EARNHARDT, CAROL A. Ph.D. Descriptive analysis of a survey of sight-singing teaching methods and approaches by North Carolina high school choral music educators. (2021) Directed by Dr. Patricia Sink. 223 pp.

There are a variety of opinions among high school choral music educators concerning the most successful sight-singing teaching methods and approaches for high school students. The purpose of this study was to investigate the sight-singing methods and approaches of North Carolina high school choral music educators. A survey was designed to: (a) collect demographic information of the teacher, the school, and the choral program, (b) examine the attitudes of teachers toward sight-singing instruction, and (c) analyze preferences for and uses of sight-singing methods and approaches in the classroom.

The online survey was administered at each of the three North Carolina Music Educators Association (NCMEA) high school honors chorus audition sites. Participants (N = 127) included high school choral music educators whose students participated in the auditions. Ninety-eight percent of the participants (n = 125) responded that they provided sight-singing instruction during rehearsals, and thereby, were prompted to respond to additional items concerning: (a) attitudes toward sight singing; (b) choice of systems for tonal and rhythmic sight singing; (c) aural training strategies used for sight-singing instruction; (d) kinesthetic strategies used for sight-singing instruction; and (e) frequency and setting of sight-singing assessments.

Participants reported they *agreed* (12.1%; n = 15) or *strongly agreed* (87.9%; n = 109) that sight-singing instruction is important. Survey responses confirming this belief included the number of participants (81.5%; n = 101) who attended professional development for sight-singing instruction, and the number of participants (75%, n = 93) who elected to participate in ensemble sight-singing adjudication at the NCMEA choral adjudication event. Participants reported that they devoted an average of 30% of rehearsal time to teach students to sight sing.

Responses to the survey revealed that 98.4% of the participants (*n* = 123) used tonal solmization system and rhythmic syllabification systems during sight-singing instruction. Analysis of data revealed that the majority of participants preferred to use movable-*do* solfège for major-key tonal sight singing, movable-*do* solfège with tonic as *la* for minor-key tonal sight singing, and the Takadimi syllable system for rhythmic sight singing. Aural training strategies were used by 94.4% of participants (*n* = 118) during sight-singing instruction. The most frequently used aural training strategy was *imitation of a vocal demonstration*, and the least frequently used strategy was *improvisation*. Kinesthetic training was used for sight-singing instruction by 88.8% of the participants (*n* = 111). The most frequently used kinesthetic strategy was *solfège hand signs*, and the least frequently used kinesthetic strategy was *clapping*. Ninety-six percent of participants (*n* = 120) assessed student sight singing. The most frequently used setting for sight-singing assessments was *in small groups—performed live for the teacher*, and the least used setting was *in small groups—recorded in isolation*.

Results of the study emphasized several implications for the field of music education, including: (a) use of function-based systems for tonal and rhythmic instruction; (b) the separation of pitch from rhythm for sight-singing instruction; (c) repertoire choice that reflects the sight-singing ability of ensemble members; (d) participation in sight-singing adjudication at choral festivals; and (e) the use of aural training and kinesthetic activities in sight-singing instruction. A distinctive feature of the survey for this study was the investigation of aural training and kinesthetic activities used by high school choral music educators in sight-singing instruction—strategies that have not been thoroughly investigated at the high school level.

DESCRIPTIVE ANALYSIS OF A SURVEY OF SIGHT-SINGING TEACHING METHODS AND APPROACHES BY NORTH CAROLINA HIGH SCHOOL CHORAL MUSIC EDUCATORS

by

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Dr. Patricia Sink
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APPROVAL PAGE

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CHAPTER I: INTRODUCTION

A prominent goal in choral music education is to provide the skills necessary for students to confidently participate in lifelong music making. A fundamental part of that goal is the ability to sing music at sight. The importance of developing music reading skills is reflected in nationally published standards. The *MENC Task Force for National Standards in the Arts* (1994) emphasized the importance of music reading instruction by stating that students are empowered to be life-long, independent musicians when they are taught notation through singing, playing instruments, and composing. One of the directives of the 1994 Standards was that students in grades 9-12 should be able to read music at sight with accuracy and with expression. The current study is directed toward developing high school choral music students' music reading skills through learning to sight sing music.

Recent implementations of the National Core Music Standards (NCMS) redefined music literacy as the ability to "independently carry out the artistic processes of *creating* new music, *performing* existing music with understanding and expression, and *responding* to others' music with understanding" (Shuler et al., 2014, p. 45). While reading music at sight was not recognized by the NCMS as the sole indicator of musical literacy, it is listed as a skill necessary to allow students full participation and engagement in the artistic processes of creating, performing, and responding to music. (National Association for Music Education, 2021a). That is, music-reading skills are recognized as one of the foundational tenets of music education (Daniels, 1986; Demorest, 2004; Hales 1961; Killian, 1991; McClung, 2008; Norris, 2003).

Most choral music educators agree that teaching students to sight sing is important, and recognize the value of sight-singing skills in the musical lives of their students (Farenga, 2013; Floyd & Bradley, 2006; Kuehne, 2007; McClung, 2008; Sanders, 2015; Smith, 1998; Snider,

2007; von Kampen, 2003; White, 2009). The amount of instructional time used to teach sight-singing, however, is not indicative of the valuation of the skill by high school choral music educators. While some choral music educators feel that students who can sight sing learn music quicker and more efficiently than those who cannot sight sing (Floyd & Bradley, 2006), the majority of research demonstrates that choral music educators continue to spend minimal time on the essential skill of reading music (Demorest, 2001; Johnson, 1987; Norris, 2004; Sanders, 2015; Smith, 1998; von Kampen, 2003).

Research has shown that choral music educators increase the amount of instructional time devoted to sight singing when singers in their choral group are required to sight sing at state adjudications (Demorest, 2004; Johnson, 1987). Very few states, however, require sight singing as a part of the adjudication process (Norris, 2004). The disparity between the emphasis placed on music-reading skills in teaching standards and the commitment to assessment of sight-singing skills at state-level activities is discouraging, especially when most singers cannot perform at the level expected of them by the standards (Asmus, 2004; Bennett, 1984; Henry & Demorest, 1994; Middleton, 1984).

Despite decades of methodologies, research, and pedagogical experience, chorus students continue to leave high school with minimal skills in sight singing (Costanza & Russel, 1992; Phillips, 1988; Scott, 1996). Costanza and Russel (1992) lament that "sight singing…remains one of the weakest components in the teaching of choral music" (p. 501). Why is there such discrepancy between philosophy and practice and between expectations and ability? A few of the reasons for these dichotomies may be the lack of agreement on the best method to teach sight singing, the performance expectations of the high school choir, the lack of sight-singing

pedagogical training in universities, and the absence of concrete guidance from published research on the subject.

The Background of the Problem

The Lack of Agreement on The Best Method to Teach Sight Singing

Choral music educators autonomously choose the methods and approaches used to accomplish instructional goals. There are many textbooks from which teachers can choose methods to teach students to read music. The fact that there are so many textbooks devoted to sight singing demonstrates not only the importance of sight-singing skills but also the numerous possibilities and opinions about the best way to teach choral students to sight sing. Kuehne (2003) and May (1993) asked teachers to list method books used to teach sight singing. Between the two studies, there were nearly fifty different method books listed by respondents. Even so, choral music educators often avoid textbooks altogether, and instead, use self-composed examples or excerpts from choral literature as sight-singing exercises for instruction (Armstrong, 2001; Demorest, 2004; Farenga, 2013; Floyd & Bradley, 2006; May, 1993). There are many textbooks, but none that have been found to provide solid guidance for the most effective way to teach students to sight sing.

Based on research, the majority of choral music educators seem to use moveable-*do* solfège for tonal sight singing (Demorest, 2004; Farenga, 2013; Floyd & Bradley, 2006; May, 1993; Potter, 2015; Sanders, 2015; Smith, 1998; Snider, 2007; White, 2009; Yarbrough et al., 2007). The specific strategies used to teach sight singing with this solmization system in high school are unclear and leave many questions unanswered. Are students expected to know solfège before they reach the high school level? Do students use solmization syllables to read all musical scores, or do they only use solmization syllables to read tonal patterns and drills? Some choral

music educators require students to use hand signs with solfège; while other choral music educators believe there is no need to use them. Regardless of these questions, survey data have revealed that high school choral music educators prefer using moveable-*do* solfège for a pitch-reading system. Alternately, survey data have not revealed a strong preference by high school choral music educators for a system for teaching rhythms.

The choice of which system to use is most often based on prior experience and personal preference of the teacher rather than the efficacy of the system (Floyd, Eva, & Bradley, 2006). For the most part, sight singing is taught at random with no systematic plan to achieve reading goals. Students are typically in music classes throughout grade school and may be taught by different music educators throughout their K-12 experience. These teachers might all use a different system or method to teach sight singing. The lack of continuity of the way in which sight singing is taught from kindergarten through high school may cause confusion and may delay or prevent progression in curricular goals.

Kuehne (2010) maintains that sight-singing instructional practices may be influenced by the teaching culture of educators located within geographic areas. For the most part, however, students are taught how to sight sing the way their teacher was taught to sight sing. Constanza and Russell (1992) explain that teachers often use "techniques and methods that have been transmitted historically from one generation of teachers to the next, not always codified into an actual methodology" (p. 498). Choral educators often have grown up in environments where their musical talents were cultivated and encouraged by those around them—most likely one of the reasons that they became music educators in the first place. Their background may have included a culture with rich musical traditions, financial support to fund piano lessons, and multiple opportunities to practice their aural and singing skills. The strongest predictors of sight-

singing success are instrumental experience and the presence of a piano in the home (Daniels, 1986; Demorest & May, 1995; Hargiss, 1962; Henry, 2011; Henry & Demorest, 1994; Killian & Henry, 2005; Read, 1968). The culture of the choral music educator—not necessarily the methods and approaches of their teachers—could explain future success in sight singing and musical achievement. Effective teachers use instructional methods with student culture and background in mind (Lind & McKoy, 2016). Consequently, the methods used in training the choral music educator to sight sing may not be the best methods to train their students to sight sing. The pattern of using "traditional" methods may be the reason we continue to witness little improvement in the sight-singing ability of high school choral students.

The Lack of Time Due to the Performance Expectations of the High School Choir

High school choirs gain attention and support from the community and administrators through successful performances. High school choral educators feel pressured to perform to advocate for their program, to gain respect of administrators, and to recruit singers into their choral programs. Quality performances require rehearsal time—leaving little time for the instruction of sight singing. Phillips (1988) says that without such instruction, there continues to be "flawless performances by musically uneducated students…in American schools" (p. 27). High school choirs frequently perform music that is well beyond the level of the sight-singing ability of the choir members (Johnson, 1987). Henry and Demorest (1994) claim that instead of teaching students to sight sing performance literature, choral music educators rely "on rote teaching, imitation, sheer memorization, or other means to achieve a polished musical result" (p. 4). While these methods may seem to save time, the outcomes for such practices do not extend beyond the repertoire being learned for concerts.

The pressure to perform is often cited as the reason why choral music educators spend little time on sight-singing instruction. Most choral music educators feel strongly in the importance and need for sight-singing instruction. However, the time devoted to teaching students to sing music at sight is not proportionate to the status of the skill ascribed by choral music educators. Dwiggins (1984) recognized this phenomenon and questioned the objectives of high school choral programs.

> If [the objective] is to provide entertainment for the school and community through numerous performances during the school year, then many directors will continue as they have in the past—teaching music by what may seem to be the quickest method available (rote), incorporating sight-reading instruction only when the demands of an impending performance are not as immediate—and students will continue to graduate with little more to show for their choral participation than memories of high school performances. (p.11)

Perhaps, the reward systems established by our profession for high school choral educators cause them to neglect or deemphasize sight-singing instruction. These reward systems, such as invitations for conference performances and superior ratings at music festivals, recognize choirs and their directors who perform challenging literature flawlessly. Preparing for and participating in these "peak" performances provide positive experiences for students, providing connections to music making that are cherished throughout their lives. Choral music educators who focus solely on performance as the outcome of instruction deny students opportunities to build knowledge that often transfer to future music experiences. Students without musical independence are "relegated to a more passive position, musically dependent upon whomever will continue in the role of the high school teacher" (Apfelstadt, 1989, p. 75). Choral music educators should be rewarded for providing skills that will allow the student to experience these peak moments throughout their life.

The Lack of Sight-Singing Pedagogical Training in Universities

Singers who read music well learn choral literature quicker and easier than singers who cannot read music well. Choral music educators who desire such outcomes may want their students to have the ability to read music at sight, but they often lack the pedagogical skills necessary to teach their students how to sight sing. Research supports the premise that high school choral music educators feel quite confident in their ability to sight-sing, but as Farenga (2013) says, "there is a distinct difference between knowing how to sight sing and knowing how to teach students to sight sing" (p. 19).

The majority of high school choral music educators feel their college training has not prepared them to teach sight singing (Farenga, 2013; Floyd & Bradley, 2006; Smith, 1998; Kuehne, 2007; Myers, 2008; Potter, 2015). University ensemble directors, theory teachers, and other professors complain that music students enter their programs with very little ability to read music (Asmus, 2004; Scott, 1996). Students are selected for Schools or Departments of music at universities or colleges because of their advanced performance skills demonstrated during entrance auditions, “however, when they are asked to sight-read musical notation, the results are dreadful” (Asmus, 2004, p. 6).

Without basic music-reading skills, music education students often fail or perform poorly in theory and dictation classes that are considered requirements for a baccalaureate or associates degree in higher education. Perhaps the only students who successfully complete a music degree and enter the field of music education are those with the resources needed to afford additional music training outside of the K-12 school music classroom so that they enter university programs with the ability to read music. Gudmundsdottir (2010), however, maintains that there is no empirical evidence that clearly supports a notable positive and moderate or strong relationship

between the ability to perform music and the ability to read music. University music programs that accept students based solely on performance skills must be prepared to remediate those students who cannot sight sing, and must provide music education students the pedagogical skills to teach their future students to sight sing. Palkki (2010) proposes an aural skills curriculum in higher education where professors help struggling readers, while also modeling the processes required to teach music literacy to music students in K-12 music programs.

Without concrete guidance for sight singing pedagogy for university professors and high school choral music educators, choral education majors will continue entering the university unprepared for successfully completing traditional baccalaureate or associates degree requirements. Consequently, choral music educators will continue to graduate from degree programs with better reading skills but with insufficient pedagogical skills to prepare their students for entrance into university music programs. To help break this cycle, music faculty must commit to a collaborative environment where all departments focus on both the musicianship and the sight-singing pedagogical skills of preservice teachers.

The Lack of Concrete Guidance from Research

Since the earliest study on sight singing by Hillbrand in 1922, there have been nearly 700 studies conducted to determine a reliable method to teach sight singing (Mishra, 2014b). Many researchers have tested methods to find the most effective pedagogical interventions, while others sought to determine the factors and habits of both successful and unsuccessful sight singers. While these studies are numerous, results have often been inconclusive and the advice emerging from results conflict with guidance from other studies on the topic. Hodges (1992) found studies on music reading to be scattered and fragmented with no replication and noted that even when similar studies are grouped together, “there is rarely enough consensus to lead to a

broader conclusion" (p.467). In a meta-analysis of sight-reading studies, Mishra (2014b) found that validity errors were common in experiments that tested sight-reading interventions. Some validity errors included a study population with no randomization, a potential for teacher effects, and a lack of strict control over treatment. Despite the large number of studies conducted to improve sight reading, few methods and approaches have proven to be reliably effective. Further, advice to choral music educators concerning the use of specific methods and approaches in sight-singing instruction are often based on the results of a small number of studies (Mishra, 2014b, p. 132).

