievement in audiation reading. The ITML T2 was scored by counting incorrect responses and subtracting that number from the total possible score of 22. Each participant's total raw score (RS) was then entered into the SPSS Statistics independent samples *t*-test, which compared the mean scores of the experimental and control groups to determine if there was a significant difference. The study's design and limitations indicated a statistically significant difference between the tonal reading music achievement scores of beginning band students instructed with a sound-before-sight vocalization technique and those taught with a traditional note-reading strategy after the nine-week study.

Delimitations/Limitations

Understanding and communicating a study's delimitations and limitations encourages transparency and strengthens the credibility of the research. This practice demonstrates that the researcher has critically evaluated their work and openly acknowledged the study's strengths and weaknesses. Future researchers can use this information to inform their research, addressing gaps and refining methodologies, thereby advancing knowledge and understanding.

Sample Size

Before commencing the study, the researcher defined various delimitations, including selecting a convenience sample of first-year band students and specifically excluding students not in the fourth or fifth grade. The availability of participants and resource limitations affected several logistical aspects, such as the study's design, location, and the small sample size. This delimitation might not fully represent the diversity of beginning band students across all

programs. Consequently, the sampling method restricted how broadly the study's results could be applied, making them relevant primarily to the specific conditions of this study. This delimitation could have potentially impacted the study's outcomes.

Although convenience sampling was necessary for this research project, future researchers should consider using a larger sample size by extending the research to other school districts. The sample size can significantly affect the quality of research findings.[4] Increasing the sample size provides several benefits, including a more precise detection of effects and differences between the experimental and control groups, which enhances confidence in the findings. A larger sample size also broadens the applicability of the findings to a larger population and reduces the influence of outliers, which can disproportionately impact smaller sample sizes.

Study Design and Testing Procedures

The decision to use a quantitative rather than a qualitative design restricted the study's capacity to fully capture the complexity and richness of human experiences and observed behaviors. This limitation hindered the researcher's ability to fully comprehend the phenomenon under study. A qualitative design would have allowed a more in-depth exploration of participants' experiences and facilitated finding other beginning band directors who employ a sound-before-symbol approach. Learning about real-world experiences from various band directors would have provided the researcher with valuable insights into implementation strategies and the benefits of using a sound-before-symbol approach. However, due to this limitation, the study relied on testing procedures and statistical analysis, reducing the potential

[4] Laerd Statistics, "Sampling: The Basics," The Online Research Guide for Your Dissertation and Thesis | Lærd Dissertation, accessed March 24, 2024, https://dissertation.laerd.com/sampling-the-basics.php.

depth of understanding the benefits of audiation and vocalization techniques in real-life beginning band settings. Future researchers should consider combining qualitative and quantitative approaches. Qualitative methods offer deeper insights into participant experiences, while quantitative studies allow researchers to investigate phenomena systematically and objectively, with precision. This combined approach would offer a more comprehensive understanding of the phenomenon under study.

This study design encountered an additional limitation due to the use of three testing procedures, which required the researcher to apply the Bonferroni correction. While multiple testing procedures can provide a more comprehensive analysis, they also increase the risk of Type 1 errors, where the likelihood of incorrectly rejecting a null hypothesis increases. To mitigate this, the researcher applied the Bonferroni correction, which adjusts the significance threshold to account for the number of tests conducted. However, this adjustment made the level of significance much lower ($\alpha = 0.017$) compared to using only one post-test ($\alpha = 0.05$), thereby increasing the probability of Type II errors or failing to detect a true effect. Consequently, this approach could have reduced the statistical power of the study, potentially overlooking meaningful findings that could have been identified with a less stringent significance level. Future researchers should carefully consider the number of tests to employ when designing their study. Although using the Bonferroni correction is essential when conducting multiple tests, it can limit the overall impact and sensitivity of the research outcomes.

Study Duration

The researcher scheduled this study to commence near the start of the school year and extend for nine weeks. This timing was ideal for researching beginning band students; however, interruptions such as fall break, the Thanksgiving holiday, and preparations for a Christmas

concert disrupted the overall schedule. These logistical challenges compressed the instructional timeline, forcing the researcher to cover all necessary objectives and lessons within a shorter timeframe.

Future researchers should consider conducting semester-long or year-long studies to allow more time to examine the effects of the sound-before-symbol approach compared to a traditional note-by-note strategy. A longer duration would give researchers more time to delve into pattern instruction and improvisation techniques, manage time constraints more effectively, and allocate additional time for testing procedures. Designing studies with a more extended timeframe would enable researchers to observe the development of audiation skills in beginning band students over time, enhancing the reliability and validity of the findings.

Pilot Study

Another limitation of this study was the absence of a pilot study. Without evaluating the feasibility and effectiveness of the methods and procedures beforehand, the researcher encountered challenges during the primary research. It became apparent that conducting a pilot study would have been advantageous. Preliminary research could have helped the researcher address the complexities of simultaneously assuming the roles of teacher and researcher, managing two groups, and navigating time constraints.

Recommendations for Future Study

Pilot Study

Future researchers are advised to conduct a pilot study to refine research procedures before initiating the main study. This preliminary phase would provide an opportunity to define and adjust objectives for efficiency and effectiveness, ensuring that study objectives align with

the research questions and overall aims. A pilot study would allow researchers to explore test assessment methods, refine data collection techniques, and improve participant recruitment strategies. It also will enable researchers to address any unforeseen challenges that may arise during the primary research phase.

Vocalization Across All Instrumental Education Levels

Although this study focused on beginning band students, applying the same treatment and testing procedures across different age groups could yield valuable insights into music aptitude, audiation, and musical achievement growth when employing a sound-before-sight methodology. Investigating age-specific vocalizing techniques may reveal patterns in the progression of how instrumentalists best develop their technical and audiation skills over time. This longitudinal perspective can help music educators tailor vocalizing strategies to specific age groups.

Collaboration

Gordon asserts, "Students learn two instruments, their audiation instrument and the actual music instrument. To make satisfactory progress in instrumental music, they first learn their audiation instrument as readiness for learning to play an actual musical instrument."[5] In line with this perspective, the researcher proposes collaborating and partnering with general music teachers and other band directors to exchange ideas on prioritizing aural readiness in beginning band lessons. Music departments can collaborate to develop supplementary materials with sequential aural/oral exercises to equip students with the ability to audiate music before playing an instrument.

[5] Gordon, *Learning Sequences*, 290.

Implications for Practice

This study's findings indicate no statistically significant differences between the experimental and control groups for RQ1 and RQ2 but a significant outcome for RQ3. The statistically significant difference observed in the tonal reading music achievement scores between beginning band students instructed with a sound-before-sight vocalization technique and those taught with a traditional note reading strategy warrants further investigation into the implications of this finding. In a beginning band setting, prioritizing vocalization before reading is not always a widely accepted or popular teaching method. When the researcher examined the measures of central tendency (see Table 34), the data revealed growth in mean scores for all students. However, the students in the experimental group, who received instruction using a sound-before-symbol approach, exhibited more significant growth across all three tests than the students in the control group. Table 34 highlights this substantial increase in mean change scores in the experimental group compared to the control group for the ITML T2 and IMMA TS tests. This observation suggests that implementing a sound-before-sight instructional strategy significantly impacted the mean scores in the post-assessment phase.

Table 34. Pre/Post Mean Change Scores: Exp. vs. Ctrl. Groups Comparison

	Experimental			Control		
Variable	N	*M*	*SD*	*N*	*M*	*SD*
ITML T1 Pre	22	14.91	3.09	19	15.37	2.69
ITML T1 Post	22	16.18	3.19	19	16.42	3.02
Change Scores		1.27			1.05	
ITML T2 Pre	21	15.10	2.83	20	14.95	2.67
ITML T2 Post	21	18.70	1.75	20	16.86	2.56
Change Scores		3.6			1.91	
IMMA TS Pre	18	33.80	2.80	20	34.05	2.86
IMMA TS Post	18	35.65	2.35	20	34.35	3.03
Change Scores		1.85			0.3	

The alignment of this observation with the Pestalozzian theoretical framework and the research findings of educational pioneers underscores the significance of sound-before-symbol instruction. Scholars such as Mason, Gordon, Kodály, Orff, and Suzuki have long recommended this approach. Additionally, prominent empirical researchers within this field, including authors and educators such as Azzara,[6] Bluestine,[7] Byo,[8] Dalby,[9] Grunow,[10] Lange,[11] Runfola,[12] and Taggart,[13] have raised awareness of the effectiveness of a sound-before-symbol approach through their research and publications. The scholarly contributions of these influential theorists and educators suggest that the sound-before-symbol approach is likely to result in more favorable outcomes in music achievement and performance compared to traditional note-by-note instructional methods in beginning band programs. Their findings demonstrate the practicality and effectiveness of integrating sound-before-sight techniques into beginning band instruction, enhancing students' aural skills, sight-singing abilities, and overall musical fluency.

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[6] Azzara, Christopher, "Eastman School of Music," accessed March 24, 2024, https://www.esm.rochester.edu/directory/azzara-christopher/.

[7] Eric M. Bluestine, "GIA Publications - The Ways Children Learn Music," accessed March 24, 2024, https://giamusic.com/resource/ways-children-learn-music-book-g5480.

[8] James Byo, "Welcome to LSU, a Top Research University | Baton Rouge, La," accessed March 24, 2024, https://www.lsu.edu/cmda/music/people/faculty/byo.php.

[9] Bruce Dalby, "The University of New Mexico Department of Music - College of Fine Arts," accessed March 24, 2024, https://music.unm.edu/faculty/bruce-dalby/.

[10] Grunow, Richard F, "Eastman School of Music," accessed March 24, 2024, https://www.esm.rochester.edu/directory/grunow-richard/.

[11] Diane M. Lange, "The University of Texas at Arlington," accessed March 24, 2024, https://www.uta.edu/academics/faculty/profile?username=lange.

[12] Maria E. Runfola, "Graduate School of Education - University at Buffalo," last modified January 22, 2024, https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=runfola.

[13] Cynthia Taggart, "GIA Publications," accessed March 24, 2024, https://giamusic.com/artists/cynthia-taggart.

Summary

This quantitative experimental study investigated the impact of a sound-before-sight strategy employing vocalization techniques on beginning band students compared to traditional note-reading methods. Using a quantitative, experimental approach, the researcher conducted independent samples *t*-tests to compare the mean music aptitude scores and tonal music achievement test scores between the experimental and control groups. Additionally, paired *t*-tests were employed to examine the within-group differences before and after the vocalization instructional intervention. The results informed the conclusions for the research questions and null hypotheses.

Over nine weeks, the researcher instructed two groups of beginning band students. One group received traditional note-reading instruction, while the other group learned using a sound-before-sight strategy involving vocalization and audiation skill development through singing and listening activities. Rooted in the sound-before-symbol philosophies of Pestalozzi, Mason, and Gordon, the study aimed to investigate the effectiveness of this approach to beginning band instruction compared to traditional methods.

The researcher conducted three standardized music aptitude and achievement tests as both pre-tests and post-tests. The study anticipated significant enhancements in music aptitude and tonal concepts, indicating a deeper grasp of music among the students in the experimental group. The treatment was also expected to yield noticeable performance improvements, such as enhanced intonation discernment, playing fluency, precision in rhythmic execution, and heightened musical sensitivity.

Upon analyzing the study data, the ITML T1 and IMMA TS test results did not show significant differences. However, the ITML T2 test demonstrated statistical significance. Despite

the lack of significant results for the ITML T1 and IMMA TS tests, the paired *t*-test results provided additional insights that were not initially apparent from the independent samples *t*-tests. The comparison of mean change scores through paired *t*-tests revealed higher scores for the experimental group, offering valuable insights into the benefits of vocalization and sound-before-symbol approaches in a beginning band setting (see Table 35).

Table 35. Paired Samples *t*-Test: Exp. & Ctrl. Groups Comparison

	Experimental				Control			
Variable	*t*	*df*	*Sig. (2-tailed)*	*Mean Difference*	*t*	*df*	*Sig. (2-tailed)*	*Mean Difference*
ITML T1	1.91	21	.07	1.27	1.07	18	.30	.684
ITML T2	8.34	19	<.001	3.50	4.07	20	<.001	1.91
IMMA TS	2.98	17	.008	1.67	.58	20	.566	.33

The findings of this study offer meaningful insights into the ongoing exploration of effective instrumental instructional practices. Through the experimental procedures, comparative data from independent and paired samples *t*-tests, and the implications and recommendations discussed, this study can potentially transform how instrumental programs approach readiness preparation and the implementation of vocalization strategies for beginning band students. The researcher contends that the timeless practice of audiation, the ability to comprehend music mentally, has roots dating back to ancient Biblical times. This assertion supports Paul's words: "...I will sing praise with my spirit, *but I will sing with my mind also*" (1 Cor. 14:15, ESV; emphasis added). Paul's statement not only underscores the presence of audiation, often described as "singing in the mind," but also highlights its enduring value throughout history. This insight emphasizes the historical significance of audiation in developing musical skills,

underscoring the necessity to continue cultivating and refining this essential aspect in music education, particularly within the context of beginning band settings.

Based on the findings of this experimental study, the researcher concludes with a challenge to all beginning band music educators, encouraging them to embrace change and recognize the significance and benefits of preparing students to learn music notation through a sequential sound-before-sight approach. This nontraditional strategy can facilitate a deeper understanding and appreciation of musical concepts among students from the start of their musical journey. Numerous research studies indicate that promoting audiation skill development through a sound-before-sight method within a beginning band setting can significantly improve music achievement scores and enhance students' musical listening, singing, and playing abilities. This innovative approach fosters readiness for note-reading and establishes a solid framework for developing musical skills. Through activities such as listening, chanting, singing, solfège signing, and "singering," students actively engage their minds, ears, voices, and bodies to develop independence, sensitivity, creativity, and expressiveness – a musical foundation that will accompany them throughout their lifetime.

Appendix A: IRB Approval

Date: 10-17-2023

IRB #: IRB-FY23-24-396
Title: The Singing Instrumentalist: A Sound-Before-Sight Approach in Instrumental Instruction
Creation Date: 9-6-2023
End Date:
Status: Approved
Principal Investigator: Tammy Bartz
Review Board: Research Ethics Office
Sponsor:

Study History

Submission Type Initial	**Review Type** Expedited	**Decision** Approved

Key Study Contacts

Member Tammy Bartz	**Role** Principal Investigator	**Contact** [redacted]
Member Tammy Bartz	**Role** Primary Contact	**Contact**
Member Nathan Street	**Role** Co-Principal Investigator	**Contact**

Appendix B: Formal Request to Superintendent of Houston Public Schools

August 22, 2023

Dear Superintendent, Morem,

As a doctoral candidate in the School of Music at Liberty University, I am conducting research as part of the requirements for a Ph.D. degree in music education. The title of my research project is "The Singing Instrumentalist: A Sound-Before-Sight Approach in Instrumental Instruction." The purpose of this study is to learn if a nontraditional beginning band teaching approach involving vocalization techniques such as singing, chanting, and "singering" would benefit learning how to play an instrument. To understand this more fully, I will be gathering data through pre- and post-tests designed and researched by a music researcher and educator, Edwin Gordon. Gordon was interested in how children learn and understand music. He believed that music should be taught in the same process as teaching children how to speak, read, and write, which begins with listening. His research showed that students who are instructed by first hearing songs (listening) and then singing (speaking) will set them up for better comprehension, rhythmic accuracy, and good intonation when it comes to reading, performing, and eventually composing (writing) music. Gordon believes if students do not learn to sing the music before they play, they will be limited to simply decoding notes. I have been teaching the traditional way for over ten years, and if you have heard my beginning bands, you know it works! Since being introduced to Gordon's music learning theory, I have gradually experimented with incorporating singing techniques into my teaching style and have observed positive outcomes. I am excited to experience the potential results of integrating this music learning theory into my beginning band program. I am excited to conduct my own research to learn if this strategy could increase music aptitude and levels of achievement more significantly than students who are instructed the traditional way.

I am writing to request your permission to conduct my research at Houston Elementary School.

Participants in this study will be asked to do the following:

1. Beginning band students will participate face-to-face in weekly group instrumental lessons that will be 20 minutes each. Weekly group lessons are a normal procedure for all students who enroll in the band.
2. This study will last for nine weeks; however, lessons will continue as normal once the research project is complete.
3. Before the weekly lessons begin, beginning band students will participate in two paper and pencil pre-tests that will offer baseline data on their music aptitude and music achievement. These reliable and valid tests were designed by Edwin Gordon, a music researcher, theorist, and teacher. Test one is called the *Music Aptitude Test*, and test two

is the *Iowa Tests of Music Literacy*. Each test will take 20 minutes with a total time investment of 40 minutes.

4. There will be two groups in this study:
    a. Group A will be a control group where students will be instructed the traditional way by following the *Standard of Excellence: Comprehensive Band Method: Book One* method book. This book includes no singing and begins with learning the fingerings, notes on the staff, and rhythm reading at the onset of instruction. This is called note instruction.
    b. Group B will be an experimental group, and students in this group will be instructed in vocalization techniques.
        - Students will be instructed to listen to the teacher sing songs first on a neutral syllable (‘bum,’ ‘doo,’ or ‘too’).
        - Students will then echo sing. Once the melody is learned on a neutral syllable, the lyrics will be added by listening to the teacher chant the words and echo them back.
        - The rhythm will be introduced through melodic chant, then the teacher will sing the lyrics, and the students will repeat after her.
        - Eventually, the students will transfer these melodic patterns to their instruments without reading notes. This instructional method is called rote instruction.

5. Instrumental lessons will be grouped by instruments. Each student will be randomly placed in either Group A or Group B. The selection process will be done with each instrumental group using a lottery method where all students’ first names will be entered into an online random name picker site, “Wheel of Names” (wheelofnames.com).
6. At the end of the research project, all beginning band students will participate in two paper and pencil posttests. The data gathered will be used to measure the difference in data collected from the pre-tests. This data will help determine the effectiveness of each instructional style. Each test will take 20 minutes and will last for a total of 40 minutes.
7. After the study has concluded, the control group participants will have the opportunity to receive singing and vocalizing interventions within their weekly lessons.

Participants will be presented with informed consent information before participating. Participating in this study is entirely voluntary, and participants are welcome to discontinue participation at any time.

Thank you for considering my request. If you grant permission, please provide a signed statement on an official letterhead indicating your approval. A permission letter document is attached for your convenience.

Sincerely,
Tammy Bartz
Elementary Band Instructor
[redacted]

Appendix C: Letter of Permission

Houston
Public Schools
LEADING IN LEARNING

[redacted]

August 22, 2023

Tammy Bartz
Elementary Band Instructor
[redacted]

Dear Tammy Bartz:

After carefully reviewing your research proposal entitled *The Singing Instrumentalist: A Sound-Before-Sight Approach in Instrumental Instruction*, I have decided to grant you permission to conduct your study at the Houston Elementary School in Houston, Minnesota.

Check the following boxes, as applicable:

☒ I grant permission for Tammy Bartz to contact the students and parents of beginner band students to invite them to participate in her research study.

☑ I request a copy of the results upon study completion and/or publication.

Sincerely,
[redacted]
Mary Morem
Superintendent
Houston Public Schools

DISCOVER, DEVELOP AND ACHIEVE POTENTIAL WITHIN ALL LEARNERS

Appendix D: Recruitment Letter

Dear Parent or Guardian,

Hello! My name is Tammy Bartz, and I am your child's band teacher! I am so happy to have them in the band! We are off to a splendid start!

I am sending this packet of information home to you because I am requesting your child's help with a research project I am doing! I need your and your child's approval to use their data in my research project.

You will read about the project in-depth on the following pages. I will admit it is a lot of detailed information; however, I am required through my university to send it to you in this format.

Here is a short overview of my project and what I am requesting:

1. Your child will be a participant no matter what because they are in the band; however, I need your and their permission to use their data in my research paper.
2. I have randomly divided the students into two groups. Following the method book, one group will be taught the traditional way I have always taught. The other group will be taught much the same way, except that I will be having them sing their notes, chant rhythms on neutral syllables, sing the songs they are learning, and sing their notes as solfège (do, re, mi, etc.) and as note names (A, B, C, etc.)
3. This project will help me learn how or even if vocalization techniques in instrumental instruction will affect their post-test scores.
4. Your child will only be identified by a number in my research – no names will be used!

<u>Here is what I am requesting from you:</u>

1. Read through all the information.
2. Fill out the "Music Background Questionnaire" with your child.
3. Locate the highlighted areas at the end of the Parental/Guardian Consent form, print your child's first and last name, and then please sign and date the sheet.
4. Locate the highlighted area on the Child Assent form and have your child sign and date the sheet.
5. Please stuff the stapled packet into the large envelope and have your child bring it back to school the next day to your child's homeroom teacher. Their homeroom teacher will then give it to me.

I am very excited about this research project and would be honored if you allowed your child to help me complete my dissertation!

Please email me with any questions you may have!

Thank you!

Sincerely,
Tammy Bartz [redacted]

Appendix E: Parental Consent Form

Parental Consent

Title of the Project: "The Singing Instrumentalist: A Sound-Before-Sight Approach in Instrumental Instruction"

Principal Investigator: Tammy Bartz, Doctoral Candidate, School of Music, Liberty University.

Invitation to be part of a Research Study

Your child is invited to participate in a research study. To participate, they must be a 4th or 5th-grade beginning band student at Houston Elementary. Taking part in this research project is voluntary.

Please read this entire form and ask questions before deciding whether to allow your child to participate in this research project.

What is the study about, and why are we doing it?

This quantitative experimental study will examine the impact of two differing instructional strategies on beginning band instruction. One approach will adhere to a traditional method emphasizing technical proficiency and note-reading skills. In contrast, the other will prioritize aural skill development through listening, chanting, singing, solfège signing, and "singering" techniques. Post-test scores of the IMMA Tonal Subtest (TS), the ITML for Audiation/Listening (T1), and the ITML for Audiation/Reading (T2) will be analyzed to assess the effectiveness of each instructional approach in enhancing students' musical aptitude and achievement. I seek to learn if vocalization strategies will increase music aptitude and achievement scores more significantly than students instructed in traditional note recognition. This experimental study aims to determine whether the test results will provide data that can encourage beginning band instructors to integrate vocalization strategies into their teaching methods and inspire the creation of a nontraditional beginning band method book incorporating vocalization activities.

What will participants be asked to do in this study?

If you agree to allow your child to be in this nine-week study, I will ask them to do the following:

1. All participants will answer survey questions about age, grade, and private music instruction history. This survey will take 10 minutes.

2. All participants will complete the Intermediate Measures of Music Audiation (IMMA TS) standardized tonal pre- and post-tests. This standardized test will measure student tonal music aptitude. This measures a child's potential in music before receiving instruction. These tests will take 20 minutes each time, for 40 minutes. The scores between the tests will be compared.

3. All participants will complete the tonal concepts - level one of the Iowa Tests of Music Literacy (ITML) T1 Audiation/Listening and T2 Audiation/Reading. This standardized test will measure student music listening and reading. Pre- and post-tests will be administered to measure student music achievement growth. Each time the test is administered, it will take 20 minutes to complete for 40 minutes.

4. All participants will participate in face-to-face weekly group instrumental lessons that will be 20 minutes each.

    - Lessons will be grouped by like instruments. This study will have two groups; your child will be randomly placed in either Group A or B. The selection process will be done with each instrumental group using a lottery method where all students' first names will be entered into an online random name picker site, 'Wheel of Names' (wheelofnames.com).

    A description of the instructional procedures for each group is below:

        - Group A will be a control group where students will be instructed the traditional way by following the *Standard of Excellence: Comprehensive Band Method: Book One* method book. This book includes no singing and begins with learning the fingerings, notes on the staff, note values, and rhythm reading at the onset of instruction. This group will be instructed with an emphasis on note reading.

            1. Week One: During this week, the music instructor will meet with all students in grades four and five to demonstrate each instrument and discuss the process of selecting an instrument should they enroll in the beginning band program. All interested students will be given a letter to go home explaining the band tryouts process. Each student will select the top two instruments of their choice to try out. A letter will be sent home once the student and teacher decide on the best instrument. This letter will explain how to contact the music store of their choice to discuss rental or purchase agreements about the instrument their child will play. The lessons can begin once all the instruments are delivered to the elementary school. During this week, all students who are interested in enrolling in the band will take two pre-tests: Intermediate Measures of Music Aptitude Tonal Subtest (IMMA TS) and the Iowa Tests of Music Literacy (ITML) T1 Audiation/Listening and T2 Audiation/Reading.
            2. Week Two: Assuming the instruments have been delivered, all beginning band students will be instructed on how to assemble their instruments, how to hold them, and how to make their first sounds. The students in Group A will learn the notes of the staff and will begin with pages six and seven. Students will

review the technical concepts and playing exercises introduced in their method book each subsequent week. They will be assigned one page each week and will learn the same songs as Group B; however, they will not be instructed to sing or think in sound.

- Group B will be an experimental group, and students in this group will be instructed using vocalization techniques. This strategy will employ singing and learning the lyrics to eight simple folk songs. These songs will also be learned on their instruments.

    1. Week One: During this week, the music instructor will meet with all students in grades four and five to demonstrate each instrument and discuss the process of selecting an instrument should they enroll in the beginning band program. All interested students will be given a letter to go home explaining the band tryouts process. Each student will select the top two instruments of their choice to try out. A letter will be sent home once the student and teacher decide on the best instrument. This letter will explain how to contact the music store of their choice to discuss rental or purchase agreements about the instrument their child will play. The lessons can begin once all the instruments are delivered to the elementary school. During this week, all students who are interested in enrolling in the band will take two pre-tests: Intermediate Measures of Music Aptitude Tonal Subtest (IMMA TS) and the Iowa Tests of Music Literacy (ITML) T1 Audiation/Listening and T2 Audiation/Reading.

    2. Week Two: Assuming the instruments have been delivered, all beginning band students will be instructed on how to assemble their instruments, how to hold them, and how to make their first sounds. They will learn the fingerings to the three notes necessary to play the song “Hot Cross Buns.” They will play each note and be able to produce a sound on each note, echoing the instructor using various simple rhythms. The articulation of “too” will be explained. Students will then listen to the teacher sing the song “Hot Cross Buns,” and then they will echo sing the song. Next, the students will be instructed to echo the song by singing the three-note letter names and fingering the notes on their instruments as they sing (“singering”). Once the students can sing the song on the letter names and finger them, they will be instructed to echo the teacher as she plays the song one measure at a time. No notations will be introduced in this lesson. Students will only use their listening, singing, and thinking skills. Students will be encouraged to discover or

create independently throughout the week other three-note songs they could perform and practice on their instrument.

3. Week Three: Students will first review "Hot Cross Buns" by singing. Students will review hand positions for the three notes and then finger and sing the notes on the letter names. Finally, students will play "Hot Cross Buns" as a group and solo. During this week, students will learn "Merrily We Roll Along" following the same sequential process of week one: singing lyrics, singing note names, "singering" notes, and then playing as in week one. Students will be introduced to an additional note to play the song "Good King Wenceslas."

4. All subsequent instruction for weeks four through eight will introduce a new song following the same sequence of singing, chanting, fingering, and playing by ear. During week four, students will be introduced to notation on the staff for the songs they learned in weeks one through three. The words and the letter names will be included under the staff, and students will be instructed to play the previously learned songs by following the notes on the staff. Weeks five through eight will continue to reveal the notation of each song learned the week before.

5. The instructional emphasis for Group B will be listening, singing, and playing by ear.

6. Week nine will be used to administer the three posttests: the IMMA, ITML T1, and ITML T2 mean scores for these tests will be used to reveal the effectiveness of teaching through singing strategies before the introduction of notation compared to a traditional beginning band instructional method of notation introduced at the onset of instruction.

After the study has concluded, the control group participants will have the opportunity to receive singing and vocalizing interventions within their weekly lessons.

How could participants or others benefit from this study?

The direct benefits to all students participating in this study include: 1) developing musical skills that will remain with them during and beyond their formal education; 2) learning how to play an instrument, participating alone and in a group, and performing in a band setting, and 3) learning lifelong skills of leadership, organization, dedication, and teamwork that can help them develop into active, creative, culturally aware, and productive members of society.

Benefits to music education include offering specific data comparing a traditional instructional method to a nontraditional method of vocalization and singing techniques. Research such as this study is necessary to provide educators with valuable information that will inform their instruction and help them become more effective teachers. The results of this study may help inspire beginning band teachers to develop new listening and vocalizing techniques to improve the quality of their beginning band instruction.

What risks might participants experience from being in this study?

The expected risks from participating in this study are minimal, which means they are equal to the risks your child would encounter in everyday life.

I am a mandatory reporter. During this study, if I receive information about child abuse, child neglect, elder abuse, or intent to harm self or others, I will be required to report it to the appropriate authorities.

How will personal information be protected?

The records of this study will be kept private. Published reports will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher will have access to the records.

- Participant responses to the questionnaire and all testing procedures will be kept confidential by replacing names with numeric codes.
- Data will be stored on a password-locked computer and in a locked file cabinet. After three years, all electronic records will be deleted, and all hardcopy records will be shredded.
- Recordings will be stored on a password-locked computer for three years and then deleted. The researcher and members of her doctoral committee will have access to these recordings.

What are the costs to be a part of the study?

For your child to participate in the research, you will need to purchase or rent an instrument ($30 - $50 monthly, depending on the instrument chosen) unless you already own one. You will also be asked to purchase a method book ($10.00).

Is the researcher in a position of authority over participants, or does the researcher have a financial conflict of interest?

The researcher serves as a teacher at Houston Elementary School. To limit potential or perceived conflicts, your child's band teacher will ensure that all data is stripped of identifiers before any researcher receives it. This disclosure lets you decide if this relationship will affect your willingness to allow your child to participate in this study. No action will be taken against an individual based on their decision to allow their child to participate in this study.

Is study participation voluntary?

Participation in this study is voluntary. Your decision to allow your child to participate will not affect your or their current or future relations with Liberty University. If you allow your child to participate, they are free not to answer any question or withdraw at any time.

What should be done if a participant wishes to withdraw from the study?

If you choose to withdraw your child from the study or your child decides to withdraw, please contact the researcher at the email address/phone number included in the next paragraph. Should you choose to withdraw them, or your child decides to withdraw, data collected from your child will be destroyed immediately and will not be included in this study.

Whom do you contact if you have questions or concerns about the study?

The researcher conducting this study is Tammy Bartz. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her [redacted] or [redacted]You may also contact the researcher's faculty sponsor, Dr. Nathan Street[redacted]

Whom do you contact if you have questions about rights as a research participant?

If you have any questions or concerns regarding this study and want to talk to someone other than the researcher, **you are encouraged** to contact the IRB. Our physical address is Institutional Review Board, [redacted]

Disclaimer: The Institutional Review Board (IRB) ensures that human subjects research will be conducted ethically as defined and required by federal regulations. The topics covered and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.

Your Consent

By signing this document, you agree to allow your child to be in this study. Make sure you understand what the study is about before you sign. You will be given a copy of this document for your records. The researcher will keep a copy of the study records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

I have read and understood the above information. I have asked questions and have received answers. I consent to allowing my child to participate in the study.

☐ The researcher has my permission to audio-record my child as part of their participation in this study.

_____

Printed Child's/Student's Name

_____

Parent/Guardian's Signature Date

Appendix F: Child Assent Form

Child Assent Form

What is the name of the study, and who is doing the study?
The name of the study is 'The Singing Instrumentalist: A Sound-Before-Sight Approach in Instrumental Instruction,' and the person doing the study is Tammy Bartz (Mrs. Bartz).

Why is Mrs. Bartz doing this study?
Mrs. Bartz wants to understand better if using vocalization techniques, such as singing songs before learning to play them on an instrument, will make a difference in how beginning band students learn and play. She is curious if singing will help beginning band students learn more quickly, understand more, and hear the musical notes in their heads while they play.

Why am I being asked to be in this study?
You are being asked to be in this study because you are a beginning band student.

What will happen if I decide to be in the study, and how long will it take?
If you decide to be in this study, you will be randomly placed in either Group A or Group B. All beginning band students will learn how to play their chosen band instrument in different ways. You may be placed in a group that will have singing activities included in instruction, or you may be in a group that does not use singing activities. However, both groups will learn how to play the same songs on their instruments and learn the same notes.

Do I have to be in this study?
No, you do not have to be in this study. If you want to be in this study, then tell the researcher. If you don't want to, it's OK to say no. The researcher will not be angry. You can say yes now and change your mind later. It's up to you. You will still be able to be in the beginning band!

What if I have a question?
You can ask questions at any time. You can ask now. You can ask later. You can talk to the researcher, Mrs. Bartz. If you do not understand something, please ask the researcher, Mrs. Bartz, to explain it again.

Signing your name below means that you want to be in the study.

_____

Signature of Child Date

Tammy Bartz [redacted]

Dr. Nathan Street [redacted]

Liberty University Institutional Review Board
[redacted]

Appendix G: Student Music Background Questionnaire

Music Background Questionnaire
(Please Print)

Student Name: _____ Student Grade: _____

Student Age: _____ Student Gender: M or F

Parent/Guardian Name: _____

Parent/Guardian Contact information (email or phone):

_____

1. What private lessons outside of school have you taken? Circle and/or fill in the best options below.
    a. Piano (If yes, how many years? _____)
    b. Voice (If yes, how many years? _____)
    c. Guitar/Ukelele (If yes, how many years? _____)
    d. Other instrument(s): _____
        - (If yes, how many years? _____)
    e. None

2. Have you performed in any music groups outside of school, such as a handbell choir?
    a. No
    b. Yes
    c. If you selected "Yes," please explain what groups and how many years you were involved: (examples are piano lessons for two years, handbell choir for one year, community musicals, church choirs)

        _____

        _____

        _____

Appendix H: Permission Request to The Improving Musician, Andy Mullen

[redacted]

Name: Tammy Bartz
Email: [redacted]
Message: Dear Andy,

Hello! I am a doctoral student writing my dissertation on implementing vocalization techniques based on elements from Gordon's MLT in a beginning band setting. I came across your lovely site and am wondering if I may have permission to use your "Gordon's Skill Learning Sequence" image in my paper.

Thank you for your consideration and for all that you are doing to help music teachers learn about MLT and how to implement its elements into our classrooms.

Sincerely,
~Tammy

Appendix I: Permission Response from The Improving Musician, Andy Mullen

Hi Tammy,

Thanks for the nice note, and for asking about the image. Yes, you may certainly use it, as long as you give me credit, of course.

Good luck on your dissertation!
~Andy

Appendix J: Gordon's Skill Learning Sequence

Created by Andy Mullen

Gordon's Skill Learning Sequence

DISCRIMINATION LEARNING	INFERENCE LEARNING
• Students are taught, and they learn • Information is acquired • Familiar patterns, familiar or unfamiliar order	• Students are guided in how to teach themselves • Students infer the unfamiliar on the basis of the familiar • Familiar and unfamiliar patterns in unfamiliar order
Aural/Oral • The most fundamental level of music. • Students listen and imitate. • Neutral syllables. • Students move to music.	**Generalization** • Students can identify if something is the same or different. • Students can translate patterns from a neutral syllable to solfege. • Students can identify familiar and unfamiliar harmonic and rhythmic functions. • Students can read familiar and unfamiliar music. • Students can identify the tonality or meter of an unfamiliar song.
Verbal Association • Students label the aural sounds from A/O. • Tonal and Rhythm solfege is used to organize sounds. • Students label sounds with harmonic and rhythmic functions.	**Creativity/Improvisation** • Students can make up endings to songs. • Students can have tonal or rhythmic conversations. • Students can improvise over chord changes. • Students can compose their own music.
Partial Synthesis • Students are taught how to discriminate between contexts (tonalities and meters).	**Theoretical Understanding** • The "why" of music. • Students learn the "grammar" of music. • Students learn technical information (lines and spaces, letter names, types of cadences, etc.)
Symbolic Association • Reading at the word level. • Students learn to read the same patterns they were taught at the Verbal Association levels.	
Composite Synthesis • Reading at the sentence level. • Reading with comprehension. • Students learn how to chain patterns together to read longer musical statements. • Students can recognize the tonality and meter of written music.	

Source: Andy Mullen, "Gordon's Skill Learning Sequence: The 30,000 Foot View," The Improving Musician, last modified July 2, 2023, https://theimprovingmusician.com/gordons-skill-learning-sequence-the-30000-foot-view/.

Appendix K: Permission Request to GIA

BJ

Bartz, Tammy Joy

To: [redacted]

Bcc: Bartz, Tammy Joy

Reply | Reply all | Forward

Sat 3/2/2024 12:11 AM

Dear Kathy,

Hello! My name is Tammy Bartz, and I am a doctoral student at Liberty University, currently conducting research for my dissertation. Previously, you and I have had communications via email and phone about testing materials I purchased through GIA Publications.

I am writing this time to request permission to include and reproduce two test documents from GIA Music Publishing as part of my dissertation research on implementing a sound-before-sight approach to beginner band instruction.

I have purchased the ITML and IMMA testing kits through GIA Publications and am requesting to include in my Appendices a screenshot of:

1. The ITML Tonal Concepts Level One Audiation/Listening and Audiation Reading testing sheet
2. The IMMA tonal testing sheet

The reproduced material will be used solely for academic purposes and will be cited appropriately in my dissertation. I will strictly adhere to any guidelines or restrictions set forth by GIA Music Publishing regarding the use of their material.

I am not sure you are the person to contact, but I thought I would start with you 🙂

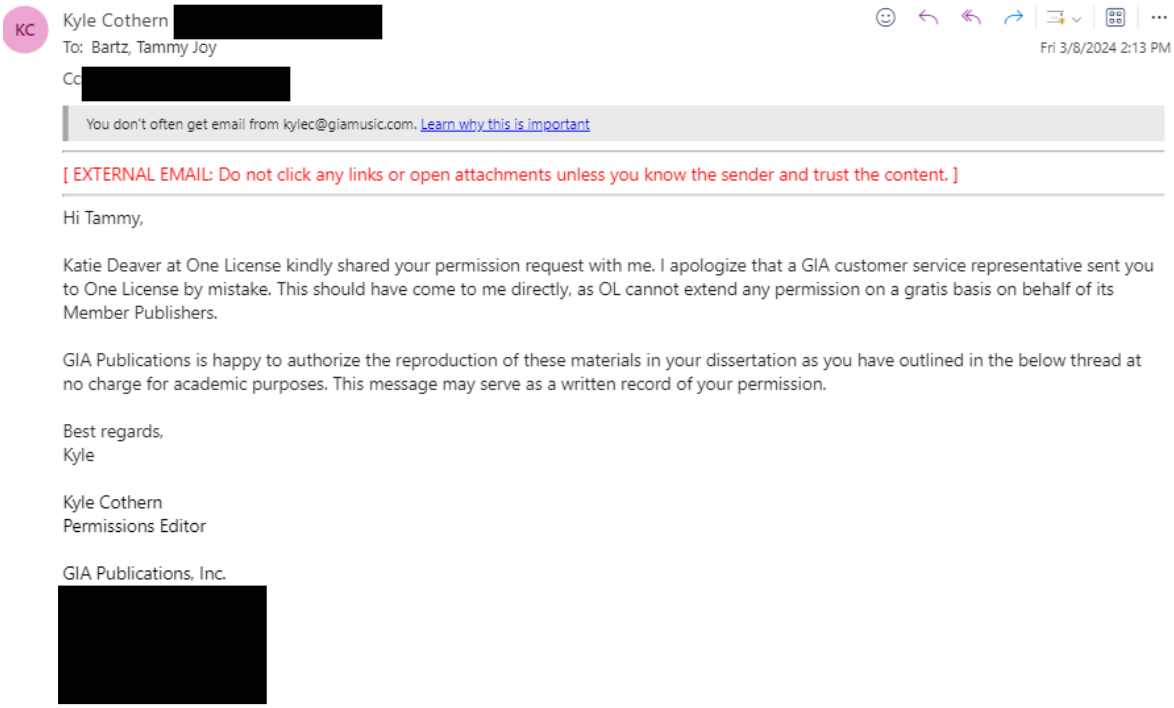
Thank you so much for your help and guidance.

Sincerely,

Tammy Bartz

[redacted]

Appendix L: Permission Response from GIA



KC

Kyle Cothern [redacted]

To: Bartz, Tammy Joy

Fri 3/8/2024 2:13 PM

Cc [redacted]

You don't often get email from kylec@giamusic.com. Learn why this is important

[EXTERNAL EMAIL: Do not click any links or open attachments unless you know the sender and trust the content.]

Hi Tammy,

Katie Deaver at One License kindly shared your permission request with me. I apologize that a GIA customer service representative sent you to One License by mistake. This should have come to me directly, as OL cannot extend any permission on a gratis basis on behalf of its Member Publishers.

GIA Publications is happy to authorize the reproduction of these materials in your dissertation as you have outlined in the below thread at no charge for academic purposes. This message may serve as a written record of your permission.

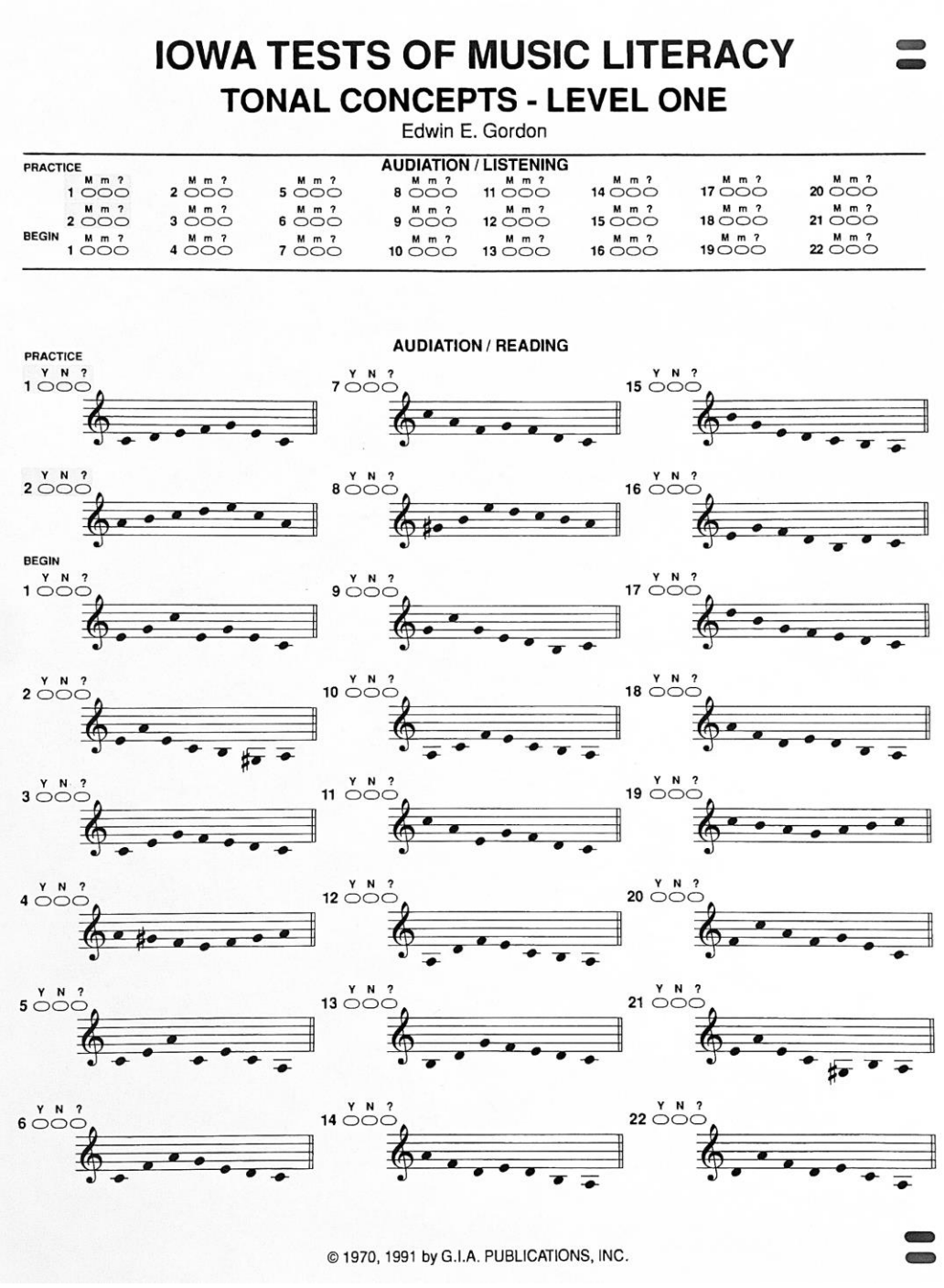
Best regards,
Kyle

Kyle Cothern
Permissions Editor

GIA Publications, Inc.
[redacted]

Appendix M: ITML T1 and T2 Testing Sheet

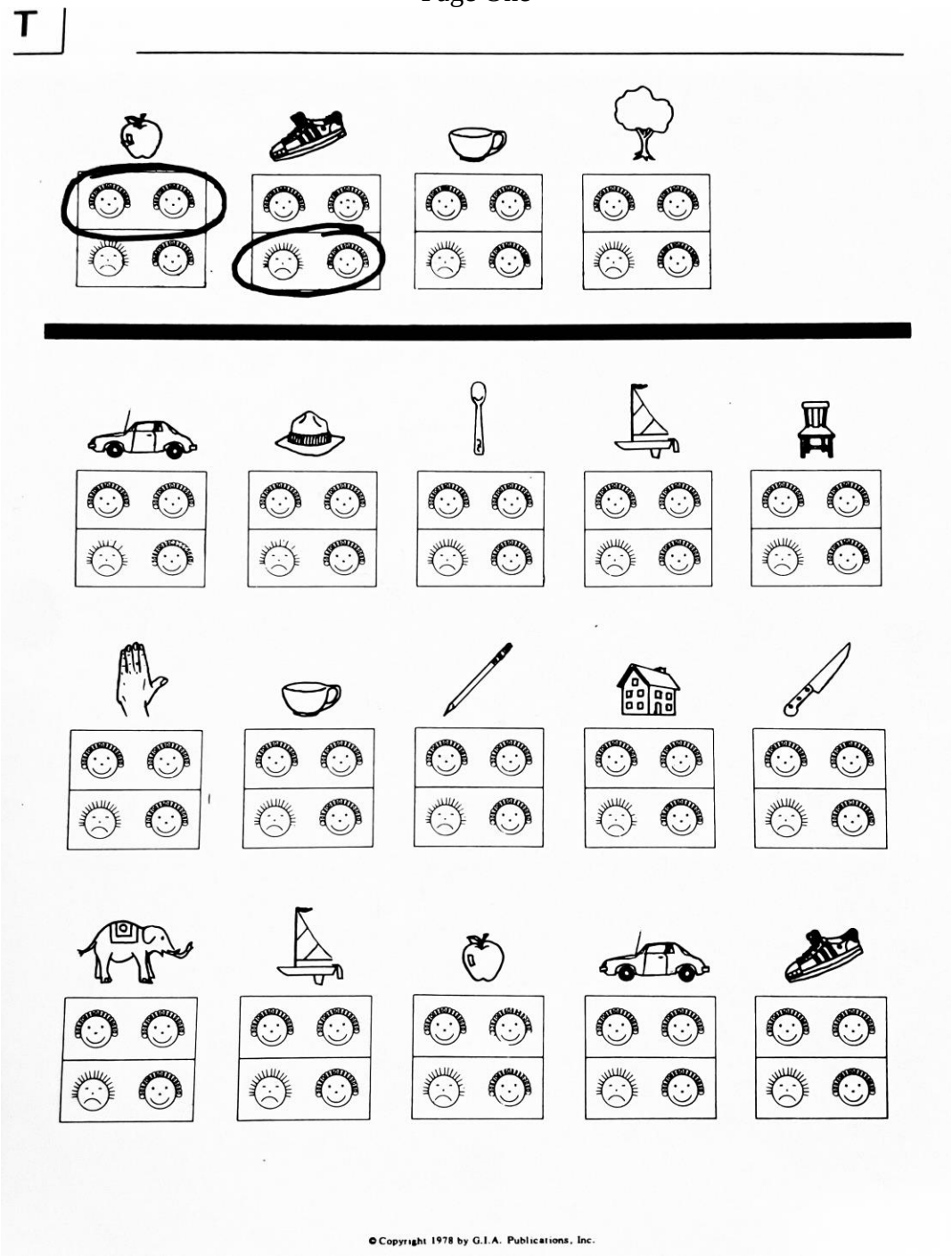
Iowa Tests of Music Literacy
Tonal Concepts Level One
Audiation/Listening (T1) and Audiation/Reading (T2)



Source: Gordon, *Iowa Tests of Music Literacy Manual*. Chicago, IL: GIA Publications, Inc., 1991.