A common form of research in music education is the use of a survey questionnaire (Miksa & Elpus, 2018). Those interested in sight singing in the classroom have designed surveys for choral music educators that were intended to determine their attitudes toward sight-singing instruction, measure time spent on sight-singing instruction, collect demographic information of schools and choral programs, indicate performance goals of the ensemble, and discover sight-singing methods and systems used in the classroom. (Demorest, 2004; Farenga, 2013; Floyd & Bradley, 2006; Hales, 1961; Johnson, 1987; May, 1993; Myers, 2008; Potter, 2015; Sanders, 2015; Smith, 1998; Snider, 2007; Von Kampen, 2003; White, 2009). Survey results collected from participants are often used to represent the population. This extrapolation of data from the few to represent the many can be a weakness of the survey design (Rea & Parker, 2014). The problem with this type of research, however, lies mostly in the usefulness of the conclusions to the high school choral music educator. For example, surveys of teacher attitude are useful in describing how choral music educators feel about teaching sight singing but do not offer concrete methods and approaches that are the most efficient and effective. Surveys that collect information on instructional practices used in sight-singing instruction indicate the most popular

methods and approaches used by choral music educators. There has been no empirical evidence, however, of a positive and strong or moderate relationship between the popularity of sight-singing methods and approaches and the effectiveness of the methods and approaches (McClung, 2001). These types of surveys are also limited in scope and often do not include instructional activities beyond the teacher choice of tonal and rhythmic system.

Researchers have used survey data to show relationships between collected descriptive information and student sight-singing achievement (Daniels, 1986; Demorest & May, 1995; Henry, 2011; Henry & Demorest, 1994; Killian & Henry, 2005; Read, 1968). There correlational analyses have often demonstrated inequities in music education but failed to provide solutions within the high school choral music educators' control. In a number of studies, those students with instrumental experience typically achieved higher levels of sight-singing ability (Daniels, 1986; Demorest & May, 1995; Hargiss, 1962; Henry, 2011; Henry & Demorest, 1994; Killian & Henry, 2005; Read, 1968). Daniels (1986) found that students from large, predominantly white rural schools were more likely to score a high rating on a sight-singing test. The conclusions of Daniels' survey may be helpful in affirming the potential of students in such a school, but also demonstrate the vast inequities in the quality of instruction in sight singing across the country.

High school choral music educators are often expected to teach students with little to no experience in choir. Whether due to budget cuts in music, scheduling conflicts, or prior choral experiences, there are many students who join the high school choir with little to no sight-singing experience (McGuire, 2010). Many of the identified factors in the aforementioned studies have to do with the personal qualities and experience of students, leaving some to think that sight singing is a characteristic or an innate disposition that is not affected by training (Mishra, 2014a). The location of a school, the demographics of the school population, and the musical background

of the chorus students are not variables for which a teacher has control. High school choral music educators can, however, control how they teach sight singing. The goal of research in the field of sight singing should be to provide choral music educators with actionable steps and instructional methods that will improve their students achievement in singing music at sight—at any school and with any student.

The History of Sight-Singing Instruction

Benward (1965) stated that "sight singing is an established discipline the importance of which has been recognized by musicians for the past 300 years. It is doubtful that any other course in the entire music curriculum has enjoyed such prominence in history" (p. v). In fact, the problem of teaching sight-singing skills dates to a time long before formal music education existed. Guido d'Arezzo developed a system in the 11th Century that established the foundation for the use of solfège in contemporary music classrooms (Demorest, 2001; Kuehne, 2003). Guido used the initial syllable of the first six phrases of the hymn "Ut queant laxis" to name the steps *ut, re, mi, fa, sol, la* (Grout et al., 2010). His solmization syllables—so called because of the syllables *sol* and *mi*—became an efficient method to teach music and to help singers memorize the melodies used for church liturgy. "Guido boasted that he could 'produce a perfect singer in the space of one year, or at the most in two,' instead of the ten or more it usually took teaching melodies by rote" (Grout et al., 2019, p. 46). Guido's method for reading pitches has been used for a millennium and is the oldest sight-reading intervention documented in historical records (Mishra, 2014b). The solmization syllables have remained unchanged since the 11th Century with exception of two syllables: (a) the syllable *ut* was substituted with *do*; and (b) the syllable *ti* was added above *la*. Guido's system was used to teach sight singing to students in the earliest music classrooms in the United States.

In the 1700s, singing schools were established in the United States to improve the singing in churches. The schools originated in New England and spread throughout the colonies of North America. Sessions were held in homes, churches, or schoolrooms by travelling directors. Early singing-school masters composed songbooks and used the songs to improve the sight-singing abilities of attendees (Leonhard & House, 1972). Notation was taught using a modified solmization system with four syllables: *fa*, *sol*, *la*, and *mi* (Davenport, 1992). Each syllable in the system corresponded to specially shaped note. Americans trained in European music considered shape-note singing to be primitive. The homegrown system was abandoned as newly born public school music classrooms taught the European system with all seven solmization syllables: *do*, *re*, *mi*, *fa*, *sol*, *la*, and *ti* (Grout et al., 2019; Dettwiler, 1989).

Lowell Mason, a singing school master, was the first public school music educator in America. He taught at Hawes School of South Boston—volunteering his services and his supplies. He was a crucial force in convincing the Boston School Board of the importance of music education in the lives of children and in persuading school board members to add classes for music instruction to public schools in 1838. Mason was driven by early Pestalozzian ideas of education that would "permit pupils to relate life activities to education, thus making education more pragmatic" (Mark et al., 2007, p. 124). Consequently, Mason subscribed to the "rote before note" philosophy. In the first American music classes, students learned musical concepts through singing. Mason and his contemporaries were concerned about the wide-ranging state of musical illiteracy in the country at that time, so instruction was primarily designed to develop the music-reading abilities of students (Leonhard, 1972). In the quest to accomplish these goals, early music students practiced mechanical drills of scales and intervals and learned songs through a solmization system (Keene, 1982; Mark et al., 2007).

The *Manual of Instruction* was written by Lowell Mason in 1834 as the guiding curriculum for the first public music class. *Manual of Instruction* was one of the earliest textbooks designed to teach music reading to students in the United States (Phillips, 1984). Ideas presented in the book demonstrated the influence of educators and philosophers before Mason's time. Through the late 1800's and the turn of the century, states across the nation followed the example of the Boston School System and adopted music education as a part of their school curriculum. The focus of music education in these early classrooms can best be explained by the text description in John Tuft's book *The Normal Music Course* that was first published in 1883: "A series of exercises, studies, and songs, defining and illustrating the art of sight-reading; progressively arranged from the first conception and production of tones to the most advanced choral piece" (Tufts & Holt, 1887). Multiple books presenting different methodologies of teaching music reading were published in the last half of the nineteenth century (Phillips, 1984).

By the end of the nineteenth century, inclusion of music education into the general public-school curriculum became common practice throughout the nation. Vocal music was still the primary means of music instruction, but throughout the first part of the twentieth century, increasing numbers of professional orchestras and military bands called for the inclusion and growth of instrumental programs in secondary schools (Keene, 1982). As a response to the popularity of the band programs after 1920, the *a cappella* choir movement began in colleges. In 1911, the most notable *a cappella* choir was at St. Olaf College in Minnesota directed by a band director, F. Melius Christensen. High school choral music educators looking for a way to match the attractiveness of competitive band programs adopted the idea of the *a cappella* choir—the most non-instrumental form of singing (Demorest, 2001).

In 1928, the Flint High School A Cappella Choir from Flint, Michigan performed at the music supervisors' conference. Their performance gained national recognition as teachers at the conference saw the choir as the personification of the musicianship that could be accomplished with a high school choir. Jacob Evanson, director of the Flint choir, insisted that students read the literature being performed. In fact, it was the expectation of the *a cappella* choir movement that students would sight sing all literature, would rehearse without the piano, and would devote extra time to learning and memorizing all repertoire.

During the early 20th Century, competitions were held throughout the nation for *a cappella* choirs. These competitions included a rating for the performance of choral literature and for ensemble sight singing (Kegerreis, 1970). The *a cappella* choir tradition became the model for high schools around the country. With the expansion of this tradition, however, came a change to the emphasis on sight singing. Desperate to model the example from Flint and other successful high school *a cappella* choirs, directors relied on rote teaching and voice part drills to teach repertoire—ignoring sight-singing instruction altogether. In the end, the *a cappella* choir tradition "created generations of choral musicians with beautifully blended voices and high performance standards, who were entirely dependent upon a conductor in order to learn music" (Demorest, 2001, p. 14). While the *a cappella* choir movement helped preserve the inclusion of choral music education in the high school choral curriculum in the early 1900s, the movement did little to support the music-reading goals so revered in the nineteenth century.

The shift from the focus on sight singing by choral music educators in the 20th century was caused by more than the *a cappella* choir movement. Educational reforms, like the child-centered approach and comprehensive education, influenced the thinking and curricular shift of choral music educators. During the early 20th century, teaching music-reading skills was seen as

laborious and was considered a boring and unpleasant task for students. The practice of rote teaching became the norm as it was seen as the quicker and more direct way to musical pleasure (Armstrong, 2001). While band teachers stressed music fundamentals and trained students to read music, choral music educators stressed performance and taught literature using rote methods (Colwell, 1963; Daniels, 1986; Hales, 1961; May, 1993; Phillips, 1984). Comprehensive musicianship, birthed from educational reform of the 1960s and '70s, sought to balance performance with creativity and analysis. Choral literature was seen as the vehicle by which students explored music, but sight-singing instruction was all but ignored.

The introduction of the National Standards for Music Education in 1994 renewed awareness of the importance of music reading skills. The reiteration of those standards in 2014, the National Core Music Standards, called for further accountability of music educators to teach musical competencies that increase abilities in creating, improvising, and responding to music. Still, performance continued to be the dominating goal of many high school choral educators. Jellison (2004) argued that "learning to perform with competence and confidence is central to a musical life" (p. 200). While this statement is true, it is the responsibility of the choral music educator to ensure that students learn the sight-singing skills necessary for them to pursue musical goals and to participate in choral singing through adulthood.

Purpose of the Study

The purpose of this study was to investigate the sight-singing instructional practices of North Carolina high school choral music educators. A survey method was employed to: (a) collect demographic information of the teacher, the school, and the choral program, (b) examine the attitudes of teachers toward sight-singing instruction, and (c) indicate preferences for and use of sight-singing methods and approaches in the classroom. The goal of this study was to provide

a thorough understanding of the sight-singing instructional practices of high school choral music educators, including: (a) choice of system for tonal and rhythmic reading; (b) aural training strategies used for sight-singing instruction; (c) kinesthetic strategies used for sight-singing instruction; and (d) frequency and setting of sight-singing assessments. Data collected from the survey were used to answer the research questions of the study.

Research Questions

To accomplish the purpose of the study, the current study was designed to answer the following nine research questions.

1. What is the prevalence of high school choral music educators' incorporation of sight-singing instruction into rehearsals?
2. What are the prominent sight-singing instructional practices in high school choral rehearsals in the state of North Carolina?
3. What are the attitudes of North Carolina high school choral music educators toward sight-singing instruction?
4. How much time is spent in high school choral rehearsals on sight-singing instruction?
5. What solmization systems are used to develop pitch reading skills among high school choral students?
6. What syllabification systems are used to develop rhythmic reading skills among high school choral students?
7. What aural training strategies are used to develop high school choral students' sight-singing skills?
8. What kinesthetic strategies are used to develop high school choral students' sight-singing skills?
9. What strategies are used to evaluate the sight-singing abilities of high school choral students?

Need for the Study

There are numerous surveys of high school choral music educators concerning their attitudes toward sight-singing instruction in ensemble rehearsals; the amount of time spent to teach sight singing to high school singers; the methods, materials, and instructional practices used in the classroom; and the demographics of the teacher, of the school and of the choral program (Demorest, 2004; Farenga, 2013; Floyd & Bradley, 2006; Hales, 1961; Johnson, 1987; May, 1993; Sanders, 2015; Smith, 1998; Snider, 2007; Von Kampen, 2003; White, 2009). Most surveys of high school choral music educators are limited to teachers within a certain region or state. None specifically target the opinions and methods of high school choral music educators in North Carolina.

The most recent survey of high school choral music educators is by Farenga (2013). Participants in this study were high school choral music educators from Arizona. Farenga's survey was administered five years after the leadership of the Arizona Choral Educators (ACE) added an optional group sight-singing assessment to their choral adjudication festival. Farenga (2013) found that despite value placed on sight-singing instruction by Arizona high school choral music educators, there was a lack of participation in the ACE-supported sight-singing assessments at state choral adjudications. The North Carolina Music Educators Association (NCMEA) also sponsor music performance adjudications with an optional group sight-singing component.

Surveys of choral music educators fail to investigate the use of aural training methods and kinesthetic activities at the high school level (Floyd & Bradley, 2006; Sanders, 2015). Aural training and kinesthetic activities are supported by the methods and approaches of Kodály, Orff, Dalcroze, and Gordon, and are most often used at the elementary level. High school choral music

educators who use the methods and approaches of Kodály, Orff, Dalcroze, and Gordon may develop choral students with improved aural and sight-singing skills (Giles, 1991).

Two studies included one item on the use of aural training strategies in the high school choral classroom. Floyd & Bradley (2006) found that 39.13% of the Kentucky high school choral music educators they surveyed used dictation activities or games in sight-singing instruction. The survey was restricted to 46 directors of choirs that scored a distinguished rating in sight-singing assessments at the Kentucky Music Educators Association's district choral performance adjudications. In a qualitative study of eight successful choral directors' beliefs and perceptions of teaching choral sight singing, Sanders (2015) included a discussion of audiation with those he interviewed. All teachers in the focus group felt that audiation was a useful resource in sight-singing instruction, but only a few used audiation on a regular basis in their classroom. Apart from hand signs to indicate pitch, the use of kinesthetic activities to improve sight-singing skills have been rarely studied at high school level.

Understanding the various activities that are used to teach sight singing may bring us closer to a more efficient and effective method of teaching choral students to read music. University professors and ensemble directors may use this information to establish best practices with their students including the development of a pedagogical curriculum that will prepare future choral music educators to teach their students to sight sing. The current study investigates the sight-singing instructional practices of the high school choral music educator. In addition to teacher attitude towards sight-singing instruction, instructional time, solmization systems, and assessment, this study seeks to describe the current use of aural training strategies and kinesthetic activities in sight-singing instruction. This investigation was designed to fill the need for a more

comprehensive survey of methods and approaches used by high school choral music educators for sight-singing instruction.