Appendix N: IMMA TS Testing Sheet

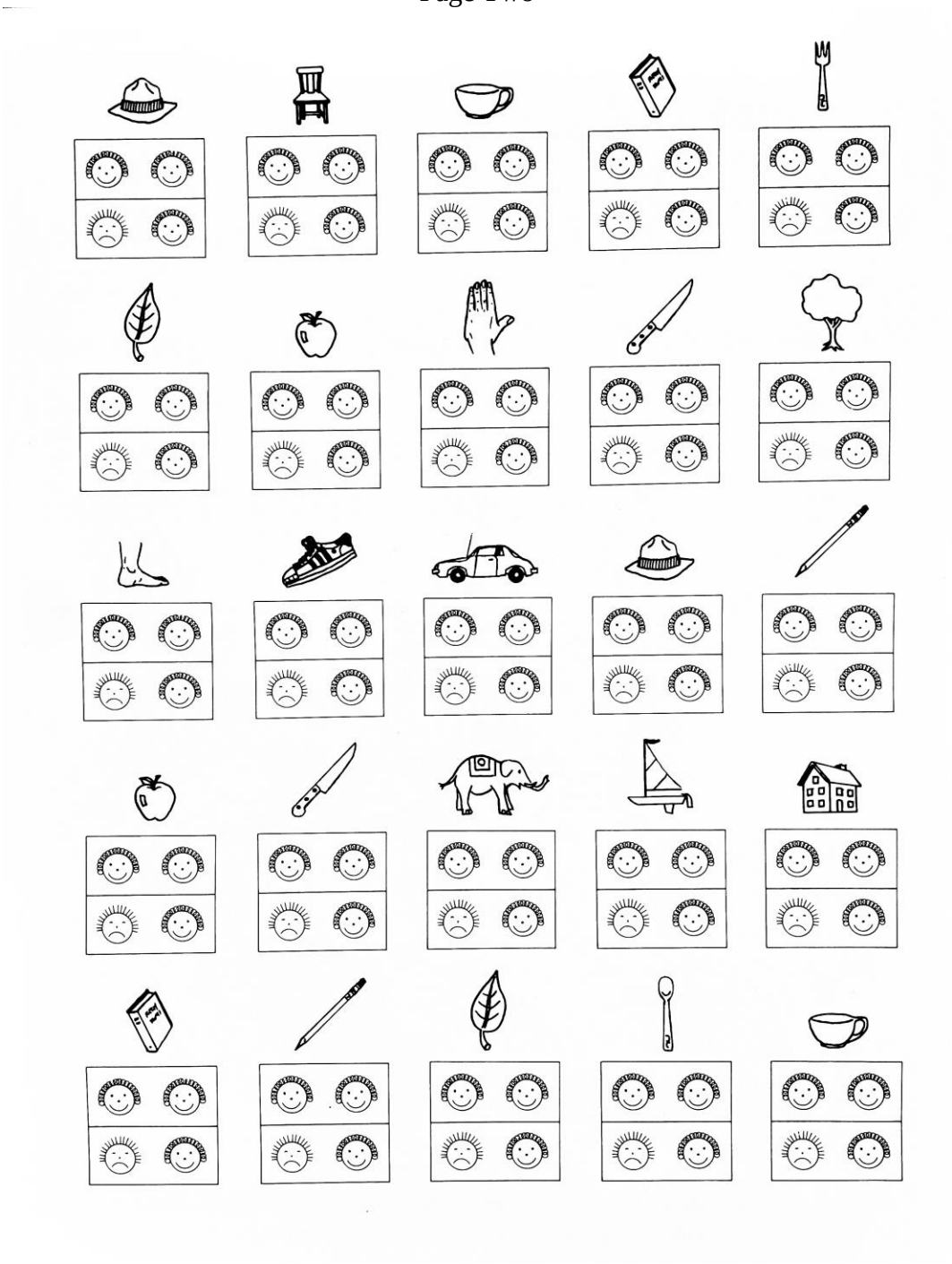
Intermediate Measures of Music Aptitude Tonal Subtest
Page One



Source: Gordon, *Iowa Tests of Music Literacy Manual*. Chicago, IL: GIA Publications, Inc., 1991.

Appendix N Continued: IMMA TS Testing Sheet

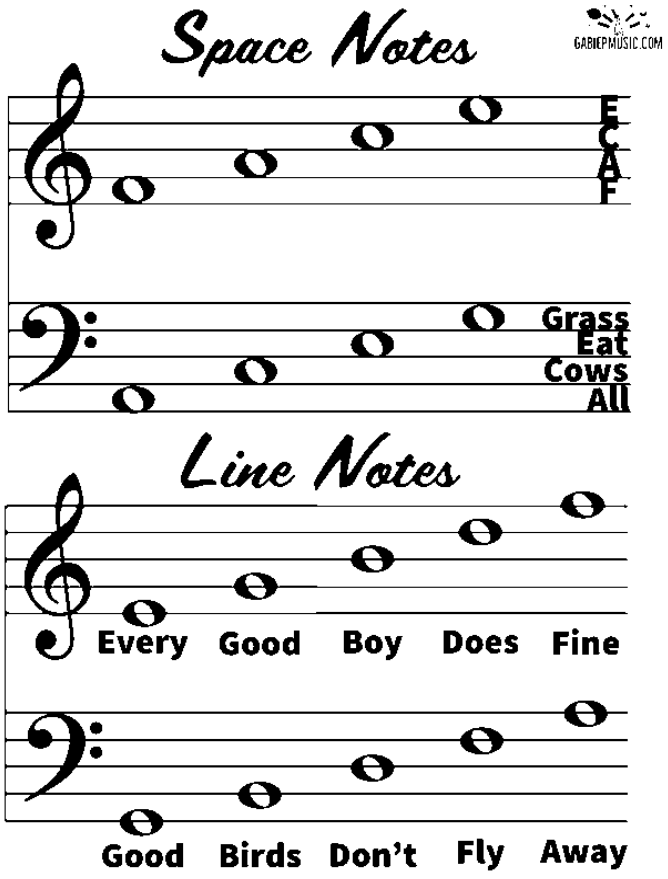
Intermediate Measures of Music Aptitude Tonal Subtest
Page Two



Source: Gordon, *Iowa Tests of Music Literacy Manual*. Chicago, IL: GIA Publications, Inc., 1991.

Appendix O: Grand Staff Mnemonics

Grand Staff Mnemonics	
Clef	Mnemonic
Treble Clef Lines	Every Good, Boy, Does, Fine
Treble Clef Spaces	F, A, C, E
Bass Clef Lines	Good, Boys, Do, Fine, Always/Good, Birds, Don't, Fly, Away
Bass Clef Spaces	All, Cows, Eat, Grass/All, Cars, Eat, Gas



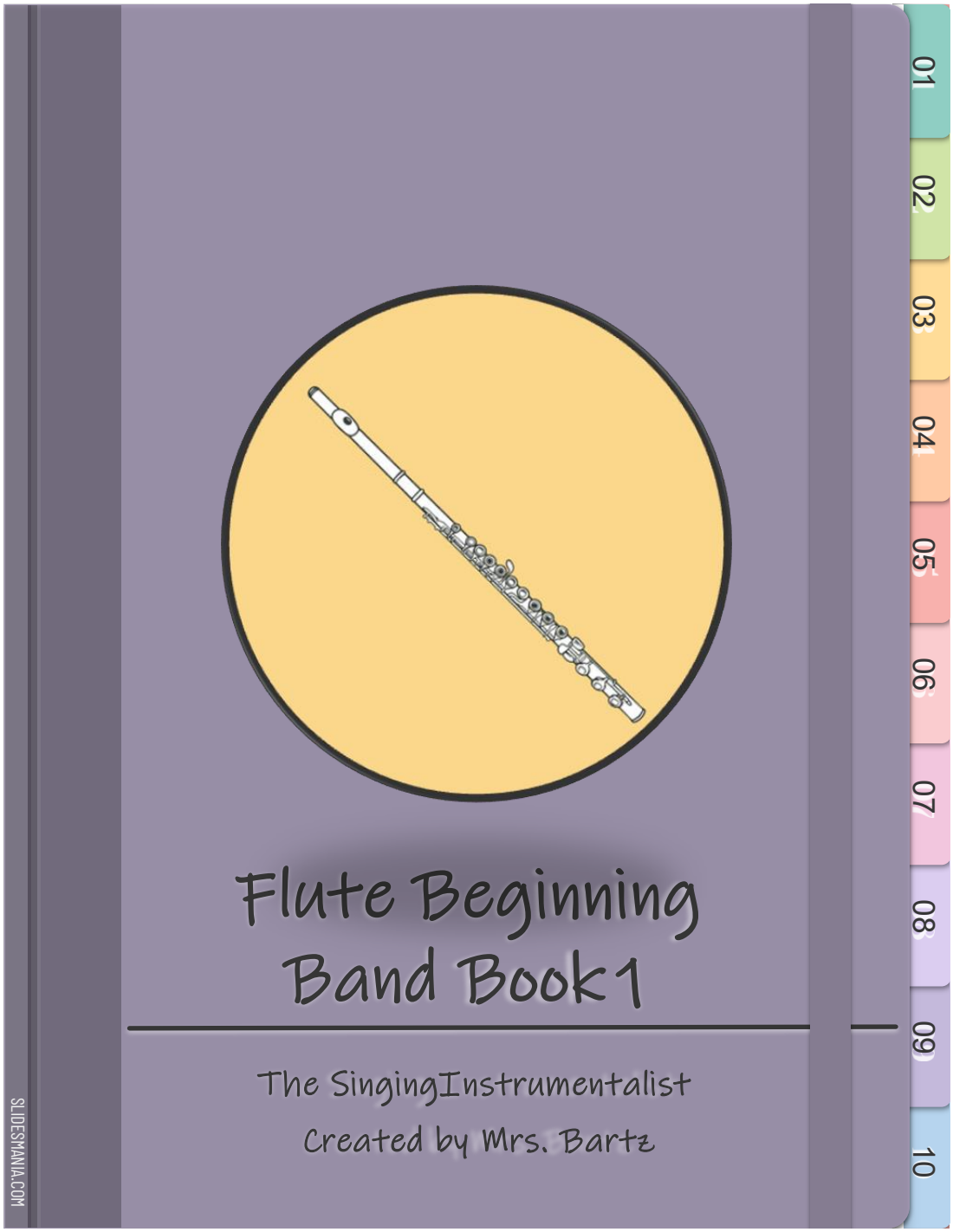
Source: Peacock Piano Studio, "Grand Staff Mnemonics," Teaching Resources & Lesson Plans | TPT, accessed September 1, 2023, https://www.teacherspayteachers.com/FreeDownload/Grand-Staff-Mnemonics-4741164.

Appendix P: Exp. and Ctrl. Group Weekly Assignments

Week	Solfège Pitch: Experimental Group	Concert Pitch: Control Group	Concert Key	Control Group Melodies *Standard of Excellence: Comprehensive Band Method: Book One*	Experimental Group Melodies Created in MuseScore by the researcher
1	do, re, mi	Bb, C, D	B flat Major	"Hot Cross Buns" Page 8, #16	"Hot Cross Buns"
2	do, re, mi, sol	Bb, C, D, F	B flat Major	"Au Claire de la Lune" Page 8, #17	"Au Claire de la Lune"
3	do, re, mi, fa, sol	Bb, C, D, Eb, F	B flat Major	"Merrily We Roll Along" Page 9, #23	"Merrily We Roll Along"
4	do, re, mi, fa, sol, la	Bb, C, D, Eb, F, G	B flat Major	"Good King Wenceslas" Page 9, #26	"Good King Wenceslas"
5	do, re, mi, fa, sol, la	Bb, C, D, Eb, F, G	B flat Major	"Jolly Old St. Nicholas" Page 10, #32	"Jolly Old St. Nicholas"
6	do, re, mi, fa, sol, la	Bb, C, D, Eb, F, G	B flat Major	"Sweetly Sings the Donkey" Page 11, #37	"Sweetly Sings the Donkey"
7	do, re, mi, fa, sol, la	Bb, C, D, Eb, F, G	B flat Major	"Jingle Bells" Page 12, #41	"Jingle Bells"
8	do, re, mi, fa, sol, la	Bb, C, D, Eb, F, G	B flat Major	"Star Search - Twinkle, Twinkle Little Star" Page 15, #60	"Twinkle, Twinkle Little Star"
9	do, re, mi, fa, sol, la	Bb, C, D, Eb, F, G	B flat Major	Review all melodies	Review all melodies

Appendix Q: Sample Lessons from the Flute Experimental Group

Researcher-Designed Materials



Source: The PowerPoint slides color theme for this method book design was a free resource found online. "Free Templates for Teachers- Page 7 of 17," SlidesMania, accessed May 31, 2023, https://slidesmania.com/free-templates/education/page/7/.

Table of Contents

SECTION"	CONTENTS
Resources	Resources
Week 1	"Hot Cross Buns" Do, Re, Mi
Week 2	"Au Claire De La Lune"/"Little Friend Pierrot" Do, Re, Mi
Week 3	"Merrily We Roll Along"/ "Mary Had a Little Lamb" Do, Re, Mi, Sol
Week 4	"Good King Wenceslas" Do, Re, Mi, Fa, Sol
Week 5	"Jolly Old St. Nicholas" Do, Re, Mi, Fa, Sol, La Notation introduced this week
Week 6	"Sweetly Sings the Donkey" Do, Re, MI, Fa, Sol, Ti
Week 7	"Jingle Bells" Do, Re, Mi, Fa, Sol, La
Week 8	"Twinkle, Twinkle Little Star" Do, Re, Mi, Fa, Sol, La
Week 9	Review

Resources

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Flute Assembly, First Sounds, & Care

Videos offer a more straightforward method for illustrating the process of assembling, holding, and producing initial sounds.

To begin your learning journey, please click on the links below!

Watch the YouTube Instructional Videos:

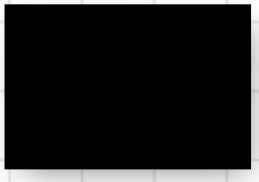
- How to assemble the flute:
  - Go to https://www.youtube.com/watch?v=w9TQS1Ejedo&list=PL06seol1EtFfz40s-AKHp90eg-unAeQbf
- How to make your first sounds:
  - Go to https://www.youtube.com/watch?v=AhO4viOGGTw&list=PL06seol1EtFfz40s-AKHp90eg-unAeQbf&index=3
- How to hold the flute:
  - Go to https://www.youtube.com/watch?v=SLO0WkLXwfo&list=PL06seol1EtFfz40s-AKHp90eg-unAeQbf&index=5
- How to clean your flute:
  - Go to https://www.youtube.com/watch?v=7wJiDbcw3Zs

Flute Embouchure

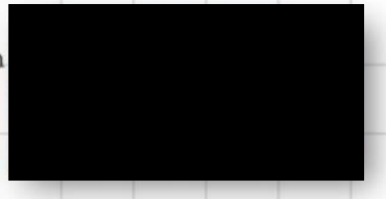
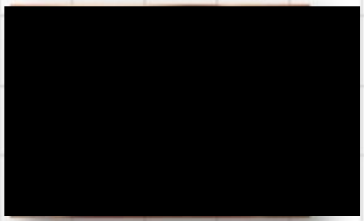
All information provided on this page was sourced from Band Directors Talk Shop and YouTube.

READ: For further details and visuals, visit https://banddirectorstalkshop.com/362/

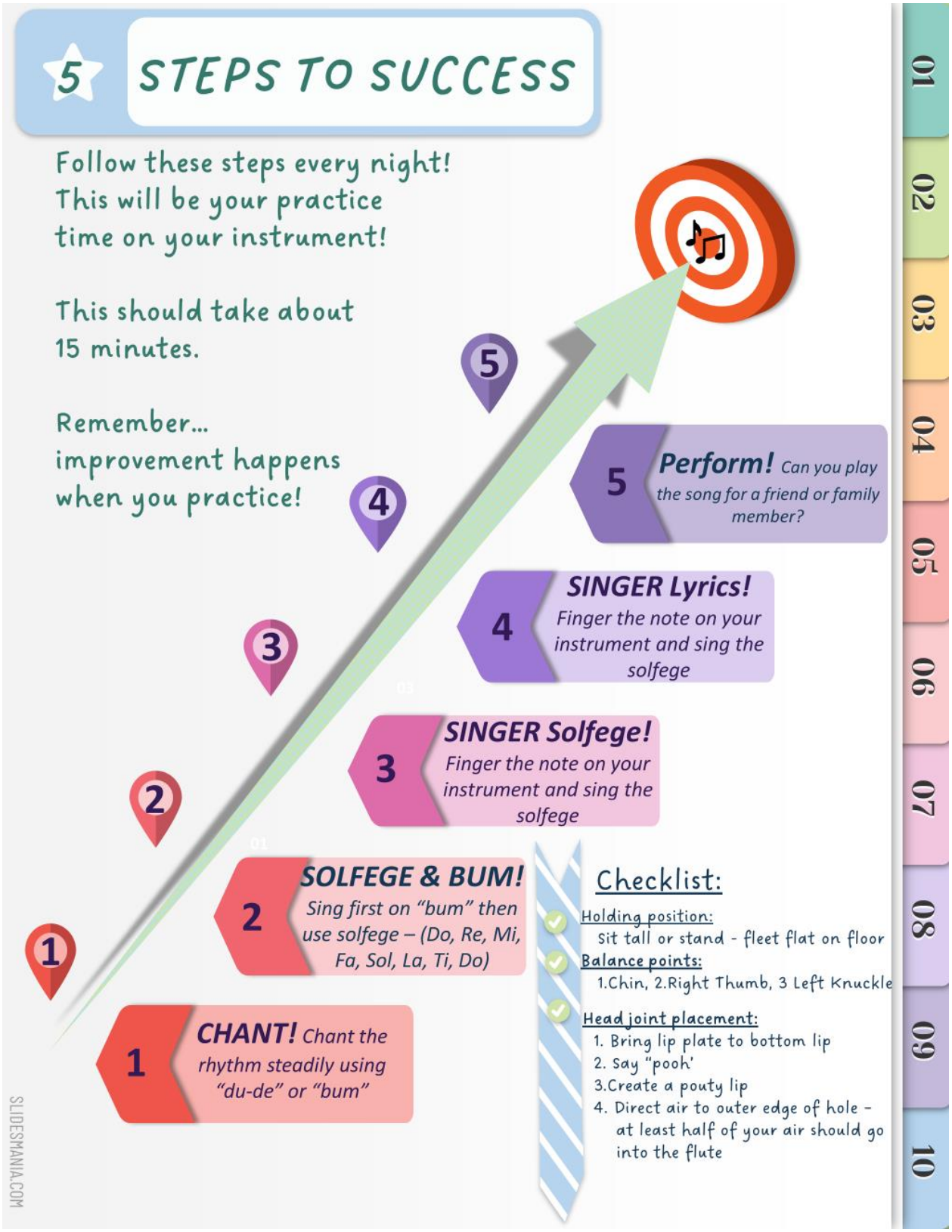
WATCH: Check out this YouTube video demonstrating how to create your first sounds: https://www.youtube.com/watch?v=AhO4viOGGTw&list=PL06seol1EtFfz40s-AKHp90eg-unAeQbf&index=3



Flute Embouchure- Have a mirror handy

1. Hold your flute head joint and position it against your bottom lip, ensuring it's parallel to the floor.
2. Align your lip so that the pink part of your bottom

open hole.
3. Say "pooh" and blow air through the head joint.
4. Keep your bottom lip relaxed while directing at least half of the air into the hole.
5. Make a pouty face – tell your mom your band teacher said it is okay to pout when playing the flute! 😊

6. Check your aperture (the opening in your lips)
   - It should form a small oval, not a circle!

The three images and directions were taken from https://banddirectorstalkshop.com/362/


5 STEPS TO SUCCESS
Follow these steps every night! This will be your practice time on your instrument!
This should take about 15 minutes.
Remember... improvement happens when you practice!
5 Perform! Can you play the song for a friend or family member?
4 SINGER Lyrics! Finger the note on your instrument and sing the solfege
3 SINGER Solfege! Finger the note on your instrument and sing the solfege
2 SOLFEGE & BUM! Sing first on "bum" then use solfege – (Do, Re, Mi, Fa, Sol, La, Ti, Do)
1 CHANT! Chant the rhythm steadily using "du-de" or "bum"
Checklist:
Holding position:
Sit tall or stand - fleet flat on floor
Balance points:
1.Chin, 2.Right Thumb, 3 Left Knuckle
Head joint placement:
1. Bring lip plate to bottom lip
2. Say "pooh'
3.Create a pouty lip
4. Direct air to outer edge of hole – at least half of your air should go into the flute
01
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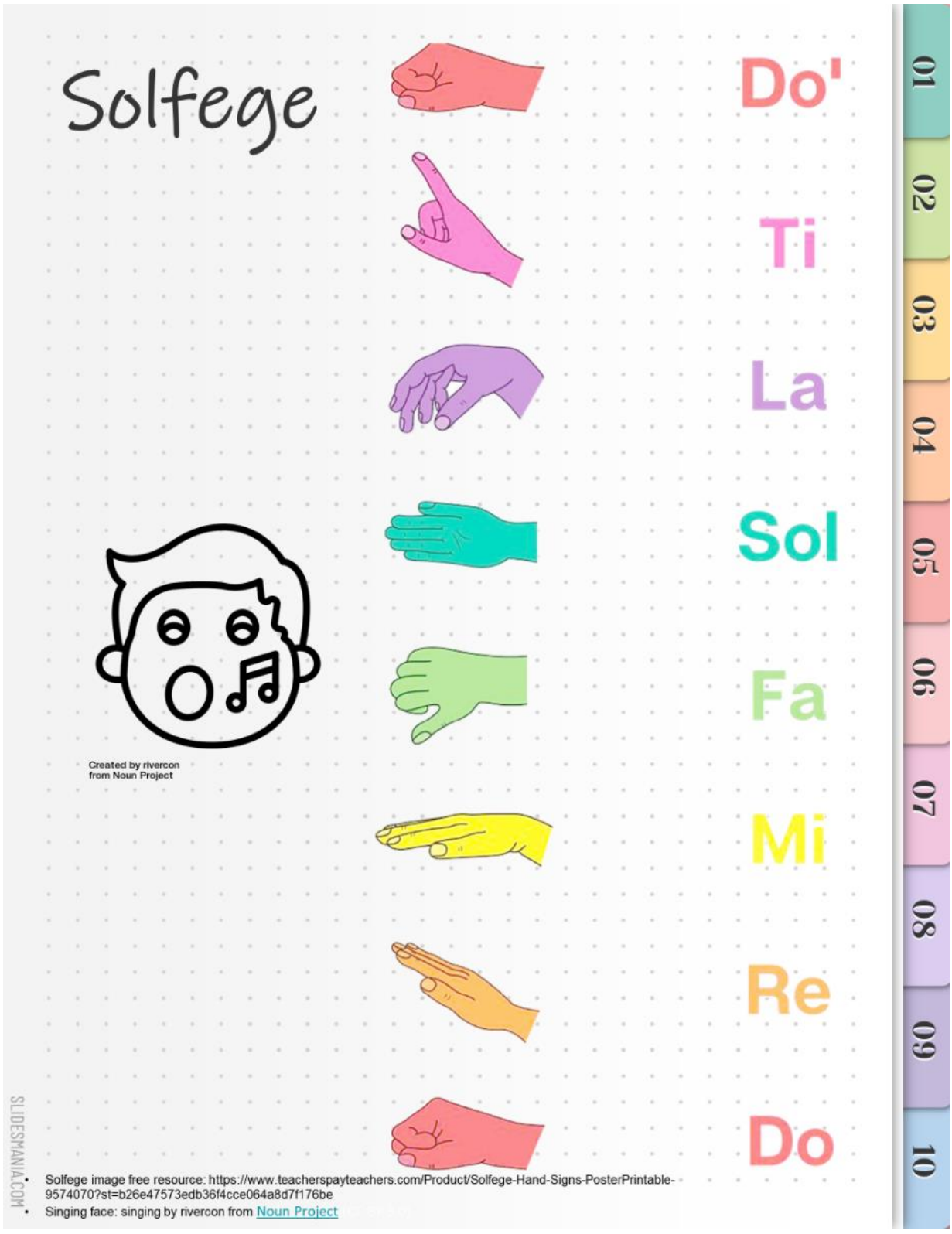
First Five Notes
Flute Fingerings
Weeks 1-4

Solfege	Note Name	Note	Fingering
Sol			
Fa			
Mi			
Re			
Do			

We will learn the note names
And notes on the Music staff later!

Stay tuned!


Solfege
Do'
Ti
La
Sol
Fa
Mi
Re
Do
Created by rivercon
from Noun Project
01
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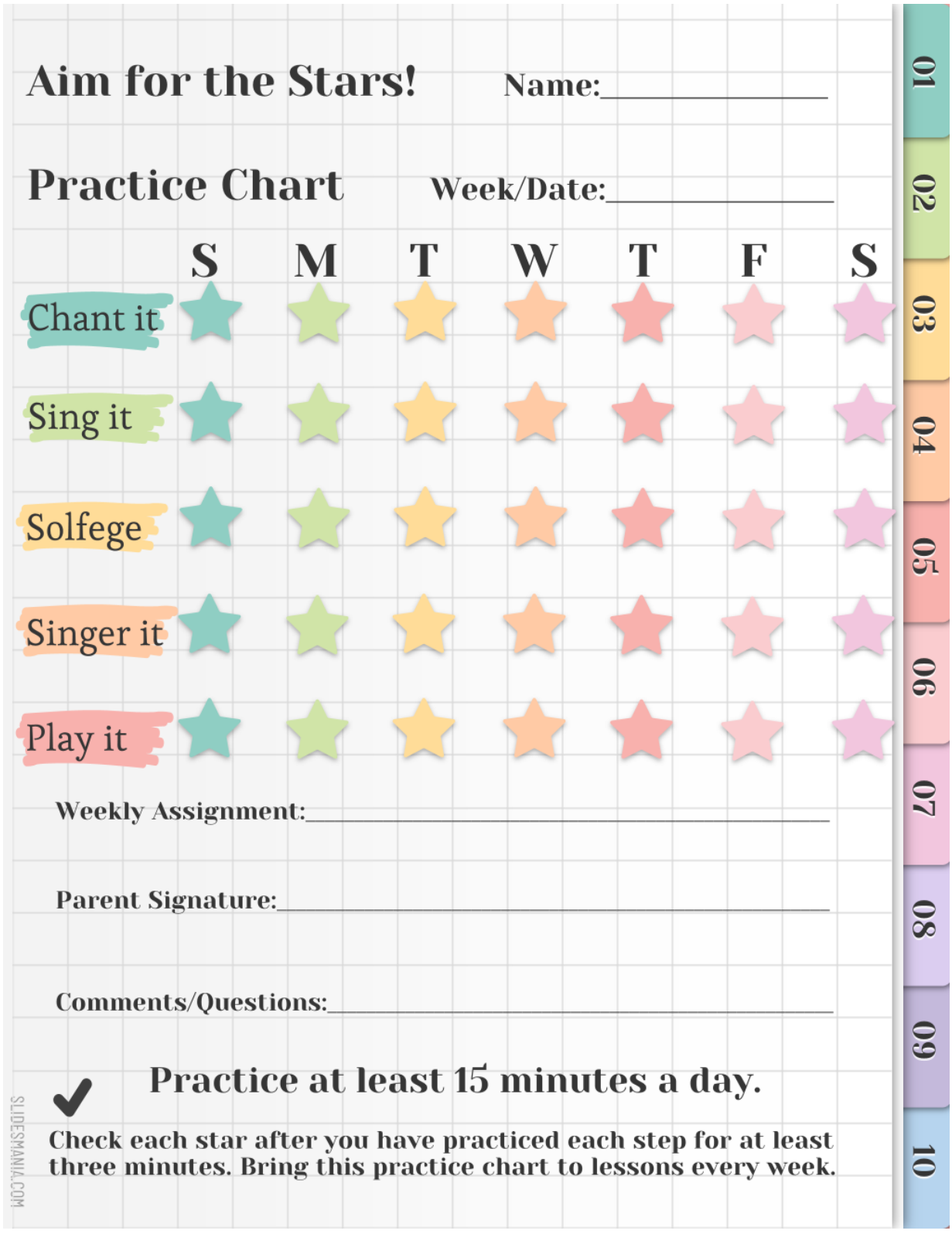
SLIDESMANIA.COM
Solfege image free resource: https://www.teacherspayteachers.com/Product/Solfege-Hand-Signs-PosterPrintable-9574070?st=b26e47573edb36f4cce064a8d7f176be
Singing face: singing by rivercon from Noun Project


Aim for the Stars!
Name:
Practice Chart
Week/Date:
S M T W T F S
Chant it
Sing it
Solfege
Singer it
Play it
Weekly Assignment:
Parent Signature:
Comments/Questions:
Practice at least 15 minutes a day.
Check each star after you have practiced each step for at least three minutes. Bring this practice chart to lessons every week.
SLIDESMANIA.COM
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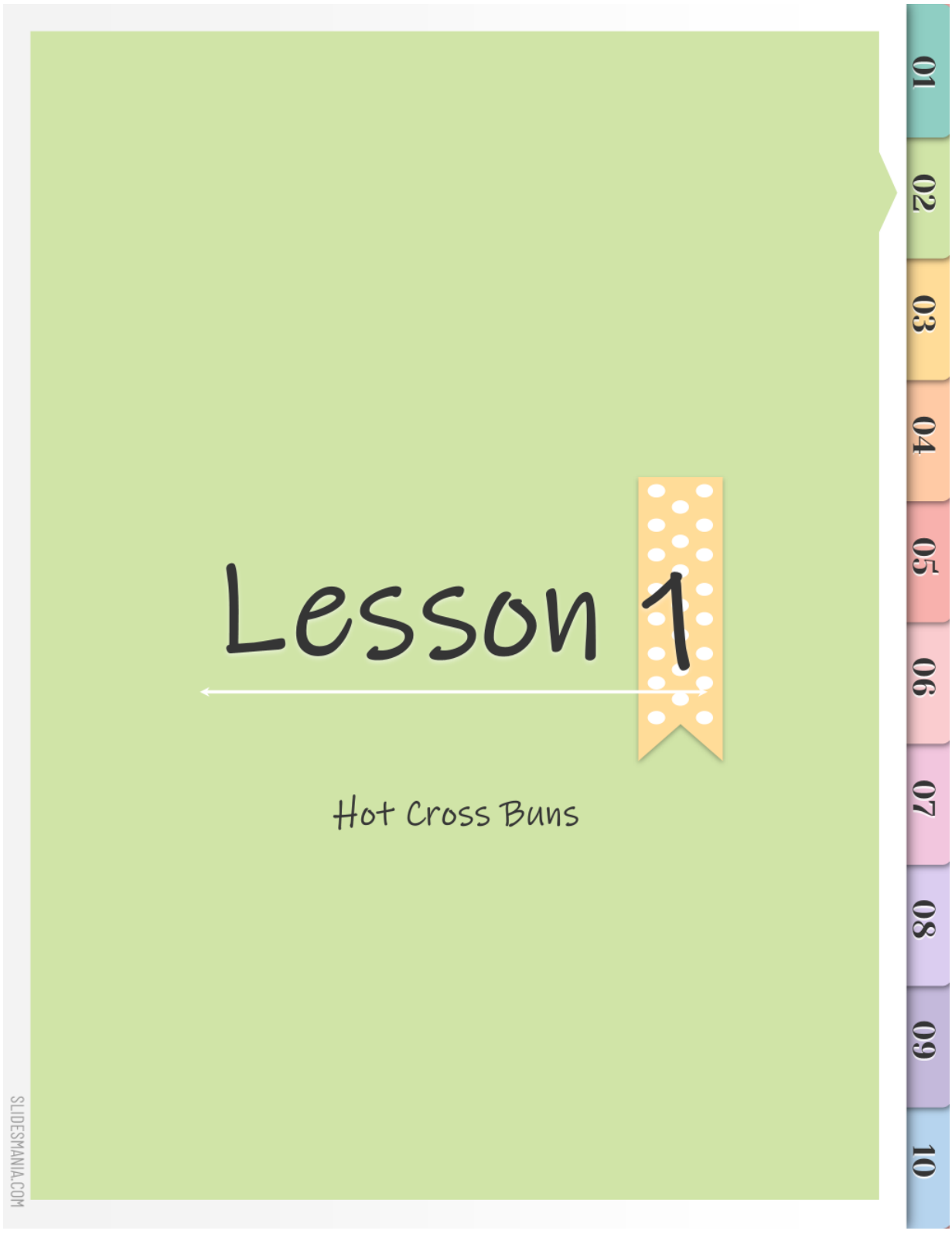
Lesson 1
Hot Cross Buns
01
02
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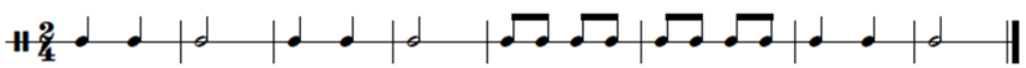
Lesson 1

Chanting Rhythms "Hot Cross Buns"

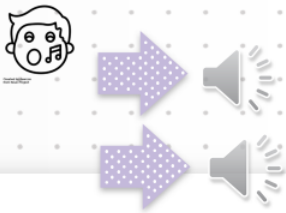
- Warm-up time!
- Listen to the rhythm chant of Hot Cross Buns using "Bum"
- Watch the rhythm below as you listen
- Your turn – Listen and echo

Hot Cross Buns

Rhythm Reading

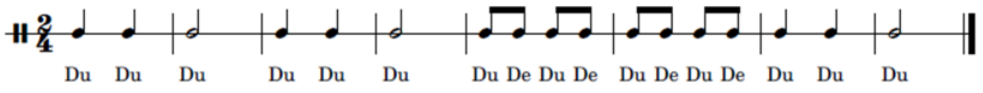


- Listen to your teacher demonstrate using "Du" and "De"
- Your turn to echo your teacher



Hot Cross Buns

Rhythm Reading



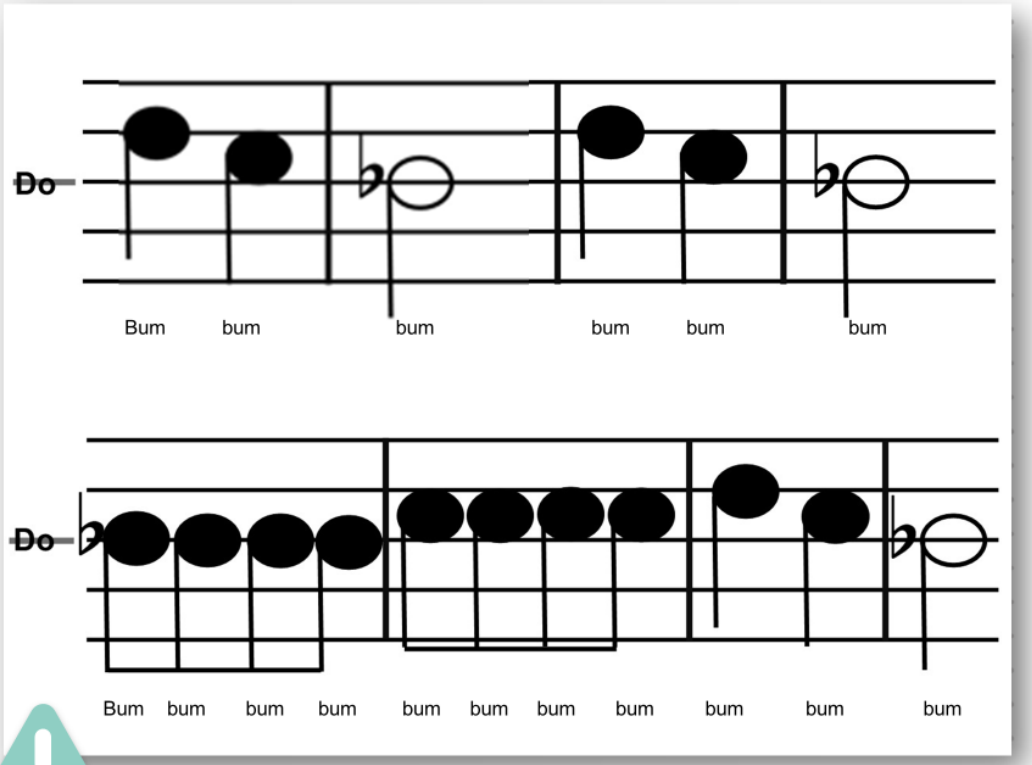
SOLO CHALLENGE: Can you chant "Du" and "De" without any help while keeping the macro beat steady?

Singing face: singing by rivercon from Noun Project

Lesson 1

Sing using "Bum" "Hot Cross Buns"

- Singing the melody using "bum"
  - Listen to your teacher sing the melody on "bum"
  - Echo sing phrases with your teacher
  - Sing the whole melody with your teacher on "bum"
  - Sing the melody on your own!



CHALLENGE: As you listen to the teacher, can you hear the sounds to the melody inside your head?

Lesson 1

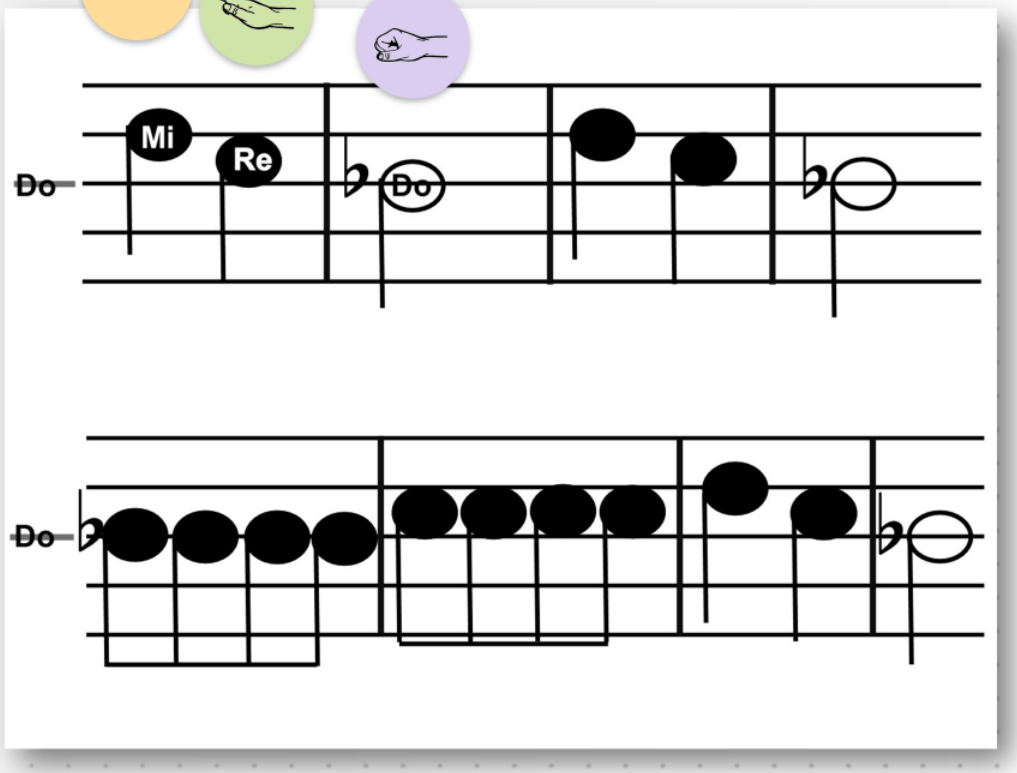
Solfege Singing "Hot Cross Buns"

- Sing Song Using Solfege
  - Listen to Mi Re Do
  - Echo sing Mi Re Do
    - Listen to recording
  - Sing on your own!
    - Click on the star to hear the correct pitches.
    - Don't forget to breathe!


Mi


Re


Do



CHALLENGE: Touch the notes as you sing, or use the hand signs as you sing!

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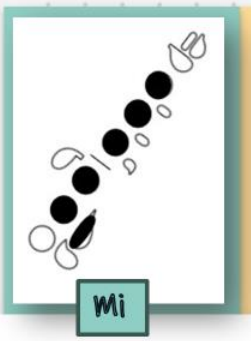
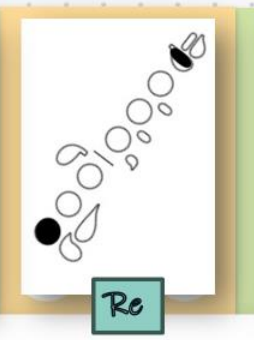
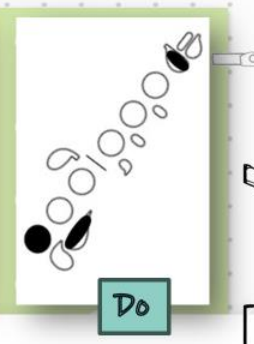
Lesson 1

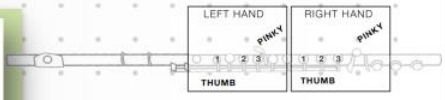
"Singer" solfege
Hot Cross Buns

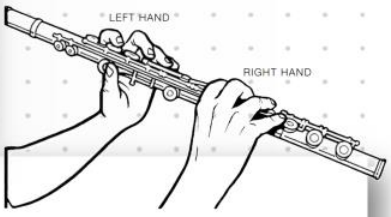
"SINGER" Mi Re Do (Finger the notes as you sing)

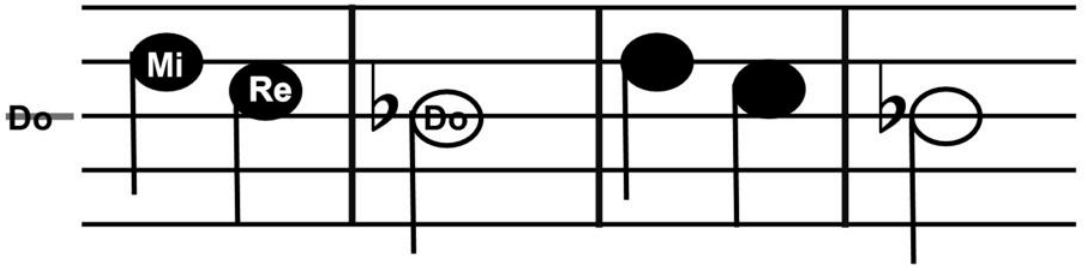


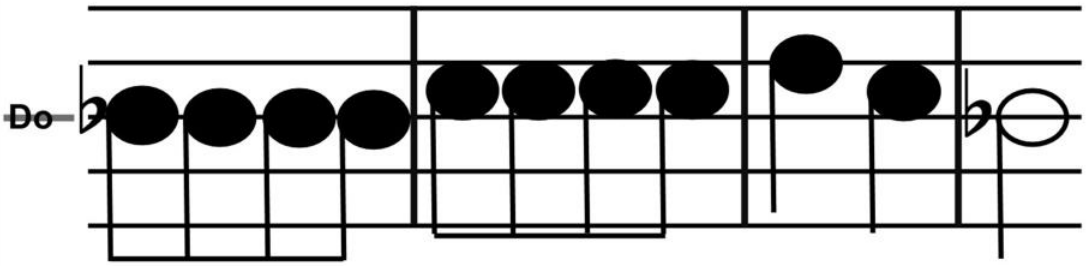












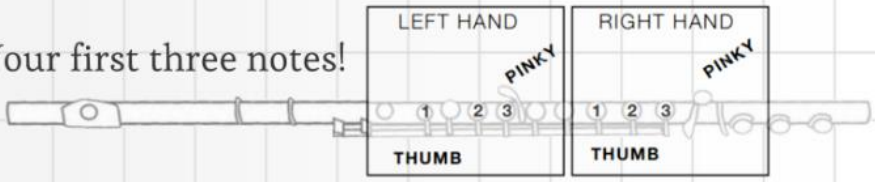
CHALLENGE: Watch yourself in a mirror when you "Singer"

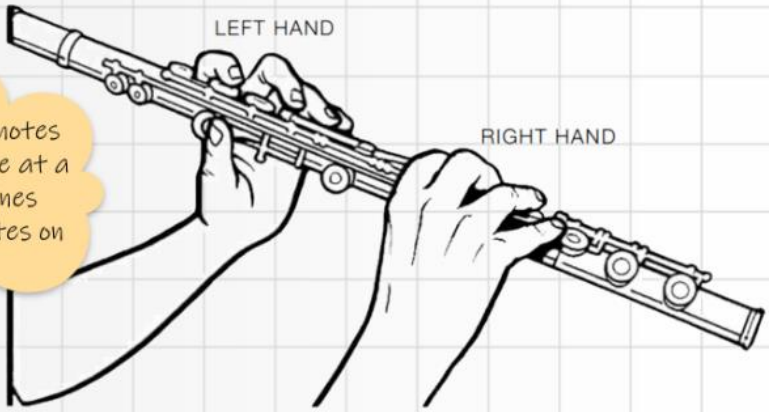
Are you holding the flute properly?

- Are your lips saying "pooh," and are they "pouty?"
- Rewatch the videos from the resource page if you are struggling.

How to Finger "Mi Re Do"

Your first three notes!





Steps

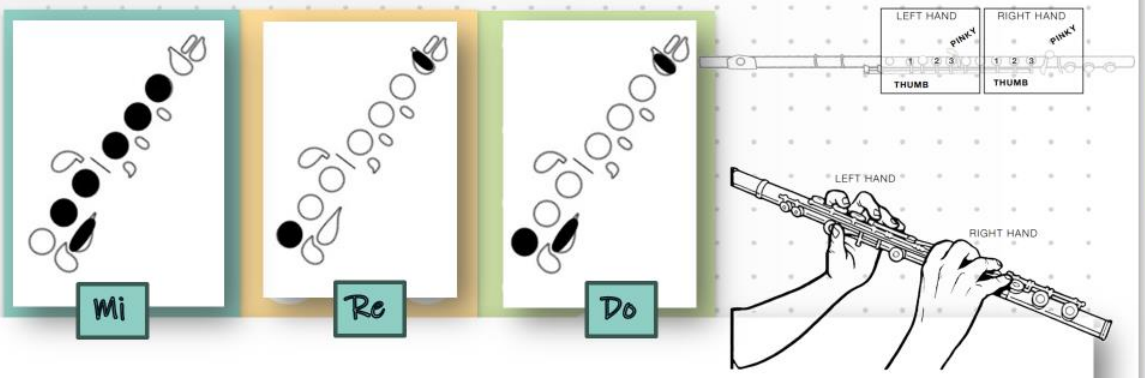
1. Only finger notes
2. Play one note at a time-long tones
3. " Singer" notes on solfege

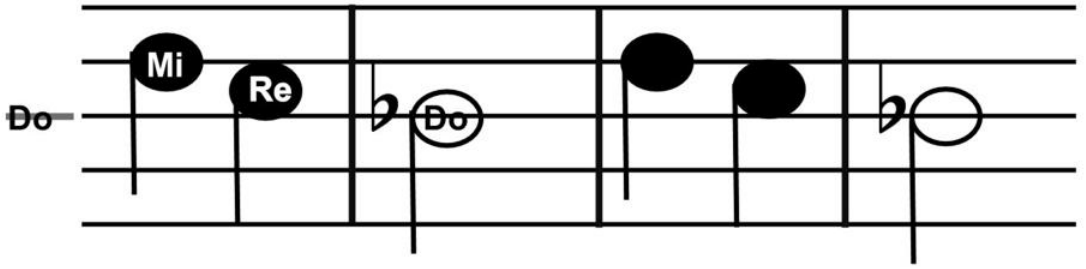
Mi Re Do

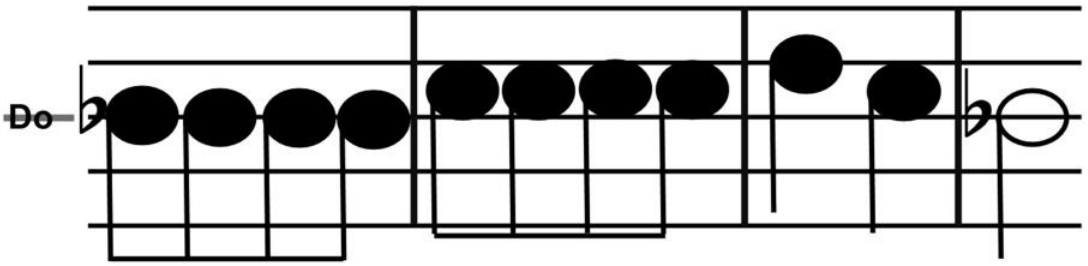
Lesson 1

"Singer" solfege
Hot Cross Buns

"SINGER" Mi Re Do (Finger the notes as you sing)







CHALLENGE: Watch yourself in a mirror when you "Singer"

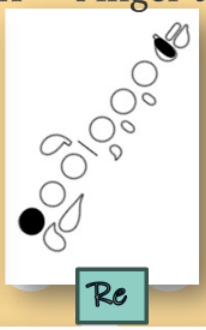
Are you holding the flute properly?

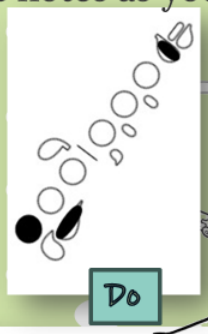
- Are your lips saying "pooh," and are they "pouty?"
- Rewatch the videos from the resource page if you are struggling.