Definition of Terms

Music literacy. The committee for the National Core Music Standards defines music literacy as "the ability to convey one's own musical ideas and to understand how others convey their ideas through music" (Shuler et. al, 2014, p. 45). By that definition, musical literacy implicitly requires all processes related to creating, performing, and responding to music. Frequently, music literacy has been used synonymously with the terms sight singing and sight reading in published professional literature prior to the publication of the National Core Music Standards (Shuler et al., 2014). For the purposes of this study, the terms sight singing and sight reading will be used interchangeably with music literacy, and refers to the act of decoding written musical notation to corresponding sounds.

Sight singing and sight reading. Sight reading often is used as a general term to describe the act of reading and producing sound from a written score with no prior exposure and preparation. The term sight reading often is used to describe the production of sound from an instrument, but also has been used to describe the act of singing music by sight. Sight singing is a more specific term than sight reading and describes the production of sound with the human voice. In the current study, the term sight singing operationally is defined as the act of reading music by choral students. If used in quotes from literature written by a different author, the term sight reading will be retained to preserve the authenticity of the author or authors.

Sight-singing systems. A sight-singing system refers to the various methods of ascribing a syllable, word, or number to tonal or rhythmic notation. In this study and the accompanying survey, solmization systems operationally refer to syllables used to perform tonal notation, and

syllabification systems refer to syllables used to perform rhythmic notation. These systems are described further in the literature review chapter of this document.

Aural Training. Aural training is any act implemented by a music educator with the intentions of improving students' ability to form aural images of pitches and rhythms. Singing music at sight requires an individual to "mentally construct aural images of notated pitches and then produce them, all without the aid of a mechanical pitch source" (Reifinger, 2018, pg. 72).

Kinesthetic Training. In this study, kinesthetic training operationally is defined as any activity that includes movement used by a music educator with intentions of improving student ability to sight sing. In the present study, the strong relationship between movement and music is discussed (Anderson, 2012).

CHAPTER II: REVIEW OF LITERATURE

The abandonment of sight-singing instruction in the choral classroom in the mid-twentieth century caused a deficiency in the music-reading abilities of vocal students as compared to instrumental students (Colwell, 1963). May & Elliott (1980) compared the scores on the *Gaston Test of Musicality* of 164 music students who served as subjects in their study. The subjects were administered the test in fourth grade. The same subjects who participated in a junior-high choir, band, or orchestra ensemble were readministered the *Gaston Test of Musicality*. In the fourth grade, subject test scores were similar. Despite similar test scores in the fourth grade, the subjects who participated in choir at the junior-high level scored significantly lower than subjects who participated in band or in orchestra ($p < .05$). Similarly, other researchers found the music-reading skills of college voice majors were deficient when compared to their instrumental major peers (Asmus, 2004; Crouch, 2010; Fournier et. al, 2017). This deficiency may be an indication of the decline of sight-singing standards at the secondary level.

In the last half of the 20th Century, discrepancies in the music-reading abilities of choral students as compared to instrumental students created a rejuvenation of interest in the development of sight-singing skills in choral music classrooms. Since that time, multiple studies and articles have been published on the subject of sight singing by vocal students. Studies have been designed to investigate the effect of instructional methods on sight-singing abilities (Apfelstadt, 1984; Bader, 2014; Bebeau, 1982; Cassidy, 1993; Colley, 1985; Egbert, 1990; Fust, 2006; Henry, 2008; Johnson, 1987; Killian & Henry, 2005; May, 1993; More, 1985); to study the effects of context on sight singing (Boyle & Lucas, 1990; Fine et al., 2006; Potts, 2009; Shehan, 1987); and to measure the effects of group instruction and assessment on individual sight-singing

achievement (Demorest, 1998; Henry, 1999; Henry & Demorest, 1994; Nolker, 2001). Numerous articles have been published to apply current research to the sight-singing instructional strategies, and to encourage high school choral music educators to include sight-singing instruction in their rehearsals (Giles, 1991; Justus, 1969; Lynch, 1983; Middleton, 1984). Multiple music teacher surveys have been administered to determine teacher attitudes toward sight singing, and their preferences for sight-singing teaching methods and approaches (Demorest, 2004; Farenga, 2013; Floyd & Bradley, 2006; Hales, 1961; Johnson, 1987; May, 1993; Myers, 2008; Nichols, 2012; Potter, 2015; Sanders, 2015; Smith, 1998; Snider, 2007; von Kampen, 2003; White, 2009).

Chapter II presents a review of the scholarly and pedagogical literature pertinent to the current study of sight-singing instructional practices. The first section of the review of literature includes a succinct description of four well-known pedagogues of music-reading literacy, including Zoltán Kodály, Émile-Jacques Dalcroze, Carl Orff, and Edwin Gordon. The second section of the review of literature includes a synopsis of literature and studies on the methods and systems prescribed for sight-singing instruction. The final section of the review of literature presents a summary of survey studies designed to describe the sight-singing instructional practices of high school choral music educators.

Kodály, Dalcroze, Orff, and Gordon

Elementary music teachers have long used the ideas and approaches of Kodály, Dalcroze, Orff, and Gordon. High school music educators often view these elementary teaching methods and approaches as unnecessary and ineffective at the high school level, thereby, abandoning them in favor of the expedient, yet often less efficient approach of rote learning. According to Cappers (1985), with rote singing “music learning stops and singing takes its place” (p. 46).

Continuing the use of these methods and approaches throughout middle and high school provide a continuation of excellent aural training begun at the elementary level, and offer effective means of teaching adolescent chorus students to sight sing (Collins, 1999; Giles, 1991). While high school choral educators use the ideas and approaches of Kodály, Dalcroze, Orff, and Gordon less than elementary music teachers, a discussion of these leading pedagogues will serve as a preface to examining the state of sight-singing instruction in high school chorus classrooms.

Kodály

Zoltán Kodály (1882-1967) was a Hungarian-born composer, music educator, ethnomusicologist, and advocate for universal music education. He felt that music was a way to develop the whole person by educating and nurturing the personality, the intellect, and the emotions. Because Kodály believed that music was the inherent right and heritage of every human being, his goal and life's work was to develop techniques that would make music literacy accessible for all.

> Teach music and singing at school in such a way that it is not a torture, but a joy for the pupil; instill a thirst for finer music in him, a thirst which will last for a lifetime. If the child is not filled at least once by the life-giving stream of music during the most susceptible period - between his sixth and sixteenth years - it will hardly be of any use to him later on. Often a single experience will open the young soul to music for a whole lifetime. This experience cannot be left to chance, it is the duty of the school to provide it. (Kodály, Z., 1974, p. 120)

Kodály believed that children should be taught music from what was most familiar to them. He used a rich collection of folk songs from his country as the basis for building the child's inner hearing. According to Gordon & Jordanoff (1993), Kodály used folk music for two reasons. First, folk music provided a vehicle for understanding culture, and consequently, understanding the cultures of other people. Second, folk music presented in a simple form the constructs of music that are used in more complex compositions. In Kodály's approach, the use

of folk music—a music familiar to students—served as a path to understanding musical concepts.

Ascribing to the Pestalozzian approach to teaching, Kodály believed that students were not prepared to read notation until *inner hearing* was fully developed. He believed that musical literacy was an outgrowth of the experience with Hungarian folk songs in the form of singing, movement, dance, and language. He used a simplified version of the *Galin-Paris-Chavé* system to help students verbalize rhythms before exposure to notation (Demorest, 2001). Students learned tonal patterns of folk songs using the relative solmization system (movable-*do* solfège syllables) with hand signs originally designed by Sarah Glover—and later refined by John Curwen—as a visual representation of the solfège syllables (Abril & Gault, 2016). Kodály modified the hand signs to serve as a supplemental aid to sight singing with the movable-*do* solmization system (Demorest, 2001). Collins (1999) suggested that the Kodály-based instructional approach would be an effective way to teach beginning high school students to sight sing.

Dalcroze

Émile Jacques-Dalcroze (1865-1950) was a professor of harmony and solfège at the Geneva Conservatory. He was troubled by the practice of teaching music theory as abstractions, disconnected from the experiences, emotions, and sensations of students (Dettwiler, 1989). Dalcroze believed that students who were taught with this disconnect lacked the skills to perform with expression and sensitivity. He intended to reform music education in a way that "develop[ed] students' hearing abilities, especially 'inner hearing', and [made] students thoroughly musical instead of simply teaching them to play an instrument" (Juntunen, 2016, p. 141). One of the most distinctive aspects of the Dalcroze approach was the use of movement to

express musical interpretation—both with tone and rhythm. The movements in the Dalcroze classroom were used in creative and dramatic dance, and were used functionally to illustrate musical concepts (i.e. to show pitch contour with the hand or demonstrate the rhythmic structure of music) (Abril, 2011). Rhythmic movements, often referred to as *Eurythmics*, were meant to be combined with aural skills development using improvisation and *Solfège-rhythmique*. Solfège-rhythmique was a system based on fixed-*do* where students listened and responded to changes in the sound in complete absence of printed notation (Demorest, 2001). Like Kodály, Dalcroze believed in sound-before-symbol and used his approach to prepare students to read music notation.

Although the Dalcroze approach never became a prominent part of the United States' music curriculum, many of his ideas and techniques were incorporated into other methods and instructional practices (Mark et al., 2007). Any use of movement to reinforce musical hearing is considered a use of Dalcroze techniques. Movement activities may include shifting body weight in tempo, altering walking direction to the A and B sections of music, tossing a ball up and down on the highest note sung in a measure, or using scarves to trace the contour of a melody. Juntunen (2016) explained that "Dalcroze teaching is based on a belief that what can be known through bodily experience, while often incapable of being expressed in words, is known at a deeper and often more functional level" (p.155). Henke (1984) suggested that choral music educators should use Solfège-rhythmique with their choir members to develop their aural perception of music.

Orff

Carl Orff (1895-1982) lived in Germany and is best known outside of the music education world as the composer of *Carmina Burana*. In addition to his interest in music, Orff's

love for theater and dance led him to a collaboration with Dorothee Günther, a dancer influenced by the ideas of Dalcroze. The two founded the Günther Schule, a school to train adult teachers in physical education. Orff planned to use the ideas of Dalcroze to develop creativity in his students. Orff first used barred instruments at the Günther Schule. Students improvised on various xylophones and metallophones to create accompaniments for gymnasium training programs (Benedict, 2010). The Günther Schule was destroyed during World War II. Later, as Orff reflected on his approach, he believed that his work would best suit children rather than adults as "music evolving from speech, movement, and dance could become the basis of early childhood education" (Mark et al., 2007, p. 438). Between 1950-1954, he published a five-volume reworking of his pre-war work, *Music for Children*. Orff's work became known as the *Orff-Schulwerk* approach. The Orff-Schulwerk approach attracted international attention and, in the 1970s, was adopted in schools throughout the United States.

Foundational to the Orff-Schulwerk approach was the creativity of both the students and the teacher. Children learned through discovery with activities that involved exploration, imitation, creation, and improvisation through speech, song, movement, and instruments. Recorders, drums, and specially made barred instruments were used to provide accompaniments to folk songs and dances in an environment where the process was more important than the resulting product (Beegle & Bond, 2016). Rhythmic patterns were imitated through speech using students' names or familiar objects. These patterns were translated into body percussion patterns through clapping, patsching, and snapping, then transferred to non-pitched percussion instruments. Melodic sequencing began with the descending minor third of *sol* to *mi* with other tones and intervals added as student ability increased. These tonal patterns were then transferred to pitched Orff instruments and recorders. Rhythmic and tonal ostinatos were built one upon

another and became the basis for accompaniments of improvisations, songs, games, and dances (Benedict, 2010).

Gordon

Edwin Gordon (1927-2015) began developing his music learning theory in the 1960s. He continued work on his theory through the 1970s, then in the 1980s, the theory was recognized by music educators as a complete and relevant theory of music teaching and learning. Through extensive research and study of general education and psychology research literature, Gordon developed his music learning theory to explain the ways in which children learn music (Bluestine, 2000). Gordon proposed that children learn to read music in much the same way they learn to speak, read, and write in their native language. Children must be exposed to music of all meters and tonalities, preferably using songs without words. Teachers who subscribed to Gordon's ideas taught tonal patterns exclusive from rhythm and taught rhythmic patterns exclusive from changes in pitch.

Gordon (2012) developed standardized measures or tests of music aptitude, defined as the "measure of one's potential to learn music" (p. 44). Gordon maintained that music aptitude stabilized at age nine and was distributed normally among the population. O'Donnell (2011) maintained, however, all children nurtured appropriately may develop high levels of aptitude in music. Like many educators before him, Gordon believed that children should not be exposed to symbols in music before developing a sense and understanding of the sounds of music. Gordon used the term *audiation* to describe inner hearing. Audiation was the process of hearing music that was not present. Audiation occurred when one was remembering music heard previously, imagining music never heard, or silently performing music while looking at notation (Gordon, 2012).

Gordon delineated a five-level skill-learning sequence for discrimination learning. Discrimination learning occurred when students were aware of being taught concepts, but did not fully comprehend why the concepts were being taught (Gordon, 2012). Tonal patterns and rhythmic patterns were introduced and practiced in the first three levels of discrimination learning: aural/oral, verbal association, and partial synthesis. Once students demonstrated aural competencies in the tonal and rhythmic patterns being studied, music symbols for the learned patterns were presented in the fourth level of discrimination learning, named symbolic association. In the final stage of discrimination learning called composite synthesis, students audiated, read, and wrote a series of tonal and rhythmic patterns learned in the first four stages of Gordon's learning process. Gordon believed that students should be taught tonal and rhythmic patterns using a function-based system. Gordon argued the use of the movable-*do*/*la*-based minor solfège syllables for tonal reading and a Gordon-developed system for rhythmic reading. James Foseth and Albert Blaser helped Gordon develop his first beat-function rhythmic system called *Tometics* (Bluestine, 2000).

The work of Kodály, Dalcroze, Orff, and Gordon profoundly affected music teachers, particularly those at the elementary level. Giles (1991) stressed that high school choral teachers should continue the development of aural skills through techniques practiced by elementary teachers. Using these same ideas at the high school level allows for the continued growth of the aural skills necessary to read advanced repertoire with complex rhythmic and tonal patterns.

Sight-Singing Instruction in the Music Classroom

Despite renewed interest in sight-singing instruction in the late 20th century, teaching singers to read music at sight continued to be one of the greatest challenges in choral music education. To attempt to solve this challenge, studies were designed to determine factors related

to sight-singing abilities among high school choristers and to identify strategies used by the most successful high school choral singers (Brown, 2001; Daniels, 1986; Demorest & May, 1995; Durocher, 2006; Ferrante, 2010; Henry, 2008; Killian & Henry, 2005; May & Elliott, 1980; O'Donnell, 2011; Stevenson, 2010).

Daniels (1986) found that the factors predicting sight-singing success were related to circumstances outside of the classroom, including: (a) attitudes of teachers toward sight-singing instruction; (b) instrumental experiences of individual chorus students; (c) presence of a piano in students' homes; and (d) location, ethnic make-up, or size of the school. Demorest and May (1995) found that the strongest predictors of sight-singing success were years of experience in a choral ensemble, results that contradicted previous studies (Daniels, 1986; May & Elliot, 1980). Demorest and May (1995) found that the number of years of private piano, vocal, or instrumental lessons were factors that predicted individual success in sight singing. Durocher (2006) found that age, choral experience, private voice lessons, and prior sight-singing instruction were positively and significantly related to sight-singing achievement ($p < .05$). Brown (2001), Ferrante (2010), and O'Donnell (2011) found that private lessons significantly affected he sight-singing ability of choral singers ($p < .05$). Factors, such as academic success, music aptitude, and personality, were found to be strong predictors of success in reading music at sight (Daniels, 1986; Demorest & May, 1995, Gromko, 2004; Harrison et al., 1994; Reifinger, 2018).

Killian and Henry (2005) compared strategies used by high school choral students when sight singing. Singers read two unfamiliar melodies—one after a 30-second preparation period and one with no preparation time. Scores from the initial assessment were used to organize singers into high-, medium-, and low-scoring groups. Video-recordings of the singers were then analyzed for strategies used before and during the performance of both melodies. The researchers

found that sight-singing accuracy scores were higher for the melody sung after a 30-second preparation period for students in the high- and medium-scoring group. The preparation period did not seem to affect the success of the students in the low-scoring group. Killian and Henry concluded that this lack of effect on the performance of students in the low-scoring group indicated that "such singers do not know effective strategies or cannot effectively use them" (Killian & Henry, 2005, p. 61). Some of the most successful strategies observed in the analysis of the high-scoring singers included: (a) tonicization exercises before performance; (b) singing out loud during the practice session; (c) keeping the beat on or in the body; and (d) using hand signs both in practice and in performance.

Henry (2008) investigated the effect of instruction of sight-singing strategies on the sight-singing achievement of high school choral students. Subjects at a Texas choir camp ($N = 63$) were categorized into high- and low-scoring groups using scores from a sight-singing pretest. Subjects in high- and low-scoring groups were then randomly assigned to a treatment group. Subjects in the first group received 30 minutes of instruction on the sight-singing strategies associated with both high- and low-level sight singers identified in the study by Killian and Henry (2005). Subjects in the second group received vocal training but did not receive instruction on the sight-singing strategies. While there was no significant improvement of high-scoring subjects ($p > .05$), the low-scoring subjects experienced significant improvement in posttest sight-singing ability ($p < .001$). Henry (2008) concluded that the strategies identified in the Killian and Henry (2005) study, when used prior to the posttest of subjects, resulted in the improvement observed in the low-level sight-singers. Strategies recommended by the Henry (2008) included: (a) establishing the key vocally before sight singing; (b) singing the entire melody out loud during the practice period; (c) keeping the beat in the body; (d) isolating trouble

spots and skipping easier spots during practice; (e) setting a steady tempo and keeping the tempo constant throughout the session; and (f) singing without stopping during the final performance of the example. Henry suggested that consistent instruction, practice, and assessment using the recommended strategies are needed to achieve optimal results.

Stevenson (2010) performed similar research on chorus students in Iowa and Illinois. Subjects in the treatment group were taught specific strategies that previously improved sight-singing achievement: (a) tonicization; (b) using solfège hand signs; (c) using a solmization technique (solfège, numbers, etc.); (d) singing out loud during practice; (e) keeping the beat with your body; (f) singing through the entire melody without stopping; (g) isolating challenging parts; (h) skipping easy parts; and (i) setting a steady tempo. Stevenson (2010) found that the strategies did not have a significant effect on the posttest sight-singing achievement of the students in the experimental group ($p > .05$). A low number of participants and a lack of instructional time possibly contributed to disparity between the current study and the 2008 study by Henry. Consistent with the 2005 findings of Killian and Henry, many of the strategies were used by high-level sight singers in the pre-test but were not used by low-level sight-singers in the pre-test. Stevenson (2010) reported that the preparation period was ineffective for beginning sight singers who were exposed to the strategies only during the study. He proposed that providing multiple sight-singing strategies for students who cannot process melodic information distracted them from sight singing.

Many reasons for the decline in sight-singing standards at the secondary level were identified in the related literature. Some of the reasons reported included a focus on comprehensive musicianship (Demorest, 2001), the amount of rehearsal time needed to prepare for performances (Dwiggins, 1984), and inadequate training in university pre-service programs

(Smith, 1998). The reason cited most frequently was the lack of guidance in the most efficient and effective instructional methods in improving the sight-singing ability of high school choral singers. Several researchers have attempted to compare the efficacy of certain sight-singing instructional methods, but results have failed to confirm the superiority of one method over all others (Smith, 1998).

Mishra (2014a) compared predictive factors found in studies related to music reading ability. The researcher's analyses of these studies revealed a stronger, more positive relationship between sight reading and musical concepts that can be practiced than between sight reading and stable characteristics like music aptitude, IQ, and personality. Mishra recognized ability to improvise, ear-training ability, technical ability, and music knowledge as some of the musical constructs that seemed to improve with instruction and practice. The remainder of this section of the literature review will include research on sight-singing methods, techniques, and activities using aural instruction, rhythmic and tonal instruction, kinesthetic activity, and assessment.

Aural Instruction

Aural skills instruction has been recognized as important in the development of competent musicians (Bluestine, 2000; Mishra, 2014a; Paney & Buonviri, 2014). For more than two hundred years, "sound before symbol" or "rote before note" has been a tenet promoted and supported by music educators and theorists. Kodály, Orff, Dalcroze and Gordon believed that students should experience music aurally before exposure to written notation. Kodály used familiar folk songs to aurally solidify understanding of rhythms and pitches. Orff used instruments, movement, and language to build aural imaginations of students. Dalcroze used movement and singing to enhance student musical expression, understanding, and sensitivity. In 1921, Dalcroze explained that "there is so intimate a connection between the vocal and aural

processes that the development of the one virtually involves the development of the other" (Jacques-Dalcroze, 1972, p. 34). Gordon used pitch and rhythmic pattern instruction to build a vocabulary of sounds aurally and orally before introducing notation. Using these practices supported by Kodály, Orff, Dalcroze and Gordon, elementary music teachers have included aural instruction to build student creativity and musical understanding.

The aural learning of music has long been recognized as an important step in building comprehension of musical concepts and in developing the ability to read music (Bernhard, 2003; Boyle and Lucas, 1990; Elliott, 1982; Ester et al., 2006; Fine et al., 2006; Gromko, 2004; Grutzmacher, 1985; Hayward & Gromko, 2009; Killian, 1991; McPherson, 1997; Mishra, 2014a; Petzold, 1960; Potts, 2009; Shehan, 1987; Wilson, 2016). Fine et al. (2006) concluded that musicians rely on preformed auditory representations of sound in order to correctly produce notation when sight singing. The researchers stressed the importance of aural training in developing music-reading literacy. In a meta-analysis of previously tested variables and sight reading, Mishra (2014a) found that aural training related most strongly and positively with the ability to read music at sight. Mishra concluded that "music activities that help the performer to form expectation quickly and predict compositional construction seem central to the process of sight-reading" (p. 461).

Gruzmacher (1985) studied aural perception training of tonal patterns to first-year instrumental students. Subjects ($N = 48$) were assigned randomly to a control group and an experimental group. Subjects received 30-minutes of instruction according to assigned treatment group. The treatment period lasted 14 weeks. In the experimental group, subjects were presented major and minor tonal patterns aurally during a ten-minute warm-up period. The tonal patterns were taught using vocalization and harmonization. At the end of the warm-up period,

experimental group subjects were introduced to the notation that corresponded to the tonal patterns practiced during the warm-up period. Subjects in the control group spent the 10-minute warm-up period reading and playing pattern drills from a method book. The process practiced by the subjects in the control group emphasized instrumental technique and note identification. Gruzmacher (1985) referred to the practice as the traditional way of teaching instrumental students to read music. Subjects in the experimental group scored significantly higher than those in the control group on both aural identification skills ($p < .001$) and on melodic sight reading ($p < .0001$). Gruzmacher concluded that sight-reading abilities are best improved through aural-based instruction of tonal patterns with an emphasis on the perception of tonal relationships within a harmonic framework.

Hayward & Gromko (2009) evaluated the sight-reading ability, technical proficiency, aural discrimination, and spatial visualization skill of seventy college-level wind players. Correlations of the variables corroborated findings by Elliott (1982) and Gromko (2004) that the speed and accuracy of sight-reading by wind players are best predicted by aural pattern discrimination, spatial-temporal reasoning, and technical proficiency. The researchers further asserted that aural skills were an important part of music reading because it aids the musician in forming a mental representation of notated music. Hayward and Gromko (2009) concluded that music educators should build an image of sound to provide a context of pitch through singing tonal solfège with hand signs, and to provide a context of rhythm through clapping, tapping, and talking with a number or syllabification system (p. 34).

Shehan (1987) studied the effects of a rote vs. note presentation on the learning and retention of rhythmic patterns. Twenty-five second-grade students and twenty-four sixth-grade students were asked to perform from memory rhythm examples presented in four modes of

presentation: a) audio-rhythm mode—rhythms played on a woodblock; b) audio-mnemonics mode--rhythms performed vocally using a Japanese mnemonics system; c) audio-visual mode—rhythms played on a woodblock and displayed visually as notation; d) audio-visual-mnemonics mode—rhythms performed on a woodblock, performed vocally using a Japanese mnemonic system, and displayed visually as notation. Students were allowed multiple trials to replicate each rhythm. The number of trials needed to perform the rhythm correctly was recorded and later compared for each mode of presentation. While older subjects required fewer trials than younger subjects, all required the smallest number of trials for the audio-visual-mnemonics mode of presentation. Shehan (1987) concluded that rhythmic reading is taught most efficiently by a multifaceted approach that includes the aural presentation of rhythm with an associated mnemonic system and with the accompanying notation.

Boyle and Lucas (1990) studied the effect of harmonic context on the sight-singing ability of college students. Subjects were 32 undergraduate music education majors from three levels of ear-training courses. Each subject was tested individually twice. In the first assessment, each subject read eight unfamiliar melodies at sight with harmonic accompaniment. One week later, each subject was assessed reading the same melodies without harmonic accompaniment. Tonal harmonic accompaniment was found to have a significant effect on sight-singing accuracy ($p < .001$). Subjects who were enrolled in the beginning level of ear training—the singers with the least amount of experience sight singing—benefitted most in the test with harmonic accompaniment. Boyle and Lucas concluded that students, especially in the early levels of sight-singing development, should receive tonal instruction that is carefully sequenced according to harmonic structure.

Riviere (2006) recognized the challenges of implementing aural-based concepts into performance-based ensembles at the high school level. Riviere proposed the benefit of adding aural instruction to the traditional model of rehearsing notated music. According to the author, aural activities reinforce the learning of musical concepts. Liperote (2006) called music an aural art and felt that aural training builds an understanding of tonality, meter, harmony, and style—an understanding required to read music with comprehension. Krueger (2007) wrote that the goal of aural skills training should produce a student who could "hear it in his or her mind without playing or singing it out loud" (p. xix).

To compare the effectiveness of an aural-based to non-aural-based method of sight-singing instruction, Potts (2009) compared the pre- and post-treatment sight-singing scores of beginning high school choir members from five different choirs. Members of the experimental group were given aural-based training using rote songs and solfège with accompanying hand signs. Aural training of subjects in the experimental group included echo singing using solfège and aural dictation of melodic and rhythmic patterns using hand signs. Members of the control group learned notated sight-singing examples from a textbook. Subjects in the control group read each note using solfège syllables with accompanying hand signs. In this way, the 2009 study of vocalists by Potts was very similar to Gruzmacher's (1985) study of instrumentalists. Potts (2009) found no significant difference between posttest scores of subjects in the control group as compared to subjects in the experimental group ($p > .05$). Subjects' scores, regardless of treatment assignment, improved from pretest to posttest. Subjects in the experimental group, however, experienced the greatest growth over the treatment period. Potts concluded that high school choral singers who are taught to sight sing using an aural-based method gain skills more efficiently than those who are taught using a non-aural-based method.

Audiation

In the Music Learning Theory (MLT), Gordon defined *audiation* as the ability to mentally hear music that had just been heard but was no longer sounding, mentally hear music from a written score, or mentally hear original music that had never been composed or performed. Gordon explained that imitation or inner hearing was a product, audiation was a process. In other words, as Gordon clarified ". . . imitation is analogous to using tracing paper to draw a picture whereas audiation is analogous to visualizing and then drawing a picture" (Gordon, 2012, p. 9). Gordon's MLT supported the premise that audiation skills be developed to prepare students to read notated music. In the first level of Gordon's inference learning, referred to as generalization, students aurally learned a vocabulary of rhythmic patterns in a variety of meters and a vocabulary of pitch patterns in a variety of tonalities. Gordon explained that students develop abilities to discriminate tonality and meter, and, in turn, successfully audiate, create, and perform original patterns. Bluestine (2000) further distiguished between the terms inner hearing and audiation. He maintained that students must do more than inner hearing to audiate. To audiate, students must process musical information. For students to process musical information, they must learn to understand music.

The Advanced Measure of Music Audiation (AMMA) was designed by Gordon (1989) as a measurement of the musical aptitude of students. Test items require subjects to concurrently audiate tempo, rhythm, meter, melody, harmony, and key. AMMA results include a tonal, rhythm, and total score.

O'Donnell (2011) investigated the effects of instruction using Gordon's tonal and rhythm patterns on the AMMA scores of high-school and middle-school band, choir, and orchestra members. Subjects in the experimental group were given instruction of Gordon's tonal and

rhythmic patterns using movable-*do* solfège with *la*-based minor for tonal patterns and the Gordon's rhythm syllables for rhythmic patterns. Subjects in the control group learned tonal and rhythmic sequences from Ottman's Music for Sight Singing (2004) using movable-*do* solfège with *la*-based minor for tonal patterns and the McHose and Tibbs (1957) system for rhythmic patterns. Subjects in both treatment groups were provided instruction by the researcher and all students used only their voice to perform tonal and rhythmic patterns. The researcher reported that by the end of the three-month treatment period, the students in the experimental group were improvising rhythmic patterns. The AMMA scores for students in the experimental group showed a slight increase with treatment. With exception of those students who were in private lessons outside of school, the AMMA scores for students in the control group decreased after the study period. O'Donnell's results concurred with a similar study by Estrella (1992) who found that aural instruction of tonal and rhythmic patterns had positive effects on the AMMA score of high school and college-level musicians.

To determine if audiation improved the performance of music at sight, Jezek (2017) observed 150 choirs and 82 directors as they performed at the University Interscholastic League (UIL) Sight-Reading Competition in North Texas. At the event, choirs were provided a one-minute preparation period prior to the first sight singing of a choral score prepared for their ability level. After the first performance, the choir experienced a two-minute instruction period in which the teacher or students were allowed to chant, tap, or clap. UIL rules dictated that neither the teacher nor students were allowed to produce the music tonally during the instruction time. The researcher noted whether the director asked the students to silently hear (i.e., audiate) the music during the instruction period and recorded the amount of time used for the audiation exercise. A total of 108 choirs (72%) used audiation at varying lengths of time during the

instruction period. While most of the choirs received a superior rating for sight singing, the choirs who spent the most amount of time in audiation were more likely to earn such a rating from the adjudicators. Jezek (2017) concluded that allowing ensemble members a period of audiation prior to sight-singing can lead to a successful performance of the material.