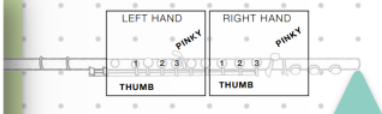
Lesson 1

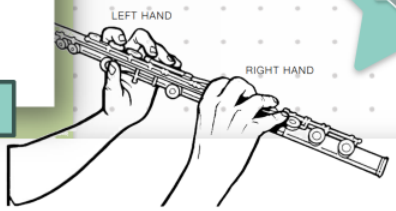
"Singer" lyrics
Hot Cross Buns

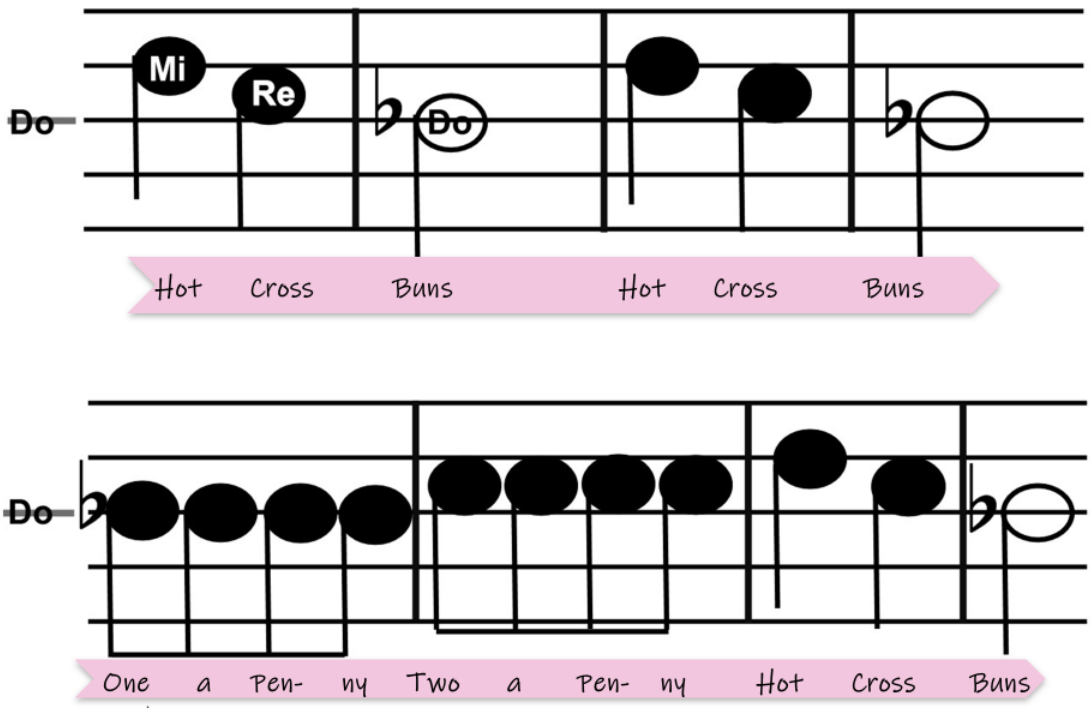
- "SINGER" = Finger the notes as you sing the song!











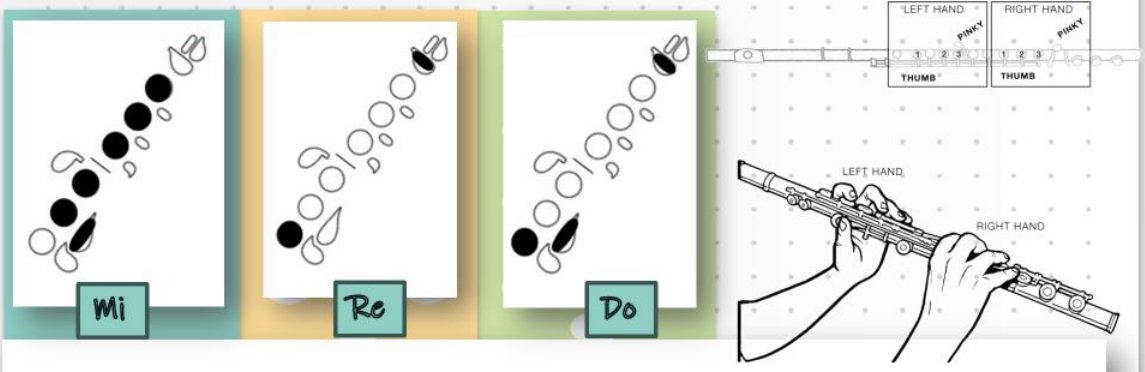
CHALLENGE: "SINGER" the song three different ways!

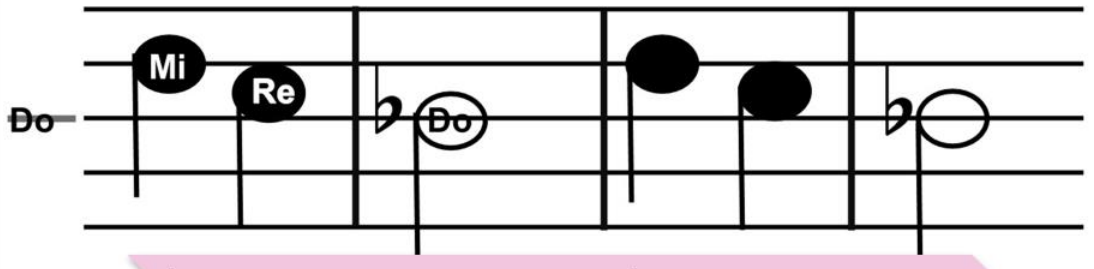
- 1st time – solfege, 2nd time – Note names, 3rd time – Words!

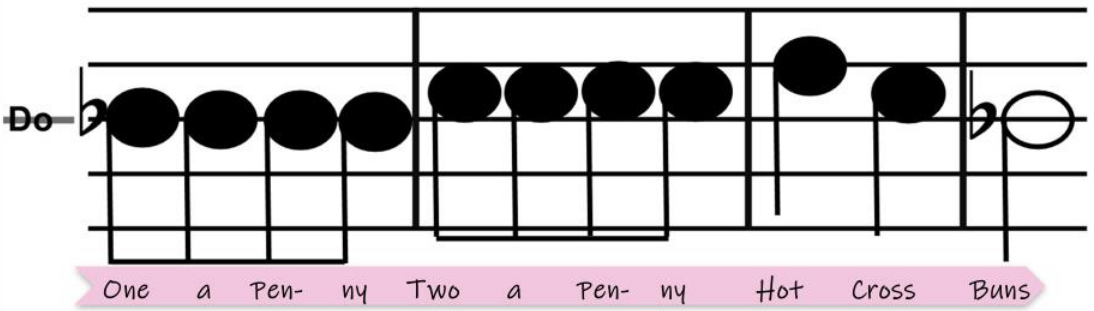
Lesson 1

Perform Hot Cross Buns

- Time to play the song! Try to SING the song in your head as you play!



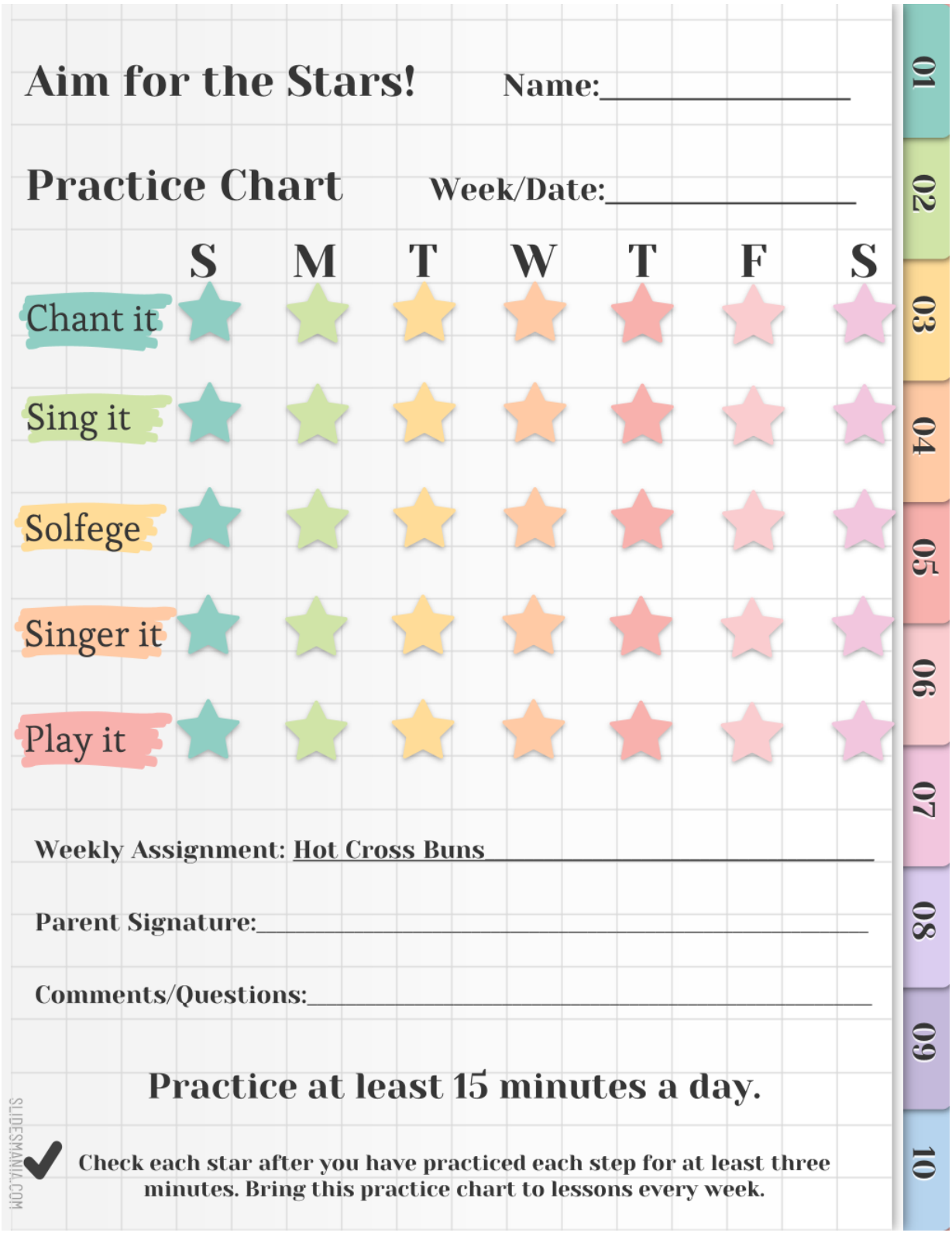




CHALLENGE: Play for a family member or record yourself with your Smartphone! Then, listen to it and reflect on how you can improve!

Notes:

- Practice this song every night using the 5 Step process.
- Remember to record your practice on the chart below


Aim for the Stars!
Name:_____
Practice Chart
Week/Date:_____
S M T W T F S
Chant it
Sing it
Solfege
Singer it
Play it
Weekly Assignment: Hot Cross Buns
Parent Signature:_____
Comments/Questions:_____
Practice at least 15 minutes a day.
Check each star after you have practiced each step for at least three minutes. Bring this practice chart to lessons every week.
SLIDESMANIA.COM
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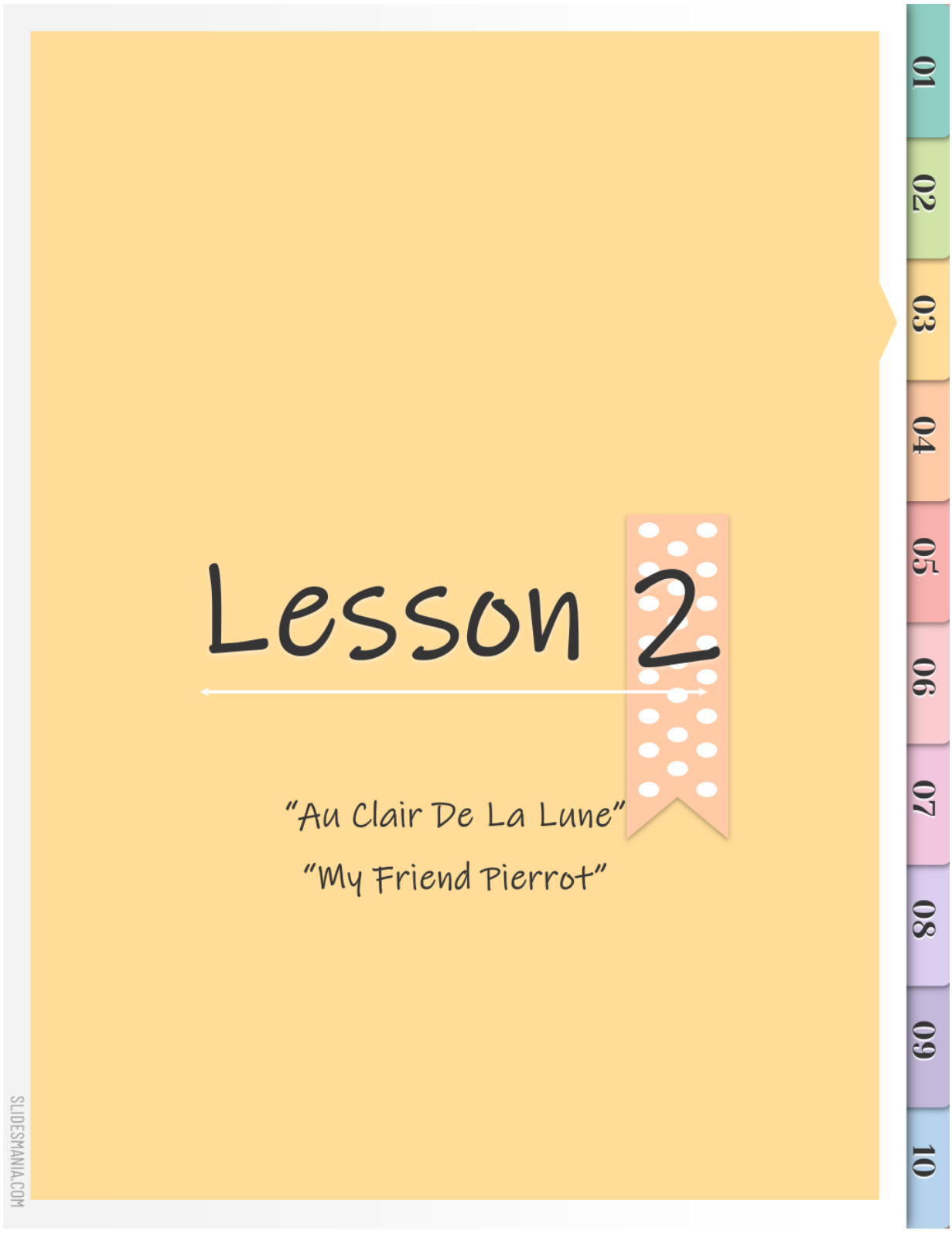
Lesson 2
"Au Clair De La Lune"
"My Friend Pierrot"
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Lesson 2

Chanting Rhythms "Au Claire De La Lune"

- Listen to the rhythm chant of Au Claire De La Lune on "Bum"
- Watch the rhythm below as you listen
- Your turn – Listen and echo

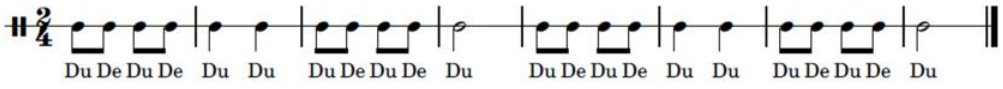
Au Claire De La Lune in 2/4

Rhythm Reading

- Listen to your teacher demonstrate using "Du" and "De"
- Your turn to echo your teacher

Au Claire De La Lune in 2/4

Rhythm Reading



SOLO CHALLENGE: Can you chant "Du" and "De" without any help while keeping the macro beat steady?

Singing face: singing by rivercon from Noun Project

Lesson 2

Solfege Singing "Au Claire De La Lune"


Mi


Re


Do

- Sing Song Using Solfege
  - Listen to your teacher sing: Do Re Mi
  - Echo sing Do Re Mi
  - Listen to your sing Au Claire De La Lune on solfege
  - Echo sing with your teacher
  - Sing on your own!

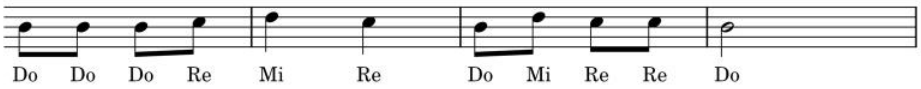


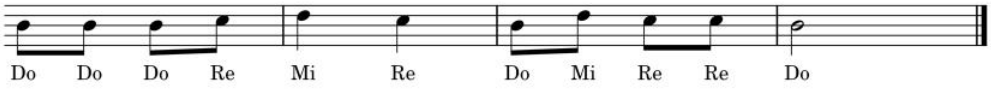



Flute

Au Claire De La Lune

Traditional

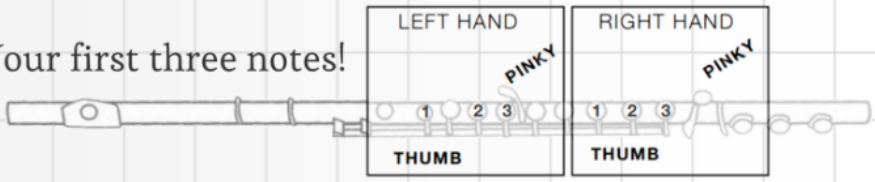


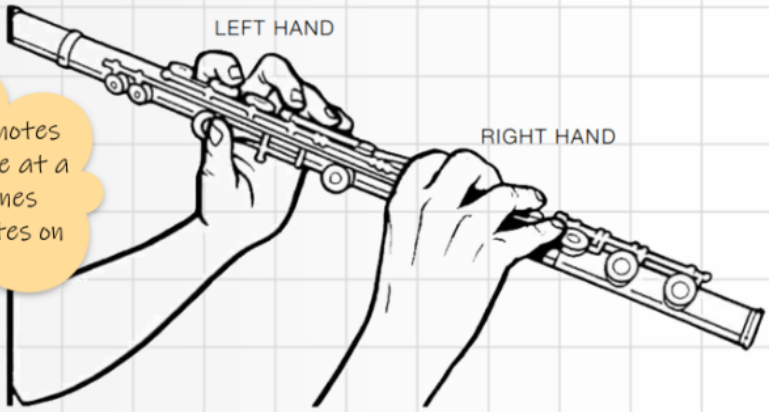


CHALLENGE: Use the hand signs as you sing! If that is too difficult, touch the notes as you sing!

How to Finger "Do Re Mi"

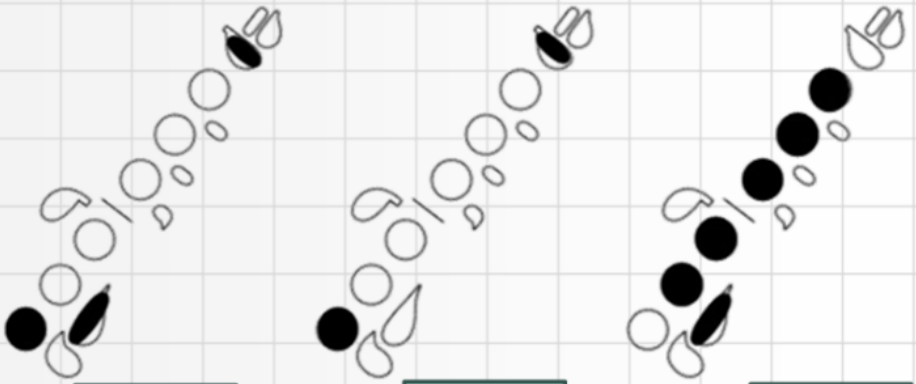
Your first three notes!





Steps

1. Only finger notes
2. Play one note at a time-long tones
3. " Singer" notes on solfege

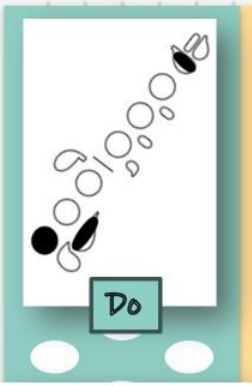


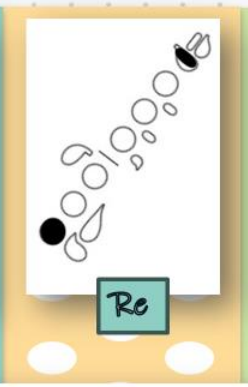
Do Re Mi

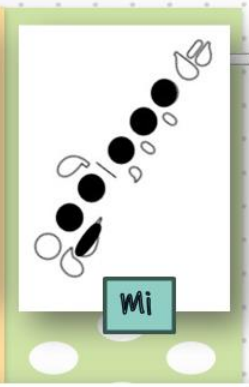
Lesson 2

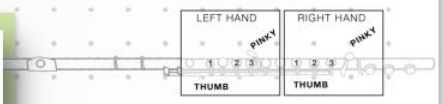
"Singer" solfege
Au Claire De La Lune

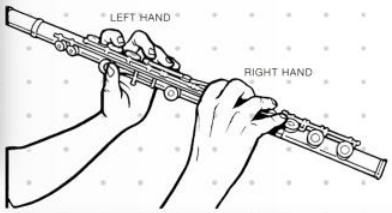
"SINGER" Do Re Mi (Finger the notes as you sing)







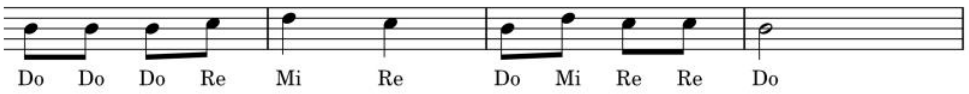


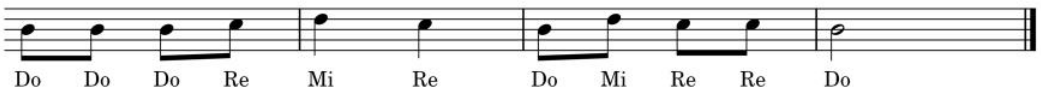


Flute

Au Claire De La Lune

Traditional





CHALLENGE: Watch yourself in a mirror when you "Singer"

Are you holding the flute properly?

- Are your fingers on the correct keys?

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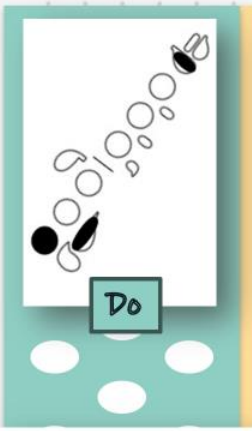
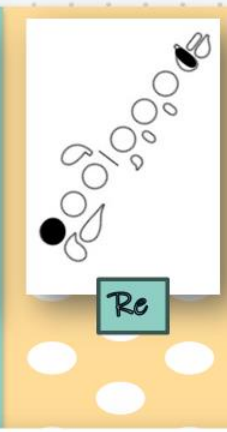
01 02 03 04 05 06 07 08 09 10

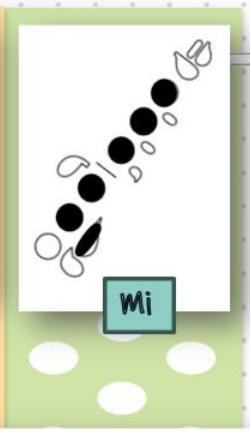
Lesson 2

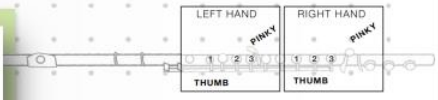
"Singer" lyrics
Au Claire De La Lune

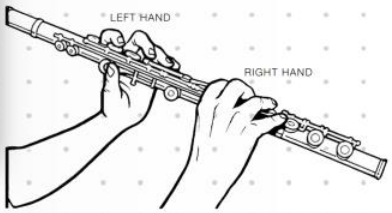
"SINGER" = Finger the notes as you sing the song!







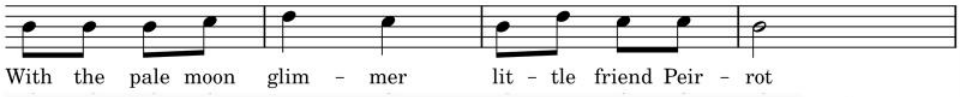




Flute

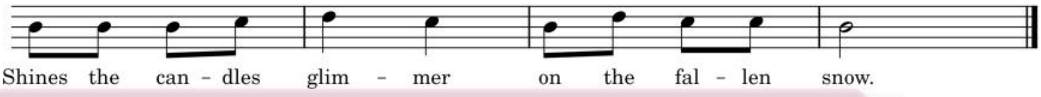
Au Claire De La Lune

Traditional



With the pale moon glim - mer lit - tle friend Peir - rot

Do Do Do Re Mi Re Do Mi Re Re Do



Shines the can - dles glim - mer on the fal - len snow.