Gordon (2012) proposed that, before printed notation is introduced, students should exhibit mastery of audiation of tonal and rhythmic patterns through imitation, improvisation, and dictation. Very few studies focused on the effect of improvisation or dictation on the sight-singing skills of high school aged choral students. Improvisation and dictation were investigated among various musicians at the elementary and college-level that confirmed the value of such activities on subjects' musical understanding and music-reading ability (Azzara, 1993; Guibault, 2009; Karl, 1971; Norris, 2003; Tatting, 1975).

Improvisation

Many authors have recognized improvisation as an essential element of musical creativity and as an apparatus to develop and refine aural skills (Azzara, 1999; Beckstead, 2013; Hanna, 2007; Hickey, 1997; Scott, 2007; Whitman, 2001). Beaty (2015) defined improvisation as "one of the most complex forms of creative behavior" (p. 109). The authors of the 2014 National Core Music Standards included improvisation as one of the key tenets of the *creativity* strand (National Association for Music Education, 2014b). Kodály, Orff, Dalcroze, and Gordon used improvisation as a vehicle to build aural skills, and consequently, promoted an understanding of musical structure. Gordon (2012) asserted that students who can improvise rhythmic and tonal patterns have given meaning to music and are prepared to read notation. Azzara (1999) described improvisation as a musical vocabulary that "plays the role that speech and conversation play in language" (p. 22). Hanna (2007) labeled improvisation a cognitive process that required an

individual to reorganize their musical vocabulary into patterns or structures to generate new, coherent musical ideas.

Azzara (1993) studied the effects of improvisation techniques on the music-reading achievement of elementary instrumental students. Students at two different schools were randomly assigned to a control group and an experimental group. Subjects in both treatment groups received the same amount of instruction sequenced identically to include particular skills and content. Subjects in the experimental group spent 10-15 minutes of each lesson in improvisation performance activities. Subjects in the experimental group performed significantly higher on post-instruction reading than subjects in the control group ($p < .05$). Azzara concluded that a student's ability to improvise on their instrument translated to a clearer comprehension of the tonal, rhythmic, and expressive elements of music in a notated score.

Guilbault (2009) investigated the effects of harmonic accompaniment on the tonal improvisations of elementary students. Established music classes of subjects were randomly assigned to a control group or to an experimental group. All subjects received instruction based on Gordon's music learning theory with an incorporation of Orff activities. The only instructional difference between the two treatment groups was the use of a root melody played for the performance of rote songs and improvisational singing. Subjects in the control group performed all singing a cappella. Subjects' improvisations were recorded and later scored by three judges. The improvisation scores for subjects in the experimental group were significantly higher than the improvisation scores for subjects in the control group ($p < .05$). Guilbault concluded that teachers should include aural instruction with a root accompaniment to develop a student's ability to sense harmonic changes and, in turn, improve the improvisations of students. Since there was no significant difference found for the effect of grade level ($p > .05$), the

researcher advised teachers to provide aural instruction in multiple tonalities and harmonic functions for all ages of students.

Beckstead (2013) reported that despite the benefits of improvisation in music learning, many teachers and students fear improvisation and often associate it with one art form—jazz. Whitman (2001) cited reasons for the lack of improvisation instruction in the high school choral classroom. These reasons included: (a) the belief that improvisation was an individual skill rather than an activity designed for a large ensemble setting; (b) the belief that improvisation cannot be taught or learned; (c) the teacher's lack of skill in performing improvisations; and (d) the teacher's lack of training in the instruction of improvisation. Chandler (2018) agreed that further research was needed on how improvisation led to independent musicianship, but concluded that there was substantial evidence to demonstrate that improvisation improves aural skills. In an exhaustive search, Chandler found one study of the effect of improvisation on high school choral singers' sight-singing abilities.

Whitman (2001) studied the effect of vocal improvisation and practice on the sight-singing abilities, aural skills, and attitudes of high school singers. The control and experimental groups were populated with high school choral students from non-auditioned and auditioned choirs from one school in Kansas. Rehearsal plans were the same for both treatment groups with one exception: the subjects in the experimental group received comprehensive instruction and practice in vocal improvisation at each rehearsal for 15 minutes. The treatment period lasted for 18 weeks with 90-minute rehearsals every other day. Subjects were tested three times throughout the course of the study. The aural perception skills of subjects in the experimental group increased significantly more than subjects in the control group ($p < .05$), especially in the areas of interval identification and chord root identification. While scores in sight singing were not

significantly different between subjects in either treatment group ($p < .05$), the subjects in the experimental group experienced consistent increases in sight-singing scores throughout the course of the study. Whitman (2001) concluded that improvisational activities with high school choral singers can be used as a tool to further develop music reading skills and, in turn, ensure the success of the ensemble.

Dictation

The act of dictation has been described as the reversal of processes used to read music at sight—a process where students are required to respond in written form to an aural stimulus (Ferrante, 2010). Researchers have investigated the use of dictation as an instructional tool (Beckett, 1997; Buonviri, 2015; Buonviri, 2019; Hoppe, 1991; Klonoski, 2006; Pembrook, 1986; Powell, 2013). Most of the studies of the effect of dictation on music-reading ability involved the study of instrumental students (Earney, 2008; Jarrell, 1999), elementary-aged students (Granberry-Gordon, 1994; Tatting, 1975), AP music theory students (Paney & Buonviri, 2014), and college-aged students (Karl, 1971; Norris, 2003; Schleuter, 1993). In one of the earliest studies on the relationship between dictation and sight singing, Karl's (1971) study of collegiate non-music majors found a slightly moderate relationship between scores on sight-singing tests and dictation tests, but also found that instructional practices using dictation had no effect on student music-reading achievement level. In a study of fifth-grade singers, Tatting (1975) found that subjects taught to sight sing using a dictation-only approach scored higher on a sight-singing assessment than subjects who were taught to sight sing using traditional methods.

Norris (2003) investigated the effect of melodic dictation on sight-singing achievement in a pretest-posttest study of 41 music majors and non-music majors in an aural-perceptions class. All subjects were members of a freshman aural-perception class for music majors. Instruction

included the study of tonal and rhythmic patterns through sight singing and dictation exercises. The results demonstrated a moderately strong relationship between melodic dictation and sight singing. Norris (2003) concluded that sight-singing instruction that included the use of melodic dictation could improve the music-reading ability of students (p. 49). In a similar study, Rogers (2013) investigated the relationship of dictation with the sight singing, performance, and composition skills of senior high school students. Scores from two previous years of the *Australian New South Wales Music 2 Examination* were used to investigate the relationship between the variables. The highest correlations were found between dictation and sight singing.

Ferrante (2010) studied the effects of melodic dictation on the sight-singing achievement of high school choral singers. Students from two intact high school choirs were randomly assigned to a control group or an experimental group. For 5-7 minutes at the beginning of choir rehearsal, subjects in the experimental group participated in melodic-dictation tasks while subjects in the control group rehearsed vocal parts of choral repertoire. Treatment was administered twice a week over a 9-week period. Scores from a sight-singing pretest and posttest demonstrated a significant increase of sight-singing achievement for subjects in the control group and subjects in the experimental group ($p < .001$). There was no significant difference between the mean posttest score of subjects in the experimental group and the mean posttest score of subjects in the control group ($p > .05$). Ferrante (2010) suggested that an increased treatment period in future research may produce significant results in sight-singing skills using melodic dictation. Klonoski (2006) proposed that the lack of student success in dictation may be caused by the way in which it is taught. Traditional dictation instructional practices—with isolated and contrived passages—rely on skills that do not transfer to real-world musical experiences.

Error Detection

The ability to detect errors in performance has been recognized as an important aspect of aural skills development (Larson, 1977; Killian, 1991; Taebel, 1980). Using a survey of music teachers, Taebel (1980) developed and ranked a list of competencies by their impact on student learning. The highest rated competencies were those that required aural skills to detect errors in performance. The skill of error detection can be learned (Costanza, 1971; Deal, 1985; Ramsey, 1979; Stuart, 1979), but there is little evidence of the relationship between error detection and sight-singing ability.

In an investigation of the relationship between error detection, melodic dictation, and sight singing, Larson (1977) found significant positive relationships between all three variables of the study ($p < .05$); however, error detection was more strongly related to melodic dictation than to sight singing. The researcher used these findings to propose the importance of teaching error detection skills to college music majors in addition to the traditional instructional experiences of dictation and sight singing.

Killian (1991) investigated the relationship between sight-singing accuracy and error-detection abilities of 75 seventh- and eighth-grade singers enrolled in a large choral program in Texas. Prior to the study, subjects received 18-weeks of sight-singing training. Each subject was recorded sight singing eight musical passages. These recordings were evaluated by two experienced music educators. The researcher used scores from the sight-singing test to separate the subjects into three ability groups, including: (a) high-scoring group ($n = 26$); (b) medium-scoring group ($n = 24$); and (c) low-scoring group ($n = 25$).

In the Killian study, the same eight music passages were used for the initial assessment were used in a subsequent assessment of error-detection abilities of each subject. In this second

assessment, subjects circled errors in printed notation while listening to a performance of each passage by a singer. Subjects in the low scoring group scored significantly higher on the error-detection test than on the sight-singing test ($p < .01$). There was not a significant difference between error-detection scores and between sight-singing scores of subjects in the medium- and high-scoring groups ($p > .05$). Killian concluded that beginning readers benefitted more than advanced sight-singers from error-detection activities. Killian specified two reasons for the benefits of error detection activities in the initial stage of sight-singing instruction: (a) error-detection activities improve aural skills in uncertain singers; and (b) students gain confidence in their own skill of reading and understanding music in an activity that beginning students seem to complete with ease.

Rhythmic and Tonal Instruction

> The child who can recite the names of lines and spaces or even call notes by their letter or syllable names, but cannot hear and produce vocally at least the relative interval sounds of those notes, might just as well have been taught to wiggle his ears—as much learning would have taken place (Choksy, 1969, p. 59).

Shehan (1987) recognized the importance of aural training but added that music-reading skills were learned most efficiently through a combination of the aural representations of sound, a corresponding mnemonic system, and the notational symbols of the sound. In other words, a mastery of both pitch and rhythmic reading skills, in addition to aural skills, are required to develop competent sight-singing ability. Methods of teaching students to read rhythm and pitch are difficult to isolate and study. Because of the multiple dimensions combined within and between the rhythmic and tonal components of music, Sink (1984) maintained that measuring aural discrimination and aural-visual discrimination of interacting pitches and rhythms in musical patterns is challenging.

Peretz (1993) provided evidence of the cognitive segregation of pitch and rhythm by studying the musical perception of subjects who suffered brain impairments. Subjects with localized brain damage showed selective impairment of one dimension without effect on another dimension—subjects could perceive rhythm but not melody and vice versa. In a review of literature related to music and pitch cognition, Krumhansl (2000) noted that "rhythmic structures can influence the organization of pitch information, and pitch structures can influence the formation of rhythmic patterns. The evidence to date does not suggest that one aspect is psychologically primary" (p. 172).

Both pitch and rhythm have been considered essential dimensions in music perception, and consequently, the ability to sing music at sight. But the complex interaction between pitch and rhythm are not yet understood (Egbert, 1990). Most theoretical and empirical literature isolate the study of pitch and rhythm. For this reason, the review of literature related to tonal and rhythmic reading will be handled separately by this author.

Rhythmic Instruction

While numerous studies have been conducted on the best practices and pedagogy to teach sight singing in the choral classrooms, very few studies have focused solely on the teaching of rhythmic reading. This lack of investigative research on rhythmic-reading instruction is unfortunate, as the lack of rhythmic-reading ability has been shown to be a determining factor in a student's ability to read music at sight (Boyle, 1970; Henry, 2011; McPherson, 1994; Stegall, 1992). In an early study of the music-reading abilities of beginning band students, Boyle (1970) investigated the relationship between reading rhythms and reading music. Results of Boyle's study supported the premise that "that the ability to read music at sight is dependent in large part upon the ability to read rhythms at sight" (Boyle, 1970, p. 316). McPherson (1994) found that

instrumentalists struggled most with reading rhythmic notation with at least 80% of errors in sight-reading due to rhythmic-reading inadequacies. Henry (2011) found similar results with choral students citing rhythmic success as a strong predictor of pitch success. Subjects in Henry's study were more likely to perform pitch accurately if they were able to perform rhythms accurately. Stegall (1992) found that students who received regular rhythmic training became better sight singers than those who received no training. Several studies have found that the study of rhythmic patterns improves sight reading (Boyle, 1970; Parker, 1979; Tucker, 1969), but there is little agreement on the most efficient and effective way to teach rhythmic patterns (Demorest, 2004; Justus, 1969; Smith, 1998).

Mnemonic systems have been used by choral music educators to train students to read rhythms (Demorest, 2004; Potter, 2015; White, 2009). The earliest use of mnemonic aids to teach rhythm was in the 19th Century. *French Time-Names* were used as mnemonic learning aids invented by mathematician Pierre Galin in the 1800s, and were later modified by physician Émile Chevé, lawyer Amié Paris, and his wife, Nanine. The complete rhythmic system was published in 1844 and was referred to as the *Galin-Paris-Chavé* system (Demorest, 2001). This mnemonic system set the foundation from which other rhythmic systems were developed.

Shehan (1987) maintained that the use of mnemonics to teach rhythm may provide an "acoustic property that is influential in learning and recalling rhythms" (p.124). Ester et al. (2006) explained that rhythmic systems can serve as the link between what is recited and learned aurally, and between what is seen in printed notation. Mnemonic systems for rhythm can be placed in three categories: (a) systems that use words as syllables, (b) number-based systems, and (c) systems that use original syllables (Pallki, 2010).

Word-Based Systems. In systems that use words as syllables, teachers draw words from the natural language of students, use the accent and inflection of those words to develop student understanding of rhythmic patterns, and introduce those patterns in notation (Demorest, 2001). For example, the word "apple" may be spoken to represent a set of eighth notes and the word "plum" may be spoken to represent a quarter note. The most common system that used words to represent rhythms was created by Carl Orff. Orff believed rhythm should be isolated and taught independent of melody, and that children could learn rhythm through naturally occurring strong and weak patterns in spoken language. In the Orff-Schulwerk approach, teachers assign words to rhythmic values based on the syllabification (i.e., strong and weak patterns) of a word.

Babeau (1982) used a pretest and posttest design to compare the effect of a traditional number-based system and a word-based system on the rhythmic-reading abilities of third-grade students. Subjects were given daily instruction in reading rhythms for a period of 18 days. Subjects in the control group clapped a steady beat while reciting a rhythmic pattern using a number-based counting system. Subjects in the experimental group were taught to read rhythms with a speech-cue system developed by the researcher. The system was designed from the work of Orff and Kodály. Subjects using the word-based system demonstrated greater results in the ability to read rhythms. Scores of subjects in the experimental group were less varied than scores of those subjects in the control group. Babeau (1982) suggested that understanding and reading rhythms using the number-based system required an understanding of mathematics and fractions. The lack of variance among scores of subjects taught using the word-based system demonstrated that the system could be used successfully with students of varying abilities.