Do Do Do Re Mi Re Do Mi Re Re Do

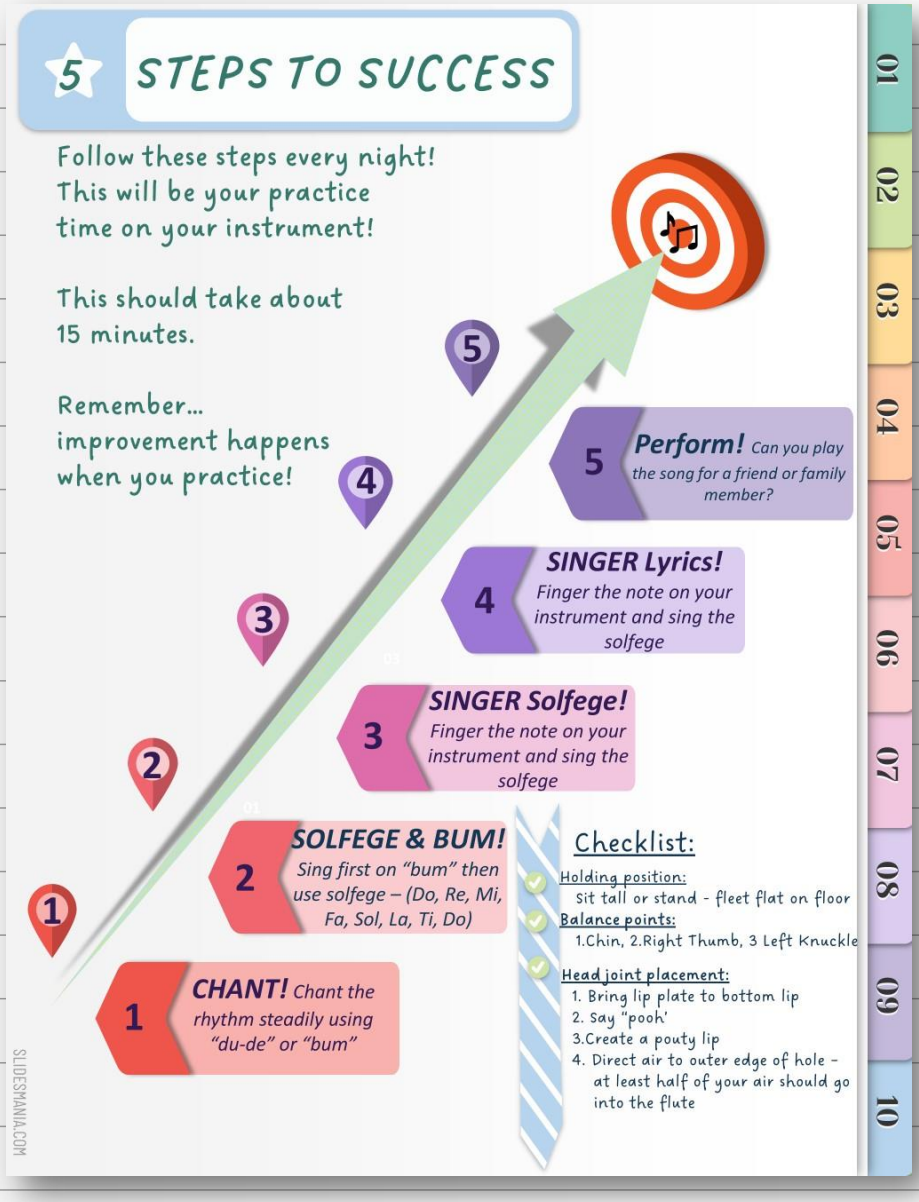
CHALLENGE: Watch yourself in a mirror when you "Singer"

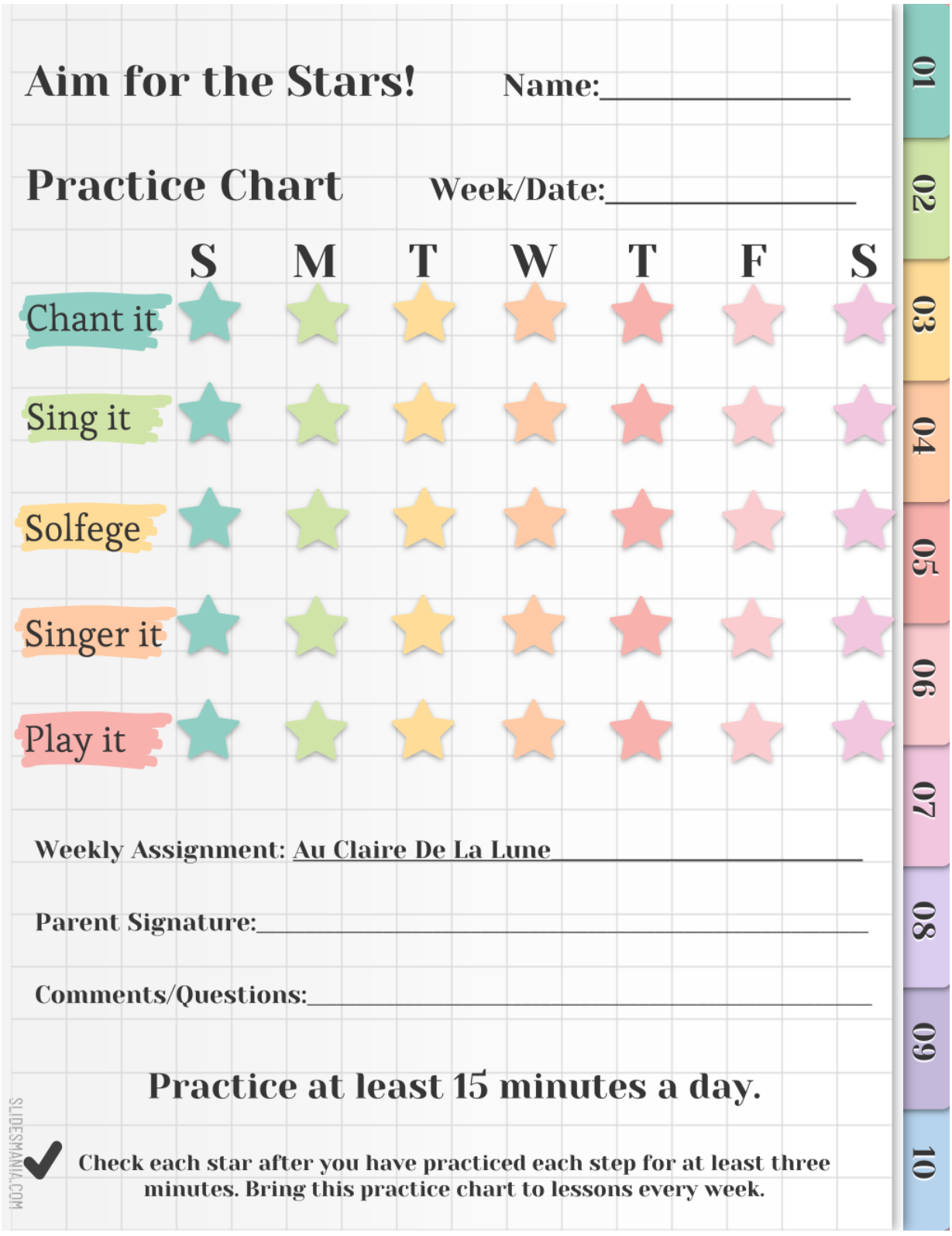
Are you holding the flute properly?

- Are your fingers on the correct keys?

Notes:

- Practice this song every night using the 5 Step process.
- Remember to record your practice on the chart below




Aim for the Stars!
Name:_____
Practice Chart
Week/Date:_____
S M T W T F S
Chant it
Sing it
Solfege
Singer it
Play it
Weekly Assignment: Au Claire De La Lune
Parent Signature:_____
Comments/Questions:_____
Practice at least 15 minutes a day.
Check each star after you have practiced each step for at least three minutes. Bring this practice chart to lessons every week.
SLIDESMANIA.COM
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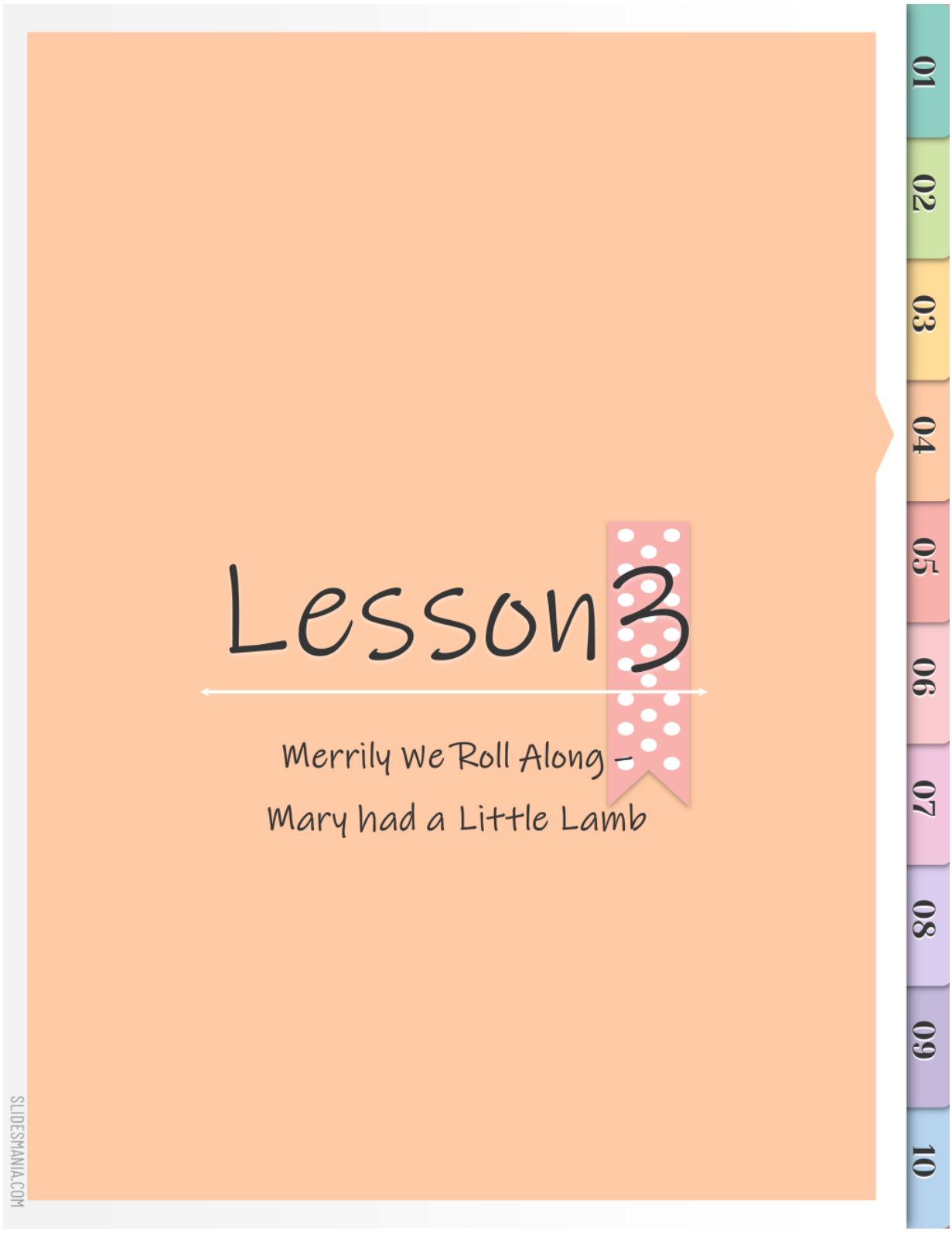
Lesson 3
Merrily We Roll Along –
Mary had a Little Lamb
01
02
03
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SLIDESMANIA.COM

Lesson 3

Rhythm Chants "Merrily We Roll Along"

- Listen to the rhythm chant of Hot Cross Buns using "Bum"
- Watch the rhythm below as you listen
- Your turn – Listen and echo

Merrily We Roll Along

Mary Had a Little Lamb

Traditional

- Listen to your teacher demonstrate using "Du" and "De"
- Your turn to echo your teacher

Merrily We Roll Along

Mary Had a Little Lamb

Traditional

SOLO CHALLENGE: Can you chant "Du" and "De" without any help while keeping the macro beat steady

Singing face: singing by rivercon from Noun Project

Lesson 3

Singing on Bum "Merrily We Roll Along"

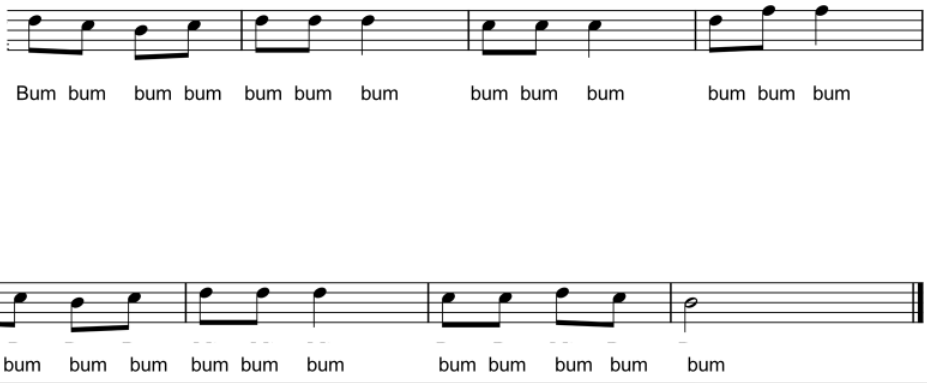
- Singing the melody using "bum"
  - Listen to your teacher sing the melody on "bum"
  - Echo sing phrases with your teacher
  - Sing the whole melody with your teacher on "bum"
  - Sing the melody on your own!

Flute

Merrily We Roll Along

Mary Had a Little Lamb

Traditional



CHALLENGE: As you listen to the teacher, can you hear the sounds to the melody inside your head?

Lesson 3

Solfege Singing "Merrily We Roll Along"

- Sing Song Using Solfege
  - Listen to your teacher sing: Do Re Mi Fa Sol
  - Echo sing Do Re Mi Fa Sol
  - Listen to your teacher sing
    - Au Claire De La Lune on solfege
  - Echo sing with your teacher
  - Sing on your own!


Sol


Fa


Mi


Re

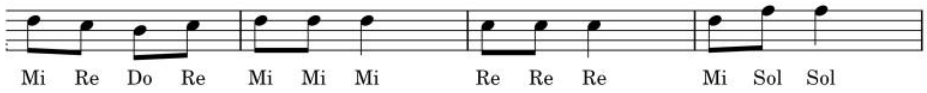

Do

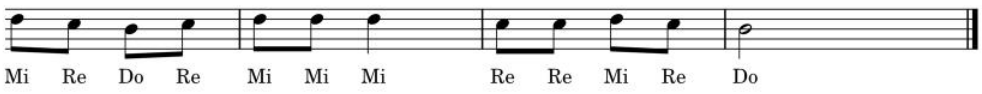
Flute

Merrily We Roll Along

Mary Had a Little Lamb

Traditional

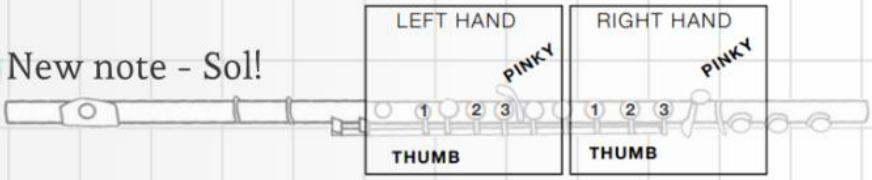


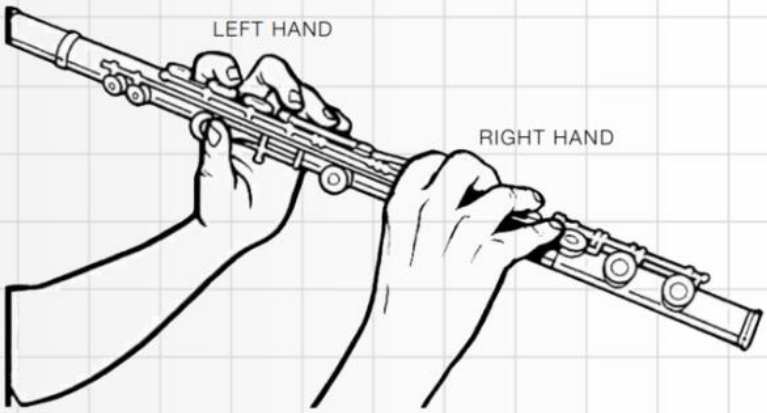


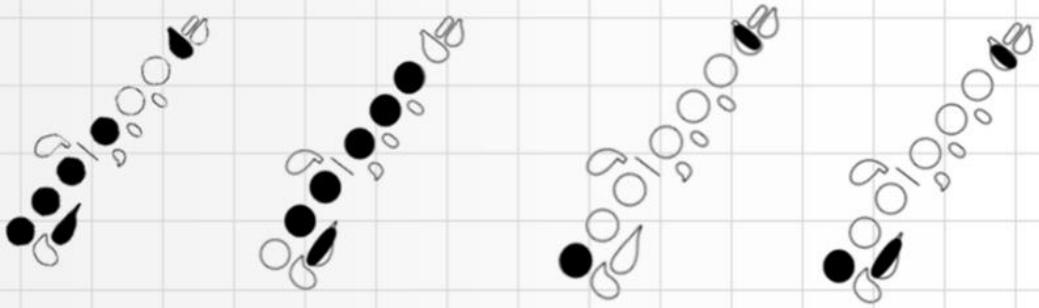
CHALLENGE: Use the hand signs as you sing! If that is too difficult, touch the notes as you sing!

How to Finger "Sol Mi Re Do"

New note - Sol!







SOL Mi Re Do

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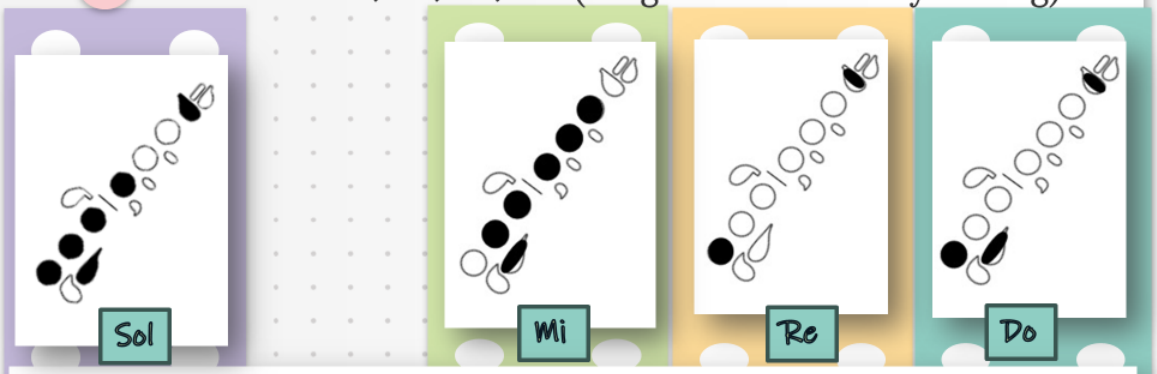
01 02 03 04 05 06 07 08 09 10

Lesson 3

"Singer" Solfege
Merrily We Roll Along

"SINGER" **Sol, Mi, Re, Do** (Finger the notes as you sing)

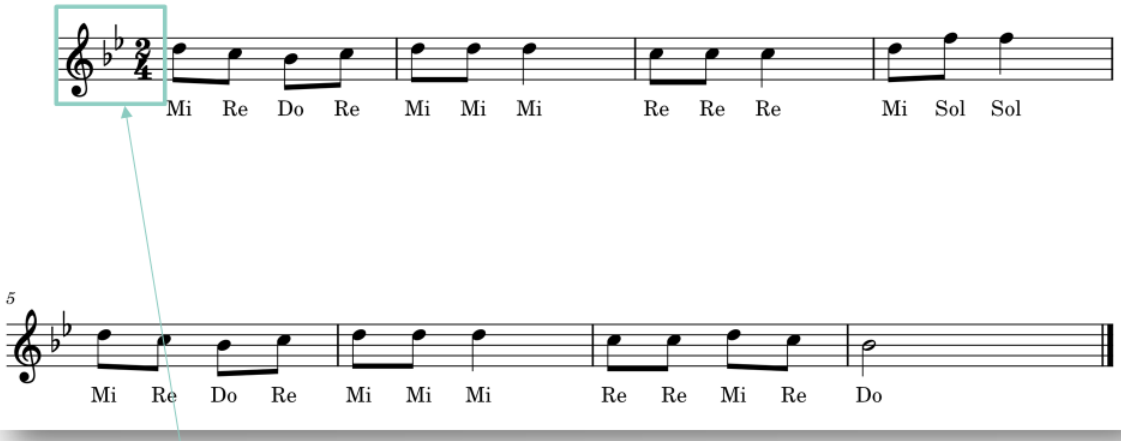


Flute

Merrily We Roll Along

Mary Had a Little Lamb

Traditional



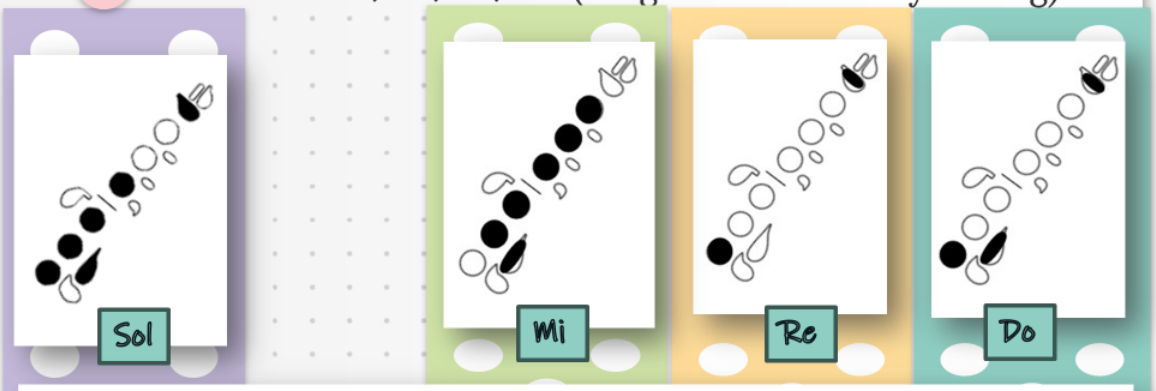
NOTICE: New symbols at the beginning of the music!

Music has many important symbols that help us learn to read!

Lesson 3

"Singer" Lyrics
Merrily We Roll Along

"SINGER" **Sol, Mi, Re, Do** (Finger the notes as you sing)

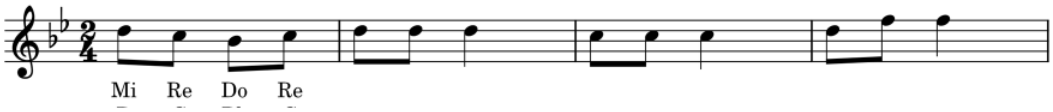


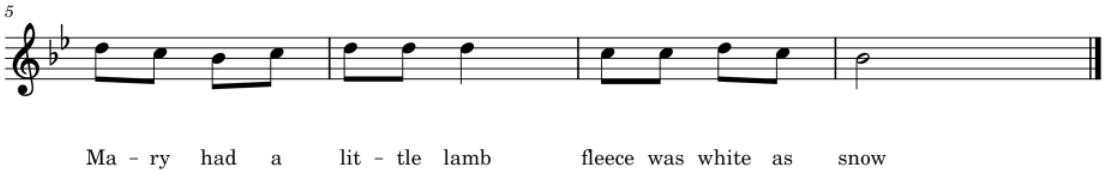
Flute

Merrily We Roll Along

Mary Had a Little Lamb

Traditional



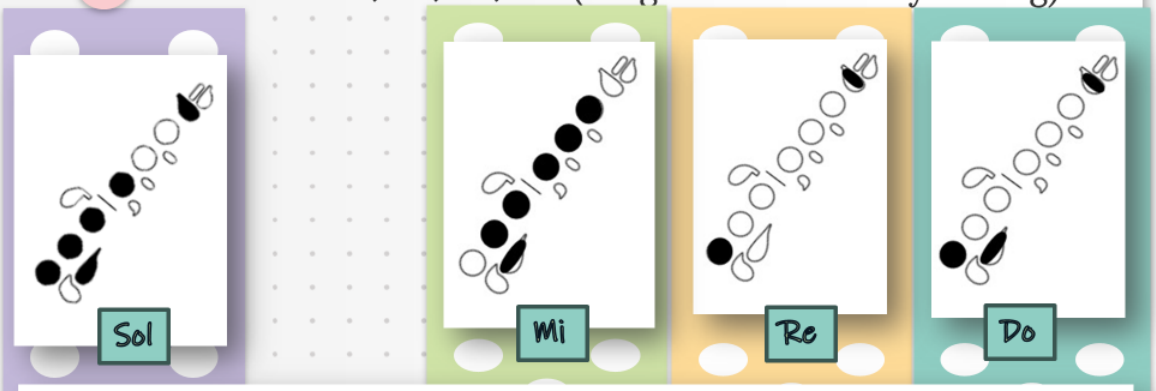


Challenge: Could you play this without music?