Number-Based Systems. Results from surveys of high school choral music educators showed the most used mnemonic system for rhythmic reading was counting beats using numbers

(Demorest, 2004; White, 2009). In number-based systems, numbers (1, 2, 3, etc.) mark the initial attack of the beat, then subdivisions of each beat are spoken with "e-&-a" or with some other form of neutral syllable (Pallki, 2010). An elaborate system of counting rhythms, the Eastman system, was developed by McHose and Tibbs (1957). In the Eastman system, each attack of a beat was matched with the ordinal number of the placement of that beat in the measure. Syllables for divisions and subdivisions were prescribed for placement within the beat. For example, four sixteenth notes on the third beat of the measure would be pronounced "3-ta-te-ta." The Eastman system contained a set of syllables for simple (1-ta-te-ta) and compound (1-la-le) meter. In the 1970's, Edwin Gordon promoted a similar number-based system called *Tometics* that distinguished meter by a different syllable set in simple (1-ne, 2-ne) and compound (1-na-ne, 2-na-ne) meter. Gordon later traded his number-based system for a syllable-based system but remained true to the idea of building unique subdivision syllables for simple and compound meter (Potter, 2015).

Egbert (1990) studied the effectiveness of using a numbers-based mnemonic system on the sight-singing ability of high school singers. Forty-four high school choral students in grades 10-12 were randomly assigned to an experimental group and a control group. All subjects had very little experience in reading music, and for many, it was their first experience participating in a choir. All subjects received tonal training using movable-*do* solfège. Subjects in the experimental group learned a rhythmic-reading vocabulary developed by the researcher. The rhythmic system used numbers to mark the beats and syllables to mark the beat divisions and subdivisions (1, 2-te, 3-ti-te-tah, 4). Subjects in the control group learned rhythms by rote. Data were collected through an individual posttest and an ensemble pretest and posttest. Egbert found no significant differences of posttest scores of subjects in either treatment group ($p > .05$).

Subjects in the experimental group, however, spent less time studying the rhythms on the posttest prior to performance. Egbert indicated that the lack of notable difference between groups possibly resulted from insufficient instructional time devoted to treatment methods and from the small number of participants in the study.

Syllable-Based Systems. A popular syllable-based rhythmic system used in American schools was created by Zoltán Kodály. Kodály used a rich collection of folk songs from his country as the basis for building the child's inner hearing. He believed that rhythm was an outgrowth from these songs in the form of movement, dance, and language. Ascribing to the Pestalozzian ideas of education, Kodály believed that students were not prepared to read notation until inner hearing was developed to its fullest. He used a simplified version of the Galin-Paris-Chavé system to help students verbalize rhythms before exposure to notation (Demorest, 2001). Kodály's rhythmic system used syllable names to represent the time value of a note, including: (a) "tay" for whole notes, (b) "too" for half notes, (c) "ta" for quarter notes, and (d) "ti" for eighth notes.

Another syllable-based rhythmic system used in American schools was designed by Edwin Gordon. In Gordon's system, the syllable "du" represented all macrobeats—the longest beat of equal duration. Gordon used a set of meter-specific syllables to represent the microbeats—a word Gordon used to describe subdivisions: "du-de" and "du-ta-de-ta" for simple meter and "du-da-di" for compound meter (Gordon, 2012). The Kodály approach did not delineate between meters (Colley, 1985).

Like Kodály, Gordon ascribed to the belief that the development of inner hearing was paramount in preparing students to read notation. Gordon coined the term *audiation* to describe the process of inner hearing and used the syllables for macrobeats and microbeats to give rhythm

context for audiation (Gordon, 2012). Gordon's rhythmic system was considered a function-based rhythmic system because there were delineations between macrobeat, microbeat, and meter that did not require prior understanding of rhythmic structure. Bluestine (2000) defined the purpose of the function-based rhythmic system as a mnemonic device designed to build the aural skills of children long before notation is introduced.

Colley (1985) compared the use of three rhythm-reading systems on the rhythmic-reading abilities of second- and third-grade students, including: (a) a word-based rhythmic system, (b) the Kodály rhythmic system, and (c) the Gordon rhythmic system. One hundred and sixty subjects were given a pretest and posttest to measure their ability to recognize, write, and clap twelve rhythmic patterns in two meters: 4/4 and 6/8. Subjects were assigned to three experimental groups and one control group, each receiving eleven weeks of instruction during regularly scheduled music class once a week. Treatments differed only in the syllabic system taught to read rhythmic patterns.

Colley (1985) found that subjects who were taught using the word-based system and the Gordon system performed better than both the subjects taught using the Kodály system and the subjects in the control group. All three systems showed specific strengths and weaknesses in developing one of the three areas investigated, including recognizing rhythmic patterns, clapping rhythmic patterns, and writing rhythmic patterns. For example, subjects who were taught using the word-based system improved in both writing and clapping the rhythmic patterns, but the same subjects often confused words with pronunciations that had similar rhythmic sounds but were assigned to different rhythmic patterns.

A strength of the Gordon system in Colley's (1985) study was the structure of the syllables in terms of metric pulse with consistent subdivisions. Subjects taught using the Gordon

system had no trouble clapping with correct metrical stress and writing rhythmic patterns in either simple or compound meter. Additionally, subjects taught using the Gordon system spent less time decoding rhythms during the posttest than subjects in the other three groups. Despite this extra time, the students in the Gordon-system group did not score as well on the pitch posttest as the students in the control group. Colley (1985) believed that subjects in the Gordon system group did not score high on pitch reading because of the amount of instructional time needed to teach the Gordon syllables. Colley speculated that the difference in posttest results was attributable to other factors, such as student motivation to learn or the experimenter as teacher design of the study. Colley also argued that the effectiveness of the three experimental methods could be attributed to the use of syllables to represent rhythms.

Hoffman, Pelto, and White (1996) designed *Takadimi*, a syllable-based rhythmic system, in response to music-reading deficiencies of their college instrumental students. Hoffman, Pelto, and White committed to developing an effective function-based rhythmic system that nurtured the skills needed for successful music-reading ability at any level of music education and provided "a strong foundation for musicians [to] practice their art well into the twenty-first century" (Hoffman et al., 1996, p. 7). Karpinski (2000) celebrated Takadimi as a system that not only fulfilled the goals of the sound-before-sight approach but adapted well in all rhythms, meters, and types of music.

Takadimi featured two sets of rhythmic syllables, one for simple meter and one for compound meter. Syllables were assigned by location of the note within the beat and not by the notational value of the beat. The macrobeat was always "ta", regardless of meter. Similar to Gordon's rhythmic system, the syllables for the divisions and subdivisions of the macrobeat were distinct for simple and compound meter. These syllables indicated the placement of the

microbeat within the macrobeat. In simple meter, the syllables for macrobeat divisions were "ta-di" and the syllables for subdivisions were "ta-ka-di-mi." In compound meter, the syllables for macrobeat divisions were "ta-ki-da" and for subdivisions, the syllables were "ta-va-ki-di-da-ma" (Hoffman et al., 1996).

Bader (2014) investigated the effect of teaching Takadimi on high school choral singers' sight-singing achievement. The eight-week study involved instruction and weekly testing during regularly scheduled choir rehearsals of two choirs—Choir X and Choir Y. The subjects in Choir X were taught to read rhythms using Takadimi, and were taught to sing folk songs using solfège. The subjects in Choir Y learned the same folk songs as Choir X, but learned the pitches and rhythms by imitating the vocal demonstrations of their teacher. Subjects in Choir X learned to sight sing both pitches and rhythms successfully and demonstrated greater retention of melodies than subjects in Choir Y. Subjects in Choir Y showed no improvement in sight-singing ability and required multiple repetitions of melodies to retain or memorize the folk songs.

Fust (2006) studied the effects of Takadimi and counting on the rhythmic-reading abilities of four sixth-grade band students. All subjects received instruction in face-to-face lessons with the researcher. Identical rhythmic material was taught to all students. Two students were taught using the Takadimi system to read rhythms and two students were taught using the McHose & Tibbs counting system to read rhythms (e.g., 1-e-&-a). Lessons were video tape recorded, and the researcher maintained a log of observations and reflections for each lesson. Fust observed that the subjects in the Takadimi group learned the syllables quickly, were eager to use the syllables rather than return to the counting system learned in band class. Additionally, Takadimi subjects successfully and accurately read all rhythms in the study. Fust found that students who were taught to read rhythms using the Takadimi system were more proficient in

playing rhythms and were less hesitant their performances than subjects who were taught using the counting system.

Tonal Instruction

Unlike an instrumentalist, the singer does not have a specific key to press to produce a tone symbolized on a music score. Dettwiler (1989) described the steps singers must complete to sing music at sight, including: (a) interpret the music symbol; (b) form a cognitive inner image of the sound; then (c) reproduce that sound accurately through manipulation of the vocal mechanism. Frey-Clark (2017) believed that a challenge for the vocalist, as opposed to the instrumentalist, was the need for tonal referents to experience cognitive images of notation. For centuries, singers have used mnemonic aids to help form these referents to sight sing tonal material (Demorest, 2001; Mishra, 2014b)

Solmization Systems. Solfège has been found to be the most popular solmization systems used by high school choral educators to teach students to read pitch (Demorest, 2004; Farenga, 2013; Floyd & Bradley, 2006; May, 1993; Sanders, 2015; Smith, 1998; Snider, 2007; White, 2009). In the western music tradition, solmization systems were divided into two categories—fixed-*do* and movable-*do*. In the fixed-*do* solmization systems, syllables did not change, and the pitch "C" remained *do* in any key. The movable-*do* system was based on tonal function and was characterized by syllables that change according to tonality. In the key of C major, *do* was "C" but in the key of G major, *do* was "G." In minor keys, the movable-*do* solmization system was used in two ways—*do*-based minor or *la*-based minor. Other solmization systems included singing pitches on: (a) scale degree numbers (1, 2, 3), (b) pitch letter names (A, B, C), (c) neutral syllables (e.g., "bum" or "loo"), and (d) interval names (Demorest, 2004; Johnson, 1987). Students taught to sight sing on pitch names used a fixed system since the letter

of the pitch never changed. Students taught to sight sing on scale degree numbers used a movable system since scale degree numbers changed as the key changed (Frey-Clark, 2017).

Debates concerning the merits of a tonal system, particularly movable-*do* and fixed-*do* solmization system, have been a source of controversy among music educators for many years. Siler (1956) believed that the fixed-*do* system was superior to the movable-*do* system. A few years later, Bentley (1959) contradicted Siler's opinion by asserting that the movable-*do* system was the most effective solmization system to teach sight singing, particularly for those students without instrumental experience. Middleton (1984) argued that fixed-*do* was the easiest of all systems to teach accuracy of pitch, tonal memory, and notational understanding. Gordon (2012) argued that fixed tonal systems ignored the importance and need for audiation. These types of debates between music educators, including discussions of the effectiveness of *la*-based minor or *do*-based minor, have continued for many years (Antinone, 2000; Brown, 2001; Holmes, 2009; Hung, 2012; More, 1985; Multer, 1978; Surace, 1978). The debates inspired large amounts of research into the tonal system preference of high school choral music educators (Demorest, 2004; Farenga, 2013; Floyd & Bradley, 2006; Kuehne, 2007; May, 1993; McClung, 2001; Nichols, 2012; Smith, 1998) and the effectiveness of one system over the other at the high school level (Demorest & May, 1995; Henry & Demorest, 1994). Justus (1974) believed that the method of tonal instruction was not a significant factor in the sight-singing ability of the high school singer. Justus (1974) wrote that "tt matters little what crutch is used so long as it enables the student to envision key relationships and interval patterns and does not create problems for reading rhythms" (p. 12).

Results from surveys of American choral directors revealed a predominant preference for the movable-*do* system (Demorest, 2004; Farenga, 2013; Floyd & Bradley, 2006; Kuehne, 2007;

May, 1993; McClung, 2001; Myers, 2008; Nichols, 2012; Potter, 2015; Smith, 1998). In a broad national survey involving 45 of the 50 states in the United States, Demorest (2004) found that 64% of teachers surveyed favored the movable-*do* system for reading pitch, with 70% of those teachers using l*a*-based minor rather than *do*-based minor. A survey of Arizona high school chorus teachers (Farenga, 2003) and Texas high school chorus teachers (May, 1993) yielded similar results with the system of choice being the movable-*do* system with *la*-based minor. May (1993) concluded that all beginning choral music educators should be familiar with the movable-*do* with *la*-based minor system . Smith (1998) found that the most popular tonal solmization systems for Florida high school choral teachers were interval training, neutral syllables, and movable-*do*. In a survey of middle school choral teachers, Kuehne (2007) found that 80% of teachers used the movable-*do* system, with nearly all respondents agreeing with the statement that the movable-*do* system was an effective method to use in sight-singing instruction.

McClung (2001) surveyed a large sample of high school all-state participants ($N = 2115$) across six southern states: Alabama, Arkansas, Georgia, Louisiana, Mississippi, and Tennessee. Participants responded to the following question. “In which sight-singing system have you received the most instruction?” (p. 5) The majority of participants from all states, except Louisiana, answered that they received the most instruction in scale-degree numbers. Participants from Louisiana responded that movable-*do* (49%) and neutral syllables (22%) were the most used systems in their chorus classrooms.

Interested in whether group success in sight singing was indicative of similar individual abilities, Henry and Demorest (1994) investigated the sight-singing ability of students from two Texas high school choirs with outstanding sight-singing ratings in state contests. One choir used the movable-*do* system of sight-singing instruction, and the other choir used the fixed-*do* system.

Participants ($N = 97$) were tested individually. All participants read the same exercise. Before performing the exercise, participants were asked to prepare and read the example as they had been taught in class. An analysis of scores of all participants revealed no significant difference between participants in the movable-*do* group and participants in the fixed-*do* group ($p > .05$). The researchers concluded that both solmization systems were equally effective in developing individual sight-singing skills; however, group sight-singing success was not indicative of individual achievement in sight-singing ability. Henry and Demorest (1994) found that most students used the melodic syllables with which they had been taught at their respective school in sight-singing assessments.

Demorest & May (1995) assessed the individual sight-singing ability of 414 students from four high school choral programs in Texas. All choirs but one received a superior rating in the Texas University Interscholastic League (UIL) sight-singing contest. One choir received an excellent rating—the second highest rating on a 5-point scale. Students in two choirs had been taught using the movable-*do* system. Students in the other two choirs had been taught to use the fixed-*do* system. In individual assessments, participants were told to practice the musical example as they had been taught by their chorus teacher. Results indicated that those subjects taught by the movable-*do* system scored significantly than subjects taught by the fixed-*do* system higher ($p < .05$). While these results seemed to indicate the strength of one system as compared to other system, the researchers described several other differences between the four schools that influenced the results of the sight-singing tests. Among these confounding factors were: (a) the number of participants taking private piano lessons, (b) the practice of regular testing of individual sight-singing at some schools, and (c) the use of the movable-*do* system from kindergarten through high school for participants in two of the schools.

Cassidy (1993) studied the effect of instructional techniques on the sight-singing ability of college-aged non-music majors with little to no experience in reading music. All subjects (N = 91) were enrolled in a course designed to teach music and teaching techniques to non-music education majors. All subjects were administered a pretest to determine music-reading ability prior to instruction. Students were assigned to one control group and four experimental groups. The experimental groups received one of four forms of sight-singing training at each class meeting for a span of 6 weeks, including: (a) echo-singing and sight singing using solfège with hand signs; (b) sight singing using solfège without hand signs; (c) sight singing using the appropriate letter name of the lines and spaces; or (d) sight singing using a neutral syllable of "la." Subjects in all experimental groups improved in sight-singing ability. Subjects taught to sight sing with solfège, with and without hand signs, scored higher than subjects taught to sight sing with letter names and subjects taught to sight sing with a neutral syllable. While all experimental group members exhibited more accuracy on the posttest than those in the control group, the highest mean was earned by subjects who practiced echo singing and sight singing using solfège with solfège hand signs.

Tonal Patterns. Researchers have shown that students with an understanding of harmonic structure are better sight readers (Boyle & Lucas, 1990; Fine et al., 2006; Guibault, 2009; Miller, 2009; Mishra, 2014b). In a meta-analysis of 92 studies on sight reading, Mishra (2014b) found that treatments that focused on an increased understanding of musical structures and were designed to develop expectations while sight reading were the most effective in improving sight-reading ability. Mishra defined music reading as a form of "musical perception and understanding" (p. 146).

Researchers interested in the effect of harmonic structure on sight reading abilities investigated the instruction of tonal patterns based on scale degree and harmonic function (Fine et al., 2006; Grutzmacher, 1987; Henry, 2004; O'Donnell, 2011; Sheldon, 1998). Miller (2009) noted the major contribution of Gordon's music learning theory was the instruction of a musical vocabulary of tonal and rhythmic patterns designed on structural musical syntax through the stages and types of audiation. Goolsby (1994) found that skilled sight singers read patterns, look farther ahead than non-skilled sight singers when reading notation, and refer back to the point of performance throughout the reading. These findings support the use of short tonal patterns for beginning sight singers.

Fine et al. (2006) investigated the effect of pattern recognition and prediction of pitch on the sight-singing ability of young adults. Twenty-two experienced choral singers participated in the study. Each subject performed an unfamiliar Bach Chorale at sight, and read the same chorale with alterations to melody and/or harmony. The researchers found that skilled sight singers recognized melodic patterns, and used their prior experiences with these patterns in performance of unfamiliar music. Less skilled readers relied on auditory cues from harmonic structure, adjusting pitch to fit within the harmonic framework provided regardless of printed notation. Findings from the study emphasized the importance of auditory development in conjunction with music pattern instruction to develop accurate sight-singing ability. The researchers supported the premise that reading music in context of harmonic structure encouraged pattern and contour predictions.

Grutzmacher (1987) investigated the effect of using tonal patterns based on harmonic structure on the sight-reading abilities of beginning instrumental students. Forty-eight elementary students were assigned to an experimental group or to a control group. Subjects in both groups

were taught from the same beginning band textbook and received one 30-minute lesson over a period of 14 weeks. Subjects in the experimental group were taught 10 minor-key and 10 major-key tonal patterns. The patterns were introduced aurally. Subjects sang each pattern before playing the pattern on their instrument, and before seeing the notation of each pattern. Students in the control group were introduced to all tonal material through notation in the textbook without vocalization. Harmonization was restricted to part-writing included in the textbook. Definitions and descriptors, instead of aural presentations, were used to explain the difference between major and minor tunes. A comparison of pretest and posttest scores of subjects revealed a significant difference between the melodic sight-reading scores of the groups ($p < .001$), with subjects in the experimental group scoring significantly higher than subjects in the control group ($p < .05$). Results of this study demonstrated that the sight-reading ability of beginning band students taught to recognize tonal patterns and relationships between pitches in a tonal framework learned to read music more accurately than students taught using the more traditional band methods focused on isolated pitch patterns and technical skills. Grutzmacher concluded that the improved sight-reading skills of the subjects in the experimental group may have resulted in the instructional practices that created a heightened subjects' sense of tonality and tonal imagery skills.

Henry (2004) sought to determine the effect of instruction using pitch patterns based on harmonic function on the sight-singing skills of choral singers. Subjects were members of two beginning women's choirs at the same school. Students in one choir were assigned to Group A: solfège drill ($n = 41$) and students in the other choir were assigned to Group B: familiar melody ($n = 26$). Over a 12-week period, students were given three treatment sessions per week. For the first six weeks of the treatment period, subjects in the control group, Group A, were taught the

targeted pitch patterns using vertical solfège syllables written to correspond to the contour of the melody. Subjects in the experimental group, Group B, reviewed familiar songs that contained one or more of the fifteen targeted pitch skills. Group B subjects were allowed to sing on texts in the initial review of each familiar song but were instructed to perform on solfège in subsequent performances. Familiar songs were presented as standard notation with solfège syllables written by each notehead. During the last six weeks of the treatment period, subjects in each treatment group were taught one of the fifteen pitch skills using solfège during each class period. Subjects in the control group were directed to locate the pitch skill within a multi-measure sight-singing exercise and perform the entire exercise, giving special attention to the targeted pitch skill. Subjects in the experimental group were asked to identify the pitch skill in one of the familiar songs while performing the memorized piece. In addition to sight-singing instruction, all subjects rehearsed the same repertoire. The teacher reinforced the targeted pitch skills in the chosen literature by requiring singers to perform these patterns within the piece on solfège.

Based on Henry's (2004) analyses, posttest scores were significantly higher than pretest scores for both the experimental group ($p < .0005$) and the control group ($p < .015$), with no significant difference between the two groups ($p > .05$). Henry concluded that instruction using targeted pitch skills improved sight-singing abilities. A post-hoc analysis of scores revealed that the greatest gains were exhibited by the singers who scored the lowest on the pretest, leading Henry (2004) to conclude that targeted pitch skills were most effective with the beginning sight singer.

Sight-Singing Instruction Using Movement

> Thinking and learning are not all in our head…it is our movements that not only express knowledge and facilitate greater cognitive function, they actually grow the brain as they increase in complexity. Our entire brain structure is intimately connected to and grown by the movement mechanisms within our body. (Hannaford, 2005, p. 15-16)

Auditory, visual, and kinesthetic activity are three sensory sub-modalities that are especially important in music teaching and learning. Researchers have noted that music teachers tend to emphasize visualization in learning to read music, but stressed that integrating auditory, visual, and kinesthetic processes while teaching and learning music is the most effective way to facilitate desired outcomes of instruction (Anderson, 2012; Reifinger, 2013). New brain imaging techniques have emerged in recent years, facilitating an explosion of research on the mechanisms and functions of the human brain. An area of interest in brain research was the connection between movement and learning. In a review of neuromusical research, Hodges (2000) concluded that "music making is clearly a bodily kinesthetic experience" (p. 21).

Much research on the effect of instruction using movement on music-reading skills has focused on elementary-aged students and on instrumental students (Berger, 1999; Boyle, 1970; Crumpler, 1982; Galvao & Kemp, 1999; Klemish, 1970; Martin, 1991; O'Leary, 2010; Salzberg & Wang, 1989; Searle, 1985; Yang, 1994). In an analysis of experimentally tested sight-reading interventions from 1944 through 2010, Mishra (2014b) found that training in movement did not improve sight reading. Only four of the ninety-two studies analyzed, however, were categorized with a treatment type of "movement." Mishra demonstrated that more research should be conducted on the effect of movement activities on the acquisition of music sight-reading skills. Despite this lack of research on movement in the music classroom, many of the most respected minds in music education—such as Dalcroze, Orff, and Kodály—considered movement an integral part of developing musical perception and understanding (Anderson, 2012; Galvao & Kemp, 1999).

Many of the investigations of the use of kinesthetic activities in the choral rehearsal have centered on vocal production and choral singing (Apfelstadt, 1985; Chagnon, 2001; Daley, 2013;

Grady & Gilliam, 2020; Hibbard, 1994; McCoy, 1986; Wis, 1993). Apfelstadt (1985) addressed using movement to awaken physical energy in warm-ups, to develop a sense of musical flow in rehearsal of repertoire, and to allow singers a chance to internalize musical concepts. Chagnon (2001) found that physical activities in choral rehearsals were a useful teaching tool with choral singers, regardless of their vocal and musical skills. Wis (1993) developed a theoretical foundation for a movement-based choral pedagogy. She concluded that movement encouraged active participation of singers and provided a visible account of the learning that happened in the rehearsal. Although Apfelstadt (1985), Chagnon (2001), and Wis (1993) did not address the use of movement to teach music-reading skills, their conclusions indicated that movement remains a viable instructional tool in the choral classroom.

Despite the lack of research on the effect of movement on the sight-singing ability of singers, surveys of choral educators showed that movement has been used to help students learn to sight sing (Kuenhe, 2007; White, 2009). Kuenhe (2007) investigated the sight-singing instructional practices of middle school choral teachers ($N = 152$). Teachers were asked to rate their agreement with a list of statements regarding their sight-singing instructional practices. The majority of teachers responded positively to the statement "movement activities are very useful." White (2009) found that 69% of high school choral teachers in Kansas used some type of movement in sight-singing instruction. The most popular kinesthetic activities included the use of Curwen/Glover hand signs with movable-*do* solfège and the use of any type of movement to indicate beat.

Solfège hand signs were first created and used by Sarah Glover, then later popularized by John Curwen. The hand signs were used to reinforce tonal function visually and kinesthetically (Frey-Clark, 2017). Kodály encouraged the use of hand signs to reinforce the understanding of

solfège. As the Kodály approach was adopted beyond the borders of Hungary in the 20th Century, his use of hand signs in music instruction also spread. The use of Curwen/Glover hand signs was integrated into American music education in the 1960s (McClung, 2008). Advocates of solfège hand signs have supported their use as a multimodal approach to music reading at all grade levels (Apfelstadt, 1986; Demorest, 2001, Giles, 1991; McClung, 2008, Reifinger, 2013). When used in conjunction with solfège singing, students experience aural, kinesthetic, and visual reinforcement of solmization syllables.

Advantages of using hand signs include a physical indication of student understanding (Demorest, 2001), and a vehicle to communicate pitch information without singing (Reifinger, 2013). Giles (1991) reported that few music teachers used Curwen/Glover hand signs beyond the elementary level. Giles maintained that limiting movement in music learning environments at the secondary level was unfortunate. She felt that using the techniques of Kodály in the upper grades provides a continuation of excellent aural training built at the elementary level. Giles (1991) suggested taking a few minutes to work with hand signs during warm-ups to help build the aural skills of high school singers. Solfège hand signs have often been criticized for adding complexity to the already difficult task of reading notation; however, Demorest (2001) presented the following observation.

> … it is interesting to consider the possible role of hand movement in response to pitch as a means of building musical understanding. It certainly seems to be true for instrumentalists, especially pianists, who can often be seen fingering as they sight-sing or take dictation (p. 42-43)

McClung (2008) examined the effect of the use of solfège hand signs on sight-singing accuracy. Subjects in the study ($N = 38$) were randomly selected from 130 choir members from three different schools. All three schools had earned superior sight-singing scores at choral festivals, and the teachers from these schools exhibited confidence in the positive effects of the

use of hand signs. Teachers in these programs practiced daily sight-singing instruction and required students to use hand signs with movable-*do* solfège syllables while practicing sight-singing drills and while reading repertoire for the class. Subjects were tested while reading two sight-singing examples, one while using hand signs and one without using hand signs. While there was no significant difference when comparing within-subject effect of scores for the two testing modes ($p > .05$), a repeated measures analysis of variance demonstrated a significant difference between test condition scores of students with and without instrumental experience ($p = .03$). The score of subjects with instrumental experience when using hand signs was significantly higher than their score without the use of hand signs ($p = .034$). The score of subjects without instrumental experience when using hand signs was significantly lower than when hand signs were not used ($p = .026$).

Perhaps the most interesting finding of McClung's 2008 study was that when solfège hand signs were eliminated from the testing procedure, both groups of students, with and without instrumental experience, performed at the same level. McClung proposed the existence of a connection between learning mode preference of the student and the use of solfège hand signs. In other words, students who were kinesthetically inclined benefitted most from the use of hand signs while sight singing. McClung suggested that teachers prepare lessons with activities that reflect the unique learning mode of each student.

Killian and Henry (2005) observed strategies used by high school singers prior to an assessment and found that those who used movement performed better than those who did not use movement. Data were collected from students ($N = 200$) attending one of two all-state preparation camps in Texas. Subjects were video recorded sight singing two different melodic examples. For the first example, subjects were given 30 seconds to study and practice the

example before reading it. No preparation time was allowed for the second example. Killian and Henry reviewed the recordings of subjects and created a comprehensive list of behaviors that occurred during the practice time prior to the singing of the first example. Researchers then analyzed each recording for the presence or absence of behaviors on the list, including: (a) pitch strategies (tonicizing); (b) the use of Curwen/Glover hand signs; (c) use of solfège or number syllables, rhythmic strategies (keeping a steady beat in the body); and (d) other overall aspects of subject performance (tempo, starting over, isolating trouble spots). Scores on the individual sight-singing assessments were used to categorize subjects according to sight-singing ability: low-accuracy level, medium-accuracy level, and high-accuracy level. Post-hoc chi-square analysis of video-recorded assessments revealed effective strategies used by subjects during the 30-second practice period and during the performance of the first example. Among the most effective strategies common to both analyses were the use of hand signs and the execution of a physical action to represent the beat.

A high percentage of advanced sight singers in both the Killian and Henry (2005) and McClung (2008) studies had instrumental experience. Both studies also found that hand signs were detrimental to the performance of students who were not skilled sight singers. McClung (2008) concluded that students without an instrumental background may not have the kinesthetic experience necessary to benefit from the hand signs. While the relationship between prior instrumental experience and advanced sight-singing achievement has been found in a number of studies (Casarow, 2002; Daniels, 1986; Demorest & May, 1995, Henry & Demorest, 1994), McClung (2008) cautioned against assuming that only those with instrumental experience would benefit from hand signs.

Researchers have not demonstrated whether Curwen/Glover hand signs assist or interfere with learning. Despite absence of such evidence, Frey-Clark (2017) urged teachers to consider the other pragmatic benefits of hand signs including: (a) solfège hand signs can be used to communicate melodic material without singing; (b) solfège hand signs can be used to perform dictation in instruction; and (c) solfège hand signs can be used to informally assess student learning in the moment. In a review of literature on the use of hand signs, Frey-Clark (2017) stated that the benefits of using hand signs justify their use in the choral music classroom. Consequently, choral music educators "need not fear making the wrong choice concerning the inclusion of solfège hand signs in vocal literacy instruction" (p. 63).

In addition to solfège hand signs, Durocher (2006) researched the effect of a variety of kinesthetic activities on the sight-singing achievement of middle school and high school choral singers. Subjects in the study were choral students from two public high schools and two public middle schools in Arizona ($N = 108$). All subjects were administered a sight-singing pretest and posttest using the Vocal Sight-Reading Inventory (VSRI) designed by Henry (1999). During the treatment period, subjects in the experimental group were given solfège-based sight-singing instruction with a variety of kinesthetic activities to learn rhythmic and melodic material. Subjects in the control group were given solfège-based sight-singing instruction with no movement. For the posttest, subjects in the experimental group were required to use hand signs and solfège. Subjects in the experimental group with previous instrumental experience scored lower on the posttest than they scored on the pretest. Durocher (2006) concluded that students with prior instrumental experience were already successful sight singers whose scores were negatively affected by the requirement of unfamiliar movement techniques in the posttest. Durocher found no significant effect of kinesthetic activities on the sight-singing achievement of

the secondary choral singer ($p > .05$); however, results may have been affected by the lack of training of teachers prior to the study and by the amount of instructional time spent implementing movement with sight-singing instruction.