Lesson 3

Perform Merrily We Roll Along

"SINGER" **Sol, Mi, Re, Do** (Finger the notes as you sing)

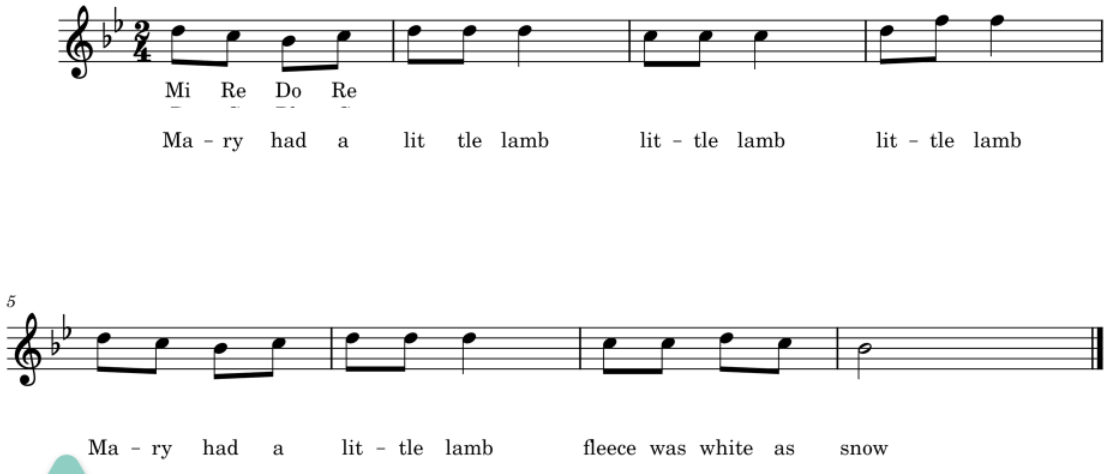


Flute

Merrily We Roll Along

Mary Had a Little Lamb

Traditional

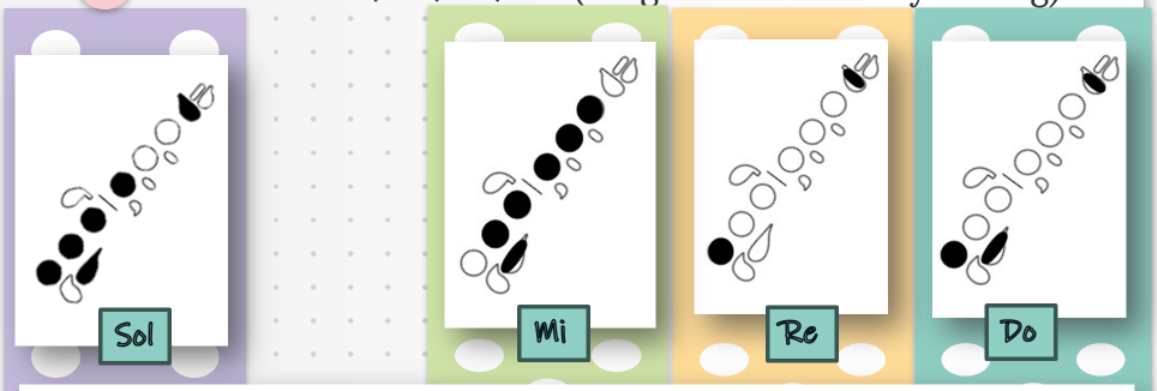


Challenge: Put on a concert for your family members or your pets! Record yourself!

Lesson 3

Perform Merrily We Roll Along

"SINGER" **Sol, Mi, Re, Do** (Finger the notes as you sing)

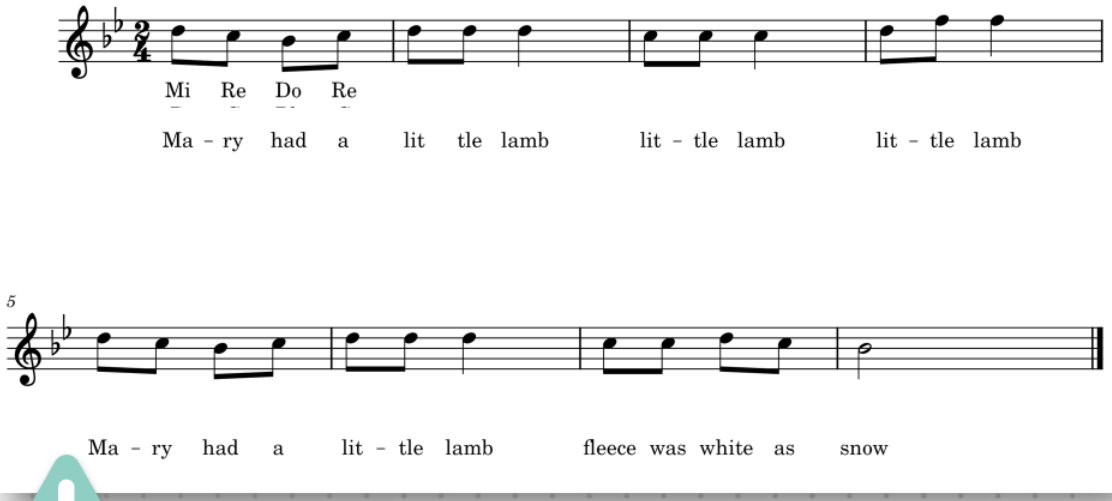


Flute

Merrily We Roll Along

Mary Had a Little Lamb

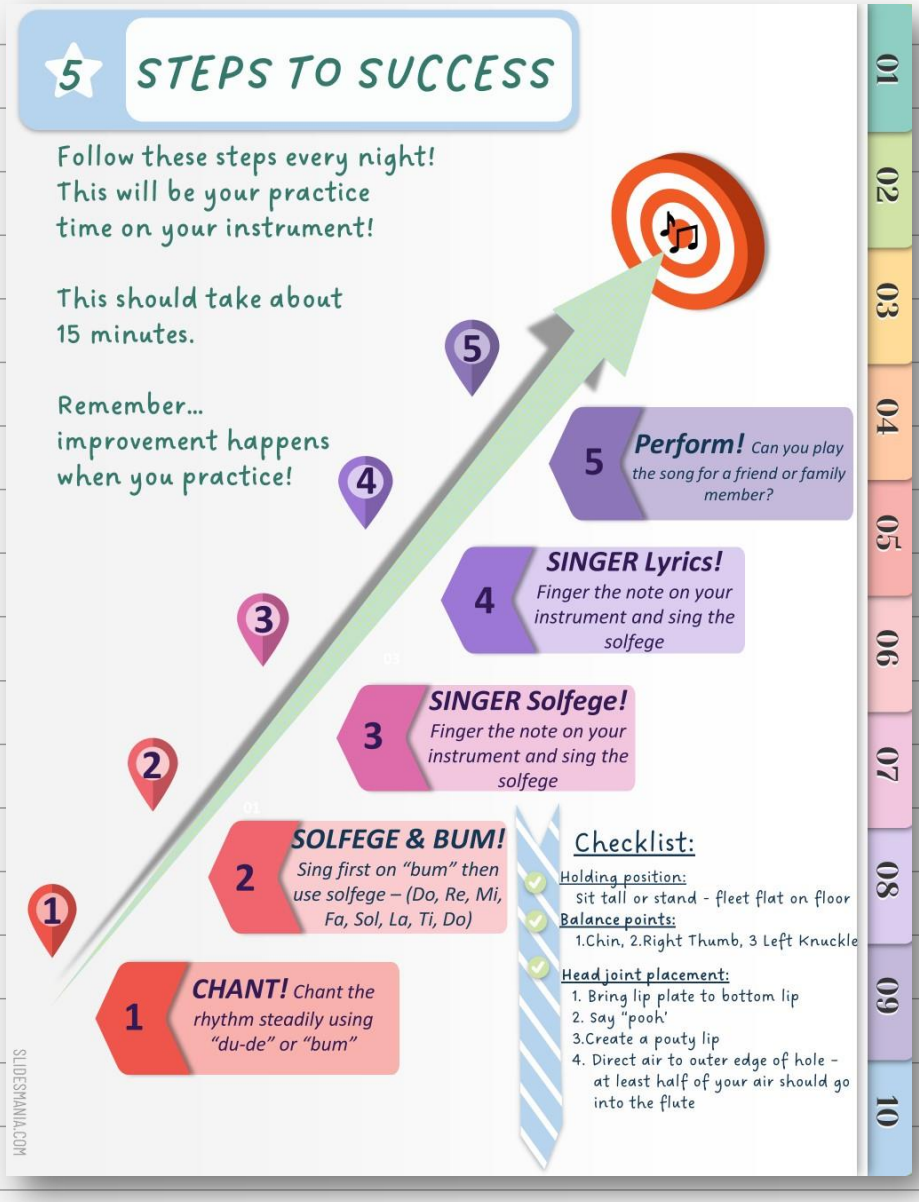
Traditional

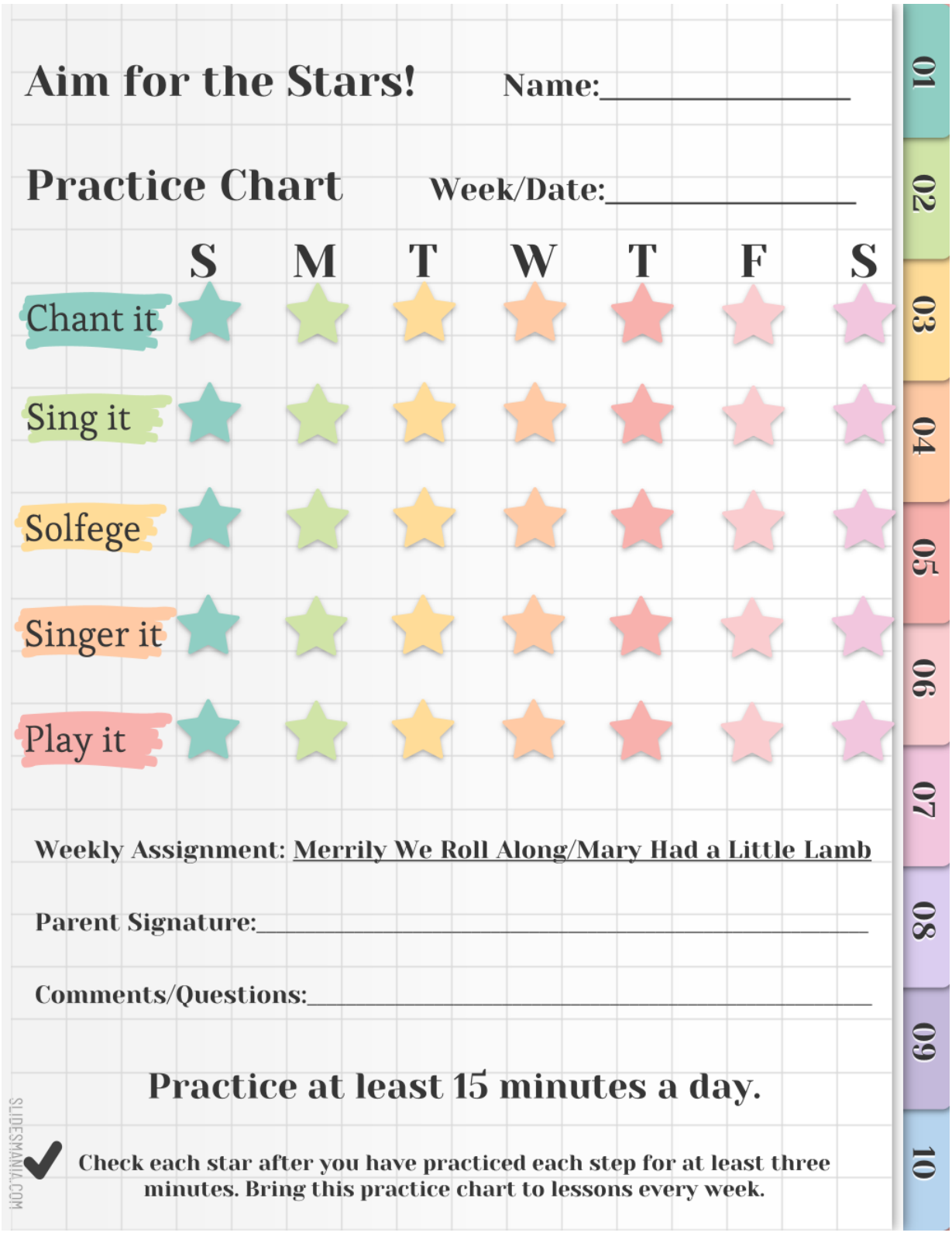


Challenge: Put on a concert for your family members or your pets! Record yourself!

Notes:

- Practice this song every night using the 5 Step process.
- Remember to record your practice on the chart below




Aim for the Stars!
Name:_____
Practice Chart
Week/Date:_____
S M T W T F S
Chant it
Sing it
Solfege
Singer it
Play it
Weekly Assignment: Merrily We Roll Along/Mary Had a Little Lamb
Parent Signature:_____
Comments/Questions:_____
Practice at least 15 minutes a day.
Check each star after you have practiced each step for at least three minutes. Bring this practice chart to lessons every week.
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Appendix R: Full Raw Data Set

	A	B	C	D	E	F	G	H	I	J	K	L
1	Participant	Group	Age	Boy/Girl	Grade	Instrument	ITML (T1) Pre	ITML (T1) Post	ITML (T2) Pre	ITML (T2) Post	IMMA Pre	IMMA Post
2	1	Experimental	9	Girl	4	Clarinet	16	17	18	20	37	38
3	2	Control	9	Boy	4	Trumpet	22	20	20	21	39	39
4	3	Control	10	Boy	5	Trumpet	13	14	15	13	30	28
5	4	Experimental	9	Boy	4	Clarinet	13	15	12	17	36	34
6	5	Control	10	Girl	5	Clarinet	15	13	15	16	34	33
7	6	Experimental	11	Boy	5	Trombone	20	22	19	19	34	38
8	7	Experimental	9	Boy	4	Trombone	11	19	17	22	33	34
9	8	Control	9	Boy	4	Trombone	17	12	14	15	28	31
10	9	Experimental	9	Girl	4	Flute	13	17	12	18	35	37
11	10	Control	9	Girl	4	Clarinet	15	15	12	13	34	37
12	11	Control	10	Boy	5	Trombone	14	21	18	21	38	39
13	12	Experimental	10	Girl	5	Trombone	19	18	14	17	38	38
14	13	Control	10	Boy	5	Clarinet	15	18	17	18	34	30
15	14	Experimental	11	Boy	5	Trumpet	11	13	16	20	31	35
16	15	Experimental	11	Girl	5	Trumpet	17	20	17	20	34	38
17	16	Control	10	Girl	5	Trumpet	10	17	14	17	32	37
18	17	Experimental	10	Girl	5	Flute	19	18	17	20	36	37
19	18	Experimental	9	Girl	4	Clarinet	20	22	18	20	39	39
20	19	Experimental	9	Boy	4	Trombone	16	12	16	19	36	35
21	20	Control	11	Boy	5	Trombone	19	17	11	17	35	31
22	21	Control	10	Girl	5	Flute	11	21	11	14	32	34
23	22	Control	10	Girl	5	Flute	19	19	16	17	35	34
24	23	Control	9	Boy	4	Clarinet	15	13	17	20	32	32
25	24	Control	10	Boy	5	Trombone	14	19	15	18	35	34
26	25	Experimental	10	Boy	5	Trombone	17	16	14	18	33	31
27	26	Experimental	10	Girl	5	Clarinet	14	10	12	12	31	32
28	27	Control	9	Boy	4	Trumpet	13	18	18	18	35	35
29	28	Control	11	Girl	5	Trumpet	15	11	12	13	20	29
30	29	Experimental	9	Boy	4	Trumpet	15	14	12	16	30	37
31	30	Experimental	9	Girl	4	Clarinet	13	12	7	15	31	36
32	31	Experimental	9	Girl	4	Clarinet	11	18	15	19	34	35
33	32	Experimental	10	Girl	5	Trumpet	15	18	16	20	32	35
34	33	Experimental	10	Boy	5	Trombone	14	15	17	17	33	36
35	34	Control	10	Girl	5	Clarinet	7	10	17	17	33	36
36	35	Control	9	Girl	4	Clarinet	16	18	18	17	37	36
37	36	Experimental	10	Girl	5	Trumpet	17	14	16	17	27	27
38	37	Control	9	Girl	4	Clarinet	15	16	16	19	36	35
39	38	Control	11	Boy	5	Trombone	19	13	11	18	38	38
40	39	Control	10	Girl	5	Flute	20	19	12	13	34	32
41	40	Experimental	10	Girl	5	Flute	16	18	13	20	28	31
42	41	Control	10	Boy	5	Trombone	17	18	15	19	30	36
43	42	Experimental	10	Girl	4	Clarinet	11	14	9	13	20	33
44	43	Experimental	10	Boy	5	Clarinet	10	14	16	20	35	37

Bibliography

Abeles, Harold F., Charles R. Hoffer, and Robert H. Klotman. *Foundations of Music Education*. Boston, MA: Schirmer Books, 1984. https://archive.org/details/foundationsofmus0000abel_b8h0/mode/2up.

Artman, William M., and Louis V. Hall. *Beauties and Achievements of the Blind*. Pub. for the authors, 1874. https://liberty.alma.exlibrisgroup.com/view/action/uresolver.do?operation=resolveService&package_service_id=15660880320004916&institutionId=4916&customerId=4915&VE=true.

"Audiation." GIML. Accessed November 19, 2023. https://giml.org/mlt/audiation/#:~:text=Audiation%20is%20the%20foundation%20of,(see%20types%20of%20audiation).

Ausman, Jennifer. "Sound Before Symbol Strategies and Beginning Band Performance Skills." *Canadian Journal for New Scholars in Education* 13, no. 2 (Fall 2022): 103-107. https://journalhosting.ucalgary.ca/index.php/cjnse/article/view/75284/56372.

Azzara, Christopher D. "Audiation-Based Improvisation Techniques and Elementary Instrumental Students' Music Achievement." *Journal of Research in Music Education* 41, no. 4 (Winter 1993): 328-342. https://doi.org/10.2307/3345508.

———. "Audiation, Improvisation, and Music Learning Theory." *The Quarterly* 16, no. 2 (Spring 1991): 106-109. http://www-usr.rider.edu/~vrme/v16n1/volume2/visions/spring12.

Azzara, Christopher D., and Alden H. Snell, II. "Assessment of Improvisation in Music." *Oxford Handbooks Online* (2016): 1-23. https://doi.org/10.1093/oxfordhb/9780199935321.013.103.

Azzara, Christopher. "Eastman School of Music." Accessed March 24, 2024. https://www.esm.rochester.edu/directory/azzara-christopher/.

Bacon, Terrence. "Gordon's Music Aptitude Tests." Lecture, GIML Quarterly Workshop, University at Buffalo, virtual, August 26, 2023.

Bailey, Jennifer. "Spiraling Instruction Using Music Learning Theory." *YouTube*. June 28, 2021. https://www.youtube.com/watch?v=JJ7h9GsXXus.

Beall, Gretchen. "Learning Sequences and Music Learning." *The Quarterly* 16, no. 2 (Spring 1991): 87-96. http://www-usr.rider.edu/~vrme/v16n1/volume2/visions/spring10.

Bernhard, Christian H. “Singing in Instrumental Music Education: Research and Implications.” *Update: Applications of Research in Music Education* 22, no. 1 (May 2002): 28-35. https://doi.org/10.1177/87551233020220010501.

———. “The Effects of Tonal Training on the Melodic Ear Playing and Sight-Reading Achievement of Beginning Wind Instrumentalists.” PhD diss., The University of North Carolina at Greensboro, 2003. In PROQUESTMS ProQuest Dissertations & Theses Global (Order No. 3093857). https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/dissertations-theses/effects-tonal-training-on-melodic-ear-playing/docview/305313817/se-2.

Bhandari, Pritha. “How to Find Outliers | 4 Ways with Examples & Explanation.” Scribbr. Last modified June 21, 2023. https://www.scribbr.com/statistics/outliers/.

Bluestine, Eric. *The Ways Children Learn Music: An Introduction and Practical Guide to Music Learning Theory*. Chicago, IL: GIA Publications, 2000.

———. “GIA Publications - The Ways Children Learn Music.” Accessed March 24, 2024. https://giamusic.com/resource/ways-children-learn-music-book-g5480.

Bruce Dalby. “The University of New Mexico Department of Music - College of Fine Arts.” Accessed March 24, 2024. https://music.unm.edu/faculty/bruce-dalby/.

Bunch, Ryan. “Pestalozzi and Music Education.” Accessed April 19, 2023. https://www.ryanbunch.com/2018/09/pestalozzi-and-music-education.html.

Burnsed, Vernon, and Pamela Fiocca. “Bringing General Music Techniques to the Instrumental Class.” *Music Educators Journal* 76, no. 6 (February 1990): 45-49. https://doi.org/10.2307/3400967.

Byo, James L. “Beginning Band Instruction: A Comparative Analysis of Selected Class Method Books.” *Update: Applications of Research in Music Education* 7, no. 1 (Fall 1988): 19-23. https://doi.org/10.1177/875512338800700106.

Çenberci, Senim, and Enver Tufan. “Effect of Music Education Based on Edwin E. Gordon’s Theory on Children’s Developmental Music Aptitude and Social Emotional Learning Skills.” *International Journal of Music Education* (2023). https://doi.org/10.1177/02557614231196973.

Chernin, Mallorie. “A Practical Application of an Eighteenth-Century Aesthetic: The Development of Pestalozzian Education.” *College Music Symposium* 26 (1986): 53-65. https://www.jstor.org/stable/40373822.

Choksy, Lois. *The Kodály Method: Comprehensive Music Education from Infant to Adult*. Englewood Cliffs, N.J.: Prentice-Hall, 1974. https://archive.org/details/kodalymethodcomp0000chok/page/14/mode/2up.

Clauhs, Matthew. "Beginning Band without a Stand: Fostering Creative Musicianship in Early Instrumental Programs." *Music Educators Journal* 104, no. 4 (July 2018), 39-47. https://doi.org/10.1177/0027432118768383.

Claxton Bunnie L., and Carol Dolan. *Step-by-Step Guide to Writing a Literature Review for Doctoral Research*. Dubuque, IA: Kendall Hunt Publishing, 2022.

Cohen, Jacob. "Things I Have Learned (So Far)." *American Psychologist* 45, no. 12 (1990): 1304-1312. https://doi.org/10.1037//0003-066x.45.12.1304.

Compayré, Gabriel. *Pestalozzi and Elementary Education*. New York, NY: T. Y. Crowell and Company, 1907. https://books.google.com/books?id=H4wWAAAAIAAJ&printsec=frontcover#v=onepage&q&f=false.

Cutietta, Robert A. "Edwin Gordon's Impact on the Field of Music Aptitude." *Visions of Research in Music Education* 16, no. 2 (Spring 1991): 73-77. http://www-usr.rider.edu/~vrme.

Dalby, Bruce. "Teaching Audiation in Instrumental Classes." *Music Educators Journal* 85, no. 6 (May 1999): 22-46. https://doi.org/10.2307/3399517.

Danahy, Alan. "Comparative Audiation Difficulty of Tonal, Rhythm, and Melodic Patterns Among Grade 4 Students." Master's thesis, University of South Carolina - Columbia, 2013. https://scholarcommons.sc.edu/etd/2564.

Daniels, Bruce C. *Puritans at Play: Leisure and Recreation in Colonial New England*. London: MacMillan, 1995. Internet Archive. https://archive.org/details/puritansatplayle0000dani/page/54/mode/2up.

Dick, Rudi J. "An Investigation of the Educational Influences on the Kodály Approach to Music Education." Master's thesis, University of Manitoba, 1996. https://mspace.lib.umanitoba.ca/bitstream/handle/1993/19195/Dick_An_investigation.pdf?sequence=1.

Dickey, Marc R. "A Comparison of Verbal Instruction and Nonverbal Teacher-Student Modeling in Instrumental Ensembles." *Journal of Research in Music Education* 39, no. 2 (Summer 1991), 132-142. https://doi.org/10.2307/3344693.

Doris, Lora. "Musical Pattern Perception." *College Music Symposium* 19, no. 1 (Spring 1979): 166-182. https://www.jstor.org/stable/40351765.

Dunlap, Michael P. “The Effects of Singing and Solmization Training on the Musical Achievement of Beginning Fifth-Grade Instrumental Students.” PhD diss., University of Michigan, 1989. In PROQUESTMS ProQuest Dissertations & Theses Global, https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/dissertations-theses/effects-singing-solmization-training-on-musical/docview/303811021/se-2. (No. 9013890).

Efland, Arthur. “Art and Music in the Pestalozzian Tradition.” *Journal of Research in Music Education* 31, no. 3 (Fall 1983), 165-178. https://www.jstor.org/stable/3345170.

Elliott, Charles A. “Effect of Vocalization on the Sense of Pitch of Beginning Band Class Students.” *Journal of Research in Music Education* 22, no. 2 (1974): 120-128. https://doi.org/10.2307/3345312.

———. “The Effectiveness of Singing in the Beginning Band Class.” *A Journal of Band Research* 9, no. 1 (Fall 1972), 38-39.

Etikan, Ilker. “Comparison of Convenience Sampling and Purposive Sampling.” *American Journal of Theoretical and Applied Statistics* 5, no. 1 (December 2016): 1-8. https://doi.org/10.11648/j.ajtas.20160501.11.

Eubanks, Kara. “Essays in the Theory and Practice of the Suzuki Method.” PhD diss., City University of New York, 2014. https://academicworks.cuny.edu/gc_etds/915/.

Farrer, Katie. “‘Sing to the Lord a New Song’: The Regular Singing Movement in Colonial New England.” *The Gettysburg Historical Journal* 3, no. 4 (2004): 1-20. https://cupola.gettysburg.edu/ghj/vol3/iss1/4.

Flohr, John W. “Short-Term Music Instruction and Young Children’s Developmental Music Aptitude.” *Journal of Research in Music Education* 29, no. 3 (Fall 1981): 219-223. https://doi.org/10.2307/3344995.

“Free Music Composition and Notation Software.” MuseScore. Accessed March 27, 2024. https://musescore.org/en.

“Free Templates for Teachers- Page 7 of 17.” SlidesMania. Accessed May 31, 2023. https://slidesmania.com/free-templates/education/page/7/.

Frego, R. J. David. “The Approach of Emile Jaques-Dalcroze.” Allianceamm. Accessed April 19, 2023. https://www.allianceamm.org/resources/dalcroze/.

Freire, Ricardo D., and Sandra F. Freire. “Towards a Theory of Music Instruction: A Dialogue Between Jerome Bruner and Edwin Gordon.” Conference session presented at 28th International Society for Music Education World Conference, Bologna, Italy, 2008.

Frost, Jim. “Cohens D: Definition, Using & Examples.” Statistics by Jim. Last modified June 27, 2022. https://statisticsbyjim.com/basics/cohens-d/.

“Gagné’s Nine Events of Instruction - Conditions of Learning.” The Peak Performance Center - Performance Excellence. Last modified July 4, 2014. https://thepeakperformancecenter.com/business/learning/business-training/gagnes-nine-events-instruction/.

Gates, James G. “Using Singing as a Teaching Tool in Brass Playing.” Master’s thesis, The University of Akron, 2017. https://ideaexchange.uakron.edu/honors_research_projects/(579).

Gazibara, Senka. “Head, Heart and Hands Learning - A Challenge for Contemporary Education.” *Journal of Education Culture and Society* 4, no. 1 (January 2020): 71-82. https://doi.org/10.15503/jecs20131.71.82.

GIML. “Skill Learning Sequence.” Accessed November 19, 2023. https://giml.org/mlt/skilllearningsequence/.

———. “Frequently Asked Questions – GIML – The Gordon Institute for Music Learning.” Accessed June 6, 2023. https://giml.org/resources/faq/#:~:text=By%20spending%20some%20instructional%20time,Not%20at%20all.

Gordon, Edwin. *Learning Sequences in Music: Skill, Content, and Patterns*. Chicago, IL: GIA Publications, 1988.

———. *Rating Scales and Their Uses for Measuring and Evaluating Achievement in Music Performance*. Chicago, IL: GIA Publications, 2002.

———. *The Aural/visual Experience of Music Literacy: Reading and Writing Music Notation*. Chicago, IL: GIA Publications, 2004.

———. *The Psychology of Music Teaching.* Upper Saddle River, MA: Prentice Hall, 1971.

———. *Essential Preparation for Beginning Instrumental Music Instruction*. Chicago, IL: GIA Publications, 2010.

———. *Iowa Tests of Music Literacy Manual*. Chicago, IL: GIA Publications, Inc., 1991.

———. *Learning Sequences in Music: A Contemporary Music Learning Theory*, 2012. Chicago, IL: GIA, 2012.

———. *Music Learning Theory for Newborn and Young Children*. Chicago: GIA Publishing, 2013. ProQuest Ebook Central https://ebookcentral.proquest.com/lib/liberty/detail.action?docID=1359672.

———. *Primary Measures of Music Audiation: A Music Aptitude Test for Kindergarten and Primary Grade Children*. Chicago, IL: GIA Publications, Inc., 1979.

———. *Roots of Music Learning Theory and Audiation*. Chicago, IL: GIA Publications, n.d. https://scholarcommons.sc.edu/cgi/viewcontent.cgi?article=1000&context=gordon_articles.

———. *Manual for the Primary Measures of Music Audiation (Kindergarten-Grade 3) and the Intermediate Measures of Music Audiation (Grade 1-Grade 6)*. Chicago, IL: GIA Publications, 1986.

———. "All About Audiation and Music Aptitudes." *Music Educators Journal* 86, no. 2 (September 1999): 41-44. https://doi.org/10.2307/3399589.

———. "Aptitude and Audiation: A Healthy Duet." *Medical Problems of Performing Artists* 3, no. 1 (March 1988): 33-35. http://www.jstor.org/stable/45440648.

———. "GIA Publications - Iowa Tests of Music Literacy - Level 1 Kit." Accessed August 6, 2023. https://www.giamusic.com/store/resource/iowa-tests-of-music-literacy-level-1-kit-book-g3636l1.

———. "GIA Publications - Iowa Tests of Music Literacy - Test Manual." GIA Publishers Inc. Accessed August 6, 2023. https://www.giamusic.com/store/resource/iowa-tests-of-music-literacy-test-manual-book-g3636m#:~:text=All%20six%20levels%20are%20organized,for%20Grades%207%20through%2012.

———. "Intermediate Measures of Music Audiation (Grades 1-6) - Test Manual." GIA Publications Inc. Accessed August 6, 2023. https://www.giamusic.com/store/resource/intermediate-measures-of-music-audiation-grades-16-test-manual-book-g2593m.

———. "Music Aptitude and Related Tests: An Introduction." GIA Publications, Inc. Accessed December 16, 2023. https://giamusicassessment.com/pdfs/About%20Music%20Aptitude%20and%20Related%20Assessments.pdf.

———. "Taking a Look at Music Learning Theory an Introduction." *General Music Today* 8, no. 2 (Winter 1995): 3-8. https://doi.org/10.1177/104837139500800202.

———. “The MLT Approach.” GIML. Accessed April 21, 2023. https://giml.org/mlt/methodology/.

Grant, Cynthia, and Azadeh Osanloo. “Understanding, Selecting, and Integrating a Theoretical Framework in Dissertation Research: Creating the Blueprint for Your House.” *Administrative Issues Journal: Connecting Education, Practice, and Research* 4, no. 2 (n.d.): 12-25. https://doi.org/10.5929/2014.4.2.9.

Green, John A. *The Educational Ideas of Pestalozzi*. London: University Correspondence College Press, 1905. https://books.google.com/books?id=wI0WAAAAIAAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false.

Grey, Alyssa N. “Rote Instruction in Secondary Instrumental Music Classrooms: A Review of the Literature.” *Update: Applications of Research in Music Education* 39, no. 1 (February 2020), 59-69. https://doi.org/10.1177/8755123320909149.

Grunow, Richard F. “Music Learning Theory: A Catalyst for Change in Beginning Instrumental Music Instruction.” In *The Development and Practical Application of Music Learning Theory*. Edited by M. Runfola and C. Crump Taggart (Suffolk, VA: Boydell & Brewer, 2005.

———. “Eastman School of Music.” Accessed March 24, 2024. https://www.esm.rochester.edu/directory/grunow-richard/.

Grunow, Richard E., Edwin E. Gordon, and Christopher D. Azarra. *Jump Right In Instrumental Series: For Winds and Percussion: Book 1 and 2*. Chicago, IL: GIA Publications, 2001.

Grutzmacher, Patricia A. “The Effect of Tonal Pattern Training on the Aural Perception, Reading Recognition, and Melodic Sight-Reading Achievement of First-Year Instrumental Music Students.” *Journal of Research in Music Education* 35, no. 3 (Fall 1987): 171. https://doi.org/10.2307/3344959.

———. “The Effect of Tonal Pattern Training on the Aural Perception, Reading Recognition and Melodic Sight-Reading Achievement of First Year Instrumental Music Students.” PhD diss., Kent State University, 1985. In PROQUESTMS ProQuest Dissertations & Theses Global, https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/dissertations-theses/effect-tonal-pattern-training-on-aural-perception/docview/303354452/se-2. (8514172).

Helga R. Gudmundsdottir, Carol Beynon, Karen Ludke, and Annabel J. Cohen. “Singing in Instrumental Music Instruction.” In *The Routledge Companion to Interdisciplinary Studies in Singing, Volume II: Education*. London: Routledge, 2020. Accessed June 1, 2023. ProQuest Ebook Central.

Harper, Robert. “Frequently Asked Questions about Music Learning Theory.” *General Music Today* 8, no. 2 (Winter 1995): 11-13. https://doi.org/10.1177/104837139500800204.

Haston, Warren. “Beginning Wind Instrument Instruction: A Comparison of Aural and Visual Approaches.” *Contributions to Music Education* 37, no. 2 (2010): 9-28. https://www.jstor.org/stable/24127224.

———. “Comparison of a Visual and an Aural Approach to Beginning Wind Instrument Instruction.” PhD diss., Northwestern University, 2004. ProQuest https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/dissertations-theses/comparison-visual-aural-approach-beginning-wind/docview/305136907/se-2 (305136907).

Heller, George N., and Carolyn Livingston. “Lowell Mason (1792–1872) and Music for Students with Disabilities.” *The Bulletin of Historical Research in Music Education* 16, no. 1 (September 1994): 1-16. https://doi.org/10.1177/153660069401600101.

Hendricks, Karin S. “The Philosophy of Shinichi Suzuki: Music Education as Love Education.” *Philosophy of Music Education Review* 19, no. 2 (October 2011): 136. https://doi.org/10.2979/philmusieducrevi.19.2.136.

Hohn, Robert L. “An Educational Psychologist Considers the Work of Edwin Gordon.” *Visions of Research in Music Education* 16, no. 5 (2021): 10-17. https://opencommons.uconn.edu/vrme/vol16/iss2/5.

Hussey, Livera. “The Kodály Method: A Vocal Approach to Music Education.” Master’s thesis, Pembroke State University, 1989. https://libres.uncg.edu/ir/uncp/f/Livera%20Hussey.

“IRB Registration,” HHS.gov, last modified December 14, 2021, https://www.hhs.gov/ohrp/register-irbs-and-obtain-fwas/irb-registration/index.html.

James Byo. “Welcome to LSU, a Top Research University | Baton Rouge, La.” Accessed March 24, 2024. https://www.lsu.edu/cmda/music/people/faculty/byo.php.

Johann Heinrich Pestalozzi. “Research Begins Here - New World Encyclopedia.” Accessed May 5, 2023. https://www.newworldencyclopedia.org/entry/Johann_Heinrich_Pestalozzi.

“Johann Pestalozzi (1746–1827) Career and Development of Educational Theory, Diffusion of Educational Ideas.” Education Encyclopedia. Accessed May 5, 2023. https://education.stateuniversity.com/pages/2319/Pestalozzi-Johann-1746-1827.html.

Jordan-DeCarbo, Joyce. “A Sound-to-Symbol Approach to Learning Music.” *Music Educators Journal* 72, no. 6 (February 1986), 38-41. https://doi.org/10.2307/3401275.

Khadjooi, Kayvan, Kamran Rostami, and Sauid Ishaq. “How to use Gagné’s Model of Instructional Design in Teaching Psychomotor Skills.” *Gastroenterology and Hepatology from Bed to Bench* 4, no. 3 (Summer 2011): 116-119. https://pubmed.ncbi.nlm.nih.gov/24834168/.

“The Kodály Concept.” Kodály Music Institute. Accessed June 3, 2023. https://kodalymusicinstitute.org/about-kodaly-music-institute.

Kohl, Joshua E. “Improving Sight-Reading Through Beginning Band Instruction.” Master’s thesis, Liberty University, 2021. https://digitalcommons.liberty.edu/cgi/viewcontent.cgi?article=1771&context=masters.

Krueger, Carol, and Jill Wilson. “Foundations of Music Literacy: Jerome Bruner’s Contributions to Choral Music Education.” *Choral Journal* 59, no. 1 (August 2018). https://search.ebscohost.com/login.aspx?direct=true&db=asn&AN=130528889&site=ehost-live&scope=site.

Kurt, Serhat. “Robert Gagné’s Taxonomy of Learning.” Educational Technology. Last modified January 4, 2021. https://educationaltechnology.net/robert-gagnes-taxonomy-of-learning/.

Laerd Statistics. “Assumptions.” SPSS Statistics Tutorials and Statistical Guides | Laerd Statistics. Accessed March 17, 2024. https://statistics.laerd.com/premium/spss/istt/independent-t-test-in-spss-7.php.

———. “Calculating and Reporting and Effect Size.” SPSS Statistics Tutorials and Statistical Guides | Laerd Statistics. Accessed March 17, 2024. https://statistics.laerd.com/premium/spss/istt/independent-t-test-in-spss-19.php.

———. “Independent *t*-Test Using SPSS Statistics.” SPSS Statistics Tutorials and Statistical Guides | Laerd Statistics. Accessed March 17, 2024. https://statistics.laerd.com/spss-tutorials/independent-t-test-using-spss-statistics.php.

———. “Features - Assumptions in SPSS Statistics.” SPSS Statistics Tutorials and Statistical Guides | Laerd Statistics. Accessed March 17, 2024. https://statistics.laerd.com/features-assumptions.php.

———. “Sampling: The Basics.” The Online Research Guide for Your Dissertation and Thesis | Lærd Dissertation. Accessed March 24, 2024. https://dissertation.laerd.com/sampling-the-basics.php.

Lammers, William J., and Pietro Badia. *Fundamentals of Behavioral Research*. Belmont, NY: Wadsworth Publishing Company, 2005. https://uca.edu/psychology/files/2013/08/Ch10-Experimental-Design_Statistical-Analysis-of-Data.pdf.

Lange, Diane M. *Together in Harmony: Combining Orff Schulwerk and Music Learning Theory*. Chicago, IL: GIA Publications, 2005.

———. "The University of Texas at Arlington." Accessed March 24, 2024. https://www.uta.edu/academics/faculty/profile?username=lange.

Laubach, Maria, and Joan K. Smith. "Educating with Heart, Head, and Hands: Pestalozzianism, Women Seminaries, and the Spread of Progressive Ideas in Indian Territory." *American Educational History Journal* 38, no. 1 (n.d.): 341-356. https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/scholarly-journals/educating-with-heart-head-hands-pestalozzianism/docview/1034734650/se-2.

Liperote, Kathy. "Singing in Instrumental Music Instruction." *The Routledge Companion to Interdisciplinary Studies in Singing*, 2020, 451-461. https://doi.org/10.4324/9781315162607-36.

———. "Audiation for Beginning Instrumentalists: Listen, Speak, Read, Write." *Music Educators Journal* 93, no. 1 (September 2006): 46-52. https://doi.org/10.2307/3693430.

MacKnight, Carol B. "The Development and Evaluation of Tonal Pattern Instruction in Music Reading for Beginning Wind Instrumentalists." PhD diss., University of Massachusetts Amherst, 1973. file:///D:/The%20development%20and%20evaluation%20of%20tonal%20pattern%20instruction_MacKnight%20Diss.pdf.

Mark, Michael L. "A New Look at Historical Periods in American Music Education." *Bulletin of the Council for Research in Music Education* 99 (Winter 1989): 1-6. https://www.jstor.org/stable/40318321.

Mark, Michael L. and Patrice Madura. *Contemporary Music Education*. Boston, MA: Cengage Learning, 2014.

Mason, Lowell. *Manual of the Boston Academy of Music: For Instruction in the Elements of Vocal Music, on the System of Pestalozzi*. Boston, MA: J. H. Wilkins & R. B. Carter, 1836. https://archive.org/details/manualofbostonac00maso_1/page/n3/mode/2up.

McLeod, Saul. "Jerome Bruner's Constructivist Theory of Learning and Cognitive Development." Simply Psychology. Last modified April 21, 2023. https://www.simplypsychology.org/bruner.html#:~:text=Bruner%20argues%20that%20language%20can,%E2%80%9Chere%20%26%20now%E2%80%9D%20concept.

Mishra, Prabhaker, Chandra M. Pandey, Uttam Singh, Anshul Gupta, Chinmoy Sahu, and Amit Keshri. "Descriptive Statistics and Normality Tests for Statistical Data." *Annals of Cardiac Anaesthesia* 22, no. 1 (March 2019): 67-72. https://doi.org/10.4103/aca.ACA_157_18.

Morgan, Susan, Tom Reichert, and Tyler R. Harrison. *From Numbers to Words: Reporting Statistical Results for the Social Sciences*. London: Routledge, 2016.

Moore, Janet L. S. "Toward a Theory of Developmental Music Aptitude." *Research Perspectives* 1 (Fall 1990): 19-23. https://www.ingentaconnect.com/content/fmea/rpme/1990/00000001/00000001/art00006?crawler=true#:~:text=The%20difference%20between%20music%20aptitude,achievement%20are%20not%20mutually%20exclusive.

Morris, Cheryl Nobles. "The Use of Pestalozzian Principles of Music Education in Selected Beginning Band Method Books (1996-1999)." PhD diss., The University of Southern Mississippi, 2000. In PROQUESTMS ProQuest Dissertations & Theses Global, https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/dissertations-theses/use-pestalozzian-principles-music-education/docview/304624315/se-2. (9988352).

Mullen, Andy. "Gordon's Skill Learning Sequence: The 30,000 Foot View." The Improving Musician. Last modified July 2, 2023. https://theimprovingmusician.com/gordons-skill-learning-sequence-the-30000-foot-view/.

Musco, Ann M. "Playing by Ear: Is Expert Opinion Supported by Research?" *Bulletin of the Council for Research in Music Education*, no. 184 (Spring 2010): 49-64. https://doi.org/10.2307/27861482.

Neumann, Carolyn. "The Kodály Method and Learning Theories." *The Canadian Music Educator* 47, no. 4 (Summer 2006): 48-49. https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/scholarly-journals/kodály-method-learning-theories/docview/1026918424/se-2.

Norman, Michael. "Developing Thinking Musicians in Instrumental Music." In *The Development and Practical Application of Music Learning Theory*. Edited by Maria Runfola and Cynthia Crump Taggart, 201-214. Suffolk, VA: Boydell & Brewer, 2005.

O'Donnell, Christian. "An Investigation of the Effect of Instruction in Edwin Gordon's Tonal and Rhythm Patterns on Secondary Students Advanced Measures of Music Audiation Scores." PhD diss., University of Oklahoma, 2011.

Orff, Carl. "The Schulwerk: Its Origin and Aims." *Music Educators Journal* 49, no. 5 (1963): 69-74. https://doi.org/10.2307/3389951.

Page, Marilyn. "Active Learning: Historical and Contemporary Perspectives." PhD diss., University of Massachusetts, 1990. https://files.eric.ed.gov/fulltext/ED338389.pdf.

Peacock Piano Studio. “Grand Staff Mnemonics.” Teaching Resources & Lesson Plans | TPT. Accessed September 1, 2023. https://www.teacherspayteachers.com/FreeDownload/Grand-Staff-Mnemonics-4741164.

Pearson, Bruce. *Standard of Excellence: Comprehensive Band Method: Book One*. San Diego, CA: Neil a Kjos Music Company, 1996.

Pestalozzi, Johann H. *How Gertrude Teaches Her Children: An Attempt to Help Mothers to Teach Their Own Children and an Account of the Method*. Syracuse, NY: Swan Sonnenschein & Co., 1894. https://ia803408.us.archive.org/1/items/howgertrudeteach00pestuoft/howgertrudeteach00pestuoft.pdf.

Pinzino, Mary Ellen. “Audiation - Another Way of Knowing.” Come Children Sing. Last modified 1994. https://www.comechildrensing.com/pdf/selected_articles_music_teacher_page/1_Audiation--Another_Way_of_Knowing.pdf.

Reeves, Scott, Mathieu Albert, Ayelet Kuper, and Brian D. Hodges. “Why Use Theories in Qualitative Research?” *BMJ* 337 (August 2008): a949-a949. https://doi.org/10.1136/bmj.a949.

Rich, Arthur L. “Lowell Mason, Modern Music Teacher.” *Music Educators Journal* 28, no. 3 (1942), 22-24. https://doi.org/10.2307/3385901.

Runfola, Maria E. “Graduate School of Education - University at Buffalo.” Last modified January 22, 2024. https://ed.buffalo.edu/about/directory/faculty/profile.html?uid=runfola.

Runfola, Maria, and Cynthia C. Taggart. *The Development and Practical Application of Music Learning Theory*. Chicago, IL: GIA Publications, 2005.

Sarrazin, Natalie. *Music and the Child*. New York, NY: Open SUNY Textbooks, 2016.

Seifert, Rick. “Audiation Football: An Acculturation Game.” *The GIML Audea* 3, no. 2 (Winter 1997): 13, https://drive.google.com/file/d/1RdPpFOnWKluBYIziWpYt3ZkVjNdIoMMG/view.

Shuler, Scott C. “A Critical Examination of the Contributions of Edwin Gordon’s Music Learning Theory to the Music Education Profession.” *Visions of Research in Music Education* 16, no. 7 (2021): 37-58. https://opencommons.uconn.edu/vrme/vol16/iss2/7.

Slides Mania. “Digital Notebook with Stickers | Free PowerPoint Template & Google Slides Theme.” SlidesMania. Last modified August 9, 2023. https://slidesmania.com/digital-notebook-and-free-stickers/.

"Soli Deo Gloria." *Canva*. 2024. https://www.canva.com/education/.

Sommervelle, Christopher. "Thinking in Sound: A Survey of Audiation in Australian Music Students." PhD diss., The University of Melbourne, 2016. file:///D:/Liberty%20U/Dissertations/Thinking%20in%20Sound_A%20Survey%20of%20Audiation%20in%20Australian%20Music%20Students_SOMMERVELLE%20PhD%20THESIS%20upload.pdf.

Stokes, W. Ann. "Is Edwin Gordon's Learning Theory a Cognitive One?" *Philosophy of Music Education Review* 4, no. 2 (Fall 1996): 96-106. https://www.jstor.org/stable/40495421.

Sullivan, Gail M., and Richard Feinn. "Using Effect Size—or Why the *P* Value Is Not Enough." *Journal of Graduate Medical Education* 4, no. 3 (September 2012): 279-282. https://doi.org/10.4300/jgme-d-12-00156.1.

Taggart, Cynthia. "GIA Publications." Accessed March 24, 2024. https://giamusic.com/artists/cynthia-taggart.

Thomas, Karen Sanders. "The Effect of Aural Instruction with Tonal and Rhythm Patterns from Edwin Gordon's Music Learning Theory on the Aural Discrimination Abilities of Second-Grade Students." PhD diss., The University of North Carolina at Greensboro, 2016. https://libres.uncg.edu/ir/uncg/f/Thomas_uncg_0154D_11906.pdf.

UCLA Statistical Methods and Data Analytics. "What Does Cronbach's Alpha Mean? | SPSS FAQ." OARC Stats – Statistical Consulting Web Resources. Accessed November 26, 2022. https://stats.oarc.ucla.edu/.

Valerio, Wendy. "The Gordon Approach: Music Learning Theory." Allianceamm. Accessed November 29, 2023. https://www.allianceamm.org/resources/gordon/.

West, Chad. "Sound Foundations: Organic Approaches to Learning Notation in Beginning Band." *Music Educators Journal* 102, no. 4 (June 2016): 56-61. https://doi.org/doi/10.1177/0027432116636941.

"Wheel of Names." Accessed September 30, 2023. https://wheelofnames.com/.