There was minimal research focused solely on the effect of movement on rhythmic reading. Previous researchers, however, emphasized the importance of kinesthetic activities for music instruction. Henry (2008) and Killian and Henry (2005) found one of the strategies of successful sight singers was maintaining the beat physically on the body. McCoy (1986) found no significant difference in meter discrimination of students who were taught using prescribed movement strategies but suggested that movements to demonstrate pulse and beat subdivisions could enhance student understanding of beat duration ($p > .05$). Several reseachers have shown that physical movements have positive effects on rhythmic reading and musical understanding (Babeau, 1982; Boyle, 1970; O'Leary, 2010). Darazs (1973) believed that notation was only a reminder of the rhythmic experiences that were felt through muscular movement and said that the "right order [to teach rhythm] should be always from kinetic movements to mental conceptualization" (p. 168). The best movements to teach rhythm in choral settings have not been identified, but the importance of using some type of kinesthetic activity to teach students to read rhythm was evident.

Assessment of Sight-Singing Ability

> Rather than guessing what a student knows based on casual observation, the use of effective, time-efficient, and proven assessment methods will provide both teachers and students with the tools to advance in the field (Goss, 2010, p. 100)

McClung (1996) compared responses to a survey of Georgia high school all-state students ($n = 615$), high school choral music educators ($n = 150$), and high school principals ($n = 150$) to determine methods of teaching and attitudes toward grading and assessment practices in the high school performance classroom. McClung (1996) found that students, principals, and

teachers believed that grades should be determined by specific learning objectives. Analysis of the survey responses, however, found that grades for chorus students reflected attendance, participation, and attitude more so than an actual measurement of learning. The finding was corroborated by McCoy (1991) who found the same conclusions in a comparison of grading practices by band teachers with the grading systems proposed by principals. Russell and Austin (2010) investigated the assessment practices of secondary music teachers and found that teachers assign more weight to attendance, participation, and attitude than to other measurable achievement criteria like the ability to read music. McClung (1996) stated that the way students were graded by choral teachers defined "the public's perception of the educational value and status associated with high school choral music as it compare[d] with core academic subjects" (p. 169).

The first National Standards for Music introduced in 1994 emphasized evaluating the learning of individual students (MENC Task Force for National Standards in the Arts, 1994). Standard Five required students to be able to read and notate music. The expectations of the National Standards resulted in an increase in measuring individual achievement in music classes. While Johnson (1987) found that only 27% of teachers assessed student sight-singing achievement, studies after the introduction of the National Standards in 1994 revealed that the majority of high school choral music educators regularly assessed their students' skills in sight singing (Demorest, 2004; Floyd & Bradley, 2006; Goss, 2010; Kotora, 2001; Snider, 2007; White, 2009). After the implementation of the 1994 National Standards, there was an increase in research on the effect of individual testing, and on the most efficient and successful ways to evaluate the sight-singing skills of choral students (Demorest, 1998; Demorest & May, 1995; Henry, 1999; Nolker, 2001; Scott, 1996).

Scott (1996) designed a criterion-referenced sight-singing test based on the top two levels of achievement as established by the National Standards: proficient and advanced. The proficient level of Content Standard Five stated that students "sightread, accurately and expressively, music with a level of difficulty of 3, on a scale of 1 to 6" (MENC Task Force for National Standards in the Arts & Music Educators National Conference (U.S.), 1994, p. 23). The advanced level required that students sight read music of level 4 difficulty on a scale of 1 to 6. The purpose of the study by Scott (1996) was to construct a valid and reliable measurement tool "that accurately [measured] sight-singing performance as delineated by the national standards while incorporating the musical elements of melody, rhythm, harmony, and tonality within a holistic context" (p. iii). Another purpose of the study was to compare the sight-singing ability of high school choral singers with the achievement goals stated in the National Standards.

Subjects in Scott's 1996 study included 120 high school sopranos with varying levels of choral experience from four Illinois high schools. Each subject in the study was tested individually on eight musical examples of choral literature of varying levels. Subjects were required to sing the soprano line of each example while listening to the alto, tenor, and bass parts from a recording produced prior to the assessment. A score of 80% accuracy was required to pass each achievement level. Only 9 of the 120 singers could sight sing music at the proficient level and only one of the singers could sight sing music at the advanced level. Scott (1996) proposed three reasons why students failed to meet the achievement levels of the National Standards, including: (a) threshold of 80% to pass each difficulty level was too high; (b) standards were written to reflect an ideal of music education instead of the reality of what was happening in classrooms; and (c) teachers of students participating in the study were not teaching

students to sight sing independently, or the instructional practices used in the classroom were unsuccessful.

Demorest (1998) used a pretest-posttest control group design to examine the effect of individual testing on the sight-singing abilities of the high school singer. Students (N =306) in two choirs from six high schools participated in the study. The students in one choir from each school were assigned to the control group and the students from the second choir from each school were assigned to the experimental group. All subjects experienced daily sight-singing instruction throughout the semester. Three individual assessments were administered at regular intervals throughout the semester to subjects in the experimental group. One week prior to each of the assessments, subjects were given a sheet of major melodies and were told to practice the examples outside of choir. Scoring was done from tape-recorded performances by two trained evaluators with an inter-evaluator reliability of .97. Subjects in the experimental group experienced significant gain from pre- to posttest (p = .03). Demorest (1998) concluded that individual testing provided evidence of student development and served as motivation for students to practice sight-singing on their own time on a regular basis.

Nolker (2001) investigated the relationship between testing setting and student outcomes on a sight-singing assessment. While Demorest (1998) found the benefit of individual testing, Nolker (2001) argued that accurate assessment results required consistency between the instructional setting and the assessment setting. Sight-singing instruction typically was provided in a group setting, but assessment of sight singing frequently occurred individually, requiring a different setting and different skills. Eight Illinois high school choirs were selected for the study based on their participation in the sight-singing portion of Illinois High School Association (IHSA) large ensemble festival and evidence that the choir director used sight-singing

instructional practices consistent with practices found in previous studies. Selected subjects (N = 220) had been a member of their ensemble for two years with the same director, and had in that time, participated in the IHSA festival. Subjects were assessed in two settings—within the ensemble and in isolation. Within-ensemble testing was performed with the same procedures and instructions of the ensemble sight-singing adjudication at the IHSA festival. Subjects were asked to record their performance on a tape recorder while sight singing music with the group. Subjects were individually tested at the next ensemble rehearsal. Similar to the procedure practiced in the study by Demorest (1998), subjects were placed in a room alone and were recorded sight singing a musical passage. Both assessments were scored by two trained evaluators. An evaluator reliability score of r = .98 was calculated from a subset of the assessments. Scores from the within-ensemble setting were significantly higher than scores from the individual-tested setting ($p < .05$). Nolker (2001) concluded that the within-ensemble testing procedure was a reliable method for gathering information on individual students.

The music contest movement began in the 1920s (Payne, 1997). Johnson (1987) defined contests as "a competition in which performances are evaluated against each other or a standard of excellence for a rating assigned by judges" (p. 10). In response to criticism of the contest emphasis on winning, the events were renamed festivals. At these events, performing ensembles were rated instead of ranked by judges, creating a process where all ensembles were given the chance to receive the highest rating. *Choral contests*, *choral festivals*, *music performance assessments*, and *music performance adjudications* were terms used throughout the country to describe these events. The goal of the Music Performance Adjudications (MPA) in North Carolina was to "provide each performing group with an opportunity to improve and to evaluate

its performance by comparison with a set standard of excellence, and by comparison with the performance of other groups" (North Carolina Music Educators Association, 2021).

Norris (2004) examined the sight-singing requirements of state-sanctioned choral festivals throughout the United States. Norris found that group sight-singing assessment was offered at choral festivals across the country. Assessment of ensemble sight singing, however, was not required and was not included in the overall score of the choir's performance. In many states, sight-singing adjudication materials did not include levels with increasingly difficult musical examples. Norris reported that when difficulty levels were available, teachers were allowed to have their ensemble sight sing at a level that did not match the level of the music prepared and performed for judges.

Researchers have shown that teachers who participate in sight-singing adjudication at choral festivals spend more time on the practice of sight singing in the classroom and are more likely to count sight-singing assessment as a part of a student's chorus grade (Brendell, 1996; Demorest, 2001; Norris, 2004; Snider, 2007). Forty-six percent of Kansas teachers who responded to a survey by Snider (2007) agreed that they would include sight-reading methods in their classrooms if an ensemble rating for sight singing were included in the overall rating at the state's large-group choral festivals. Several researchers cautioned teachers against evaluating the sight-singing ability of individual students based on the group rating awarded at choral festivals, citing that ensemble sight-singing success is not an indicator of individual ability across all choir members (Bennett, 1984; Daniels, 1986; Demorest, 1998; Henry & Demorest, 1994; Middleton, 1984). Bennett (1984) asked the following question. "How many students in a class of thirty-five need to be able to sight-sing a tonal pattern in order for the teacher to hear 'the class' sight-singing? Often, only one" (p. 62).

Surveys of High School Choral Music Educators' Sight-Singing Instructional Practices

The ability to sight sing is a valued outcome of choral music education, but sight-singing teaching methods and approaches are complex and varied. For decades, researchers have surveyed high school choral music educators for the purpose of describing teaching practices as related to sight-singing instruction. Miksza and Elpus (2018) maintained that, through descriptive studies, the music profession generates a knowledge base that informs development of theories, identifies relationships among variables, and lead to future hypotheses to be tested. The following subsections includes a discussion of studies organized roughly by date—from the earliest to the most recent survey studies. The researchers used descriptive research designs to investigate sight-singing instruction, and the subjects surveyed for each study were high school choral music educators.

The Earliest Survey: Hales (1961)

In the earliest survey of high school choral educators on the topic of sight-singing instruction, Hales (1961) studied the practices of high school choral music educators who taught in the states of Utah, Colorado, Montana, Idaho, and Wyoming. In the 1960s, high school music programs were widely accepted as a part of the public-school curriculum but did not demand the respect and "the attention commonly afforded the 'academic' subjects" (Hales, 1961, p. 1). The researcher sought to improve music-reading instruction in high school choral classrooms, and thereby strengthen the argument for the inclusion of choral music education in the official curriculum.

Of the 242 choral music educators who participated in the Hales' 1961 survey, 87% felt that sight singing should be taught to all choral students, and 75% considered themselves to be "good" or "excellent" teachers of sight singing. Half of the respondents regularly devoted time to

sight-singing instruction, and 60% stated that teaching music-reading skills was not a major goal of their instruction. Performance demands and scheduling were cited as the greatest reasons for the exclusion of sight-singing instruction. Sight-singing skills were taught more often to students in non-select choirs as an ability to sight sing was considered a prerequisite for acceptance into the advanced choirs.

A goal of Hales' 1961 study was to identify the most used instructional practices to teach sight singing to high school chorus students, and in so doing, identify those areas of instruction that need improvement. Participants were asked to rate a list of instructional practices that were compiled from literature on choral methodology, from practices of successful choral directors of the time, and from the personal teaching experience of the researcher. The instructional practices were organized into categories for further analysis. Some of the categories included abstract drill, chord study, development of rhythmic sense or pitch discrimination, and tried and true techniques in the elementary classroom. The majority of participants in the study regularly used the piano to teach vocal lines, a practice that Hales called a rote-teaching method that was considered by experts to be one of the least effective sight-singing instructional strategies. Over half of the survey participants (60 %) reported never using Latin syllables, pitch names, or scale degree numbers in their instruction. Of the 90% of choral music educators surveyed who required students to read melody on anything other than the words of the song text, neutral syllables like "loo" and "la" were used most often. Solmization, kinesthetic activity, and aural skill development, techniques that were successful at the elementary level, were seldom used by high school choral music educators who responded to the survey. Hales (1961) concluded that it was "unfortunate that the demand for teaching music is so strongly emphasized in the elementary grades, yet so easily over looked at the high school level" (Hales, 1961, p. 8).

Surveys: 1980-2000

The surveys of Johnson (1987), May (1993), and Smith (1998) provided insights into the sight-singing pedagogical practices of high school choral music educators in the last decades of the twentieth century. Johnson (1987) surveyed high school choral music educators in the north central region of the United States - Nebraska, Iowa, Wisconsin, Minnesota, South Dakota, and North Dakota. May (1993) surveyed high school choral music educators in Texas and Smith (1998) surveyed high school choral music educators in Florida. While Johnson (1987) and May (1993) were most concerned with the pitch-reading methods of teachers, Smith (1998) also surveyed choral music educators on their attitude towards sight-singing instruction and how their college experience prepared them to teach the skill to their students. Johnson (1987) found that over half of participants (56.2%) used sight singing as a qualification in auditions for select ensembles, but most participants (72.7 %) did not include sight-singing evaluation as a part of a student's grade. Similar to Hales (1961), Smith (1998) found that the majority of students enter high school unprepared to sight sing basic choral literature.

The majority of respondents to the surveys of Johnson (1987), May (1993), and Smith (1998) believed that sight singing was an important part of the choral music the curriculum and should be included in daily rehearsals. With the exception of May (1993), instructional time devoted to sight singing did not mirror subjects' beliefs about the importance of sight reading. Smith (1998) found that 82% believed that sight-singing instruction should be included in every rehearsal but only 32% of respondents taught sight singing more than three days a week. May (1993) found that choral music educators devoted a considerable amount of instructional time to reading melodies, and concluded that "melody reading is revealed to be an almost daily activity, and not merely something to review before a contest" (p. 54). Additionally, choral music

educators preferred to use self-composed material for sight-singing instruction, carefully monitoring students and composing exercises based on the needs of their students. Due to the low return rate of May's survey, Smith (1998) argued that May's results should not generalizable to the entire population.

Johnson (1987) asked subjects to report sight-singing instructional time in percentages, rather than in minutes per day and days per week. The researcher felt this format of data collection would account for all scheduling models in Florida schools, including rehearsals that occurred before and after school. Participants in the survey reported 15% of instructional time devoted to sight-singing instruction. Like Hales (1961), high school choral music educators reported that they did not have enough time to teach sight singing because of the pressure to perform. Interestingly, Johnson (1987) found a strongly negative relationship between amount of time spent on sight-singing instruction in the classroom and amount of time spent performing. Johnson suggested that factors other than the pressure to perform could be the reason for the lack of attention to music literacy, such as the lack of chorus educator's training to teach sight-singing.

Johnson (1987) found the interval approach was the most often used method to teach melodic reading. Smith (1998) found interval training using a familiar tune to be the most popular technique used by high school choral music educators, but the most frequently used solmization system was movable-*do* with *la*-based minor. Eighty-two percent of the participants responding to May's (1993) survey used movable-*do* to teach melody reading with 69% using a *la*-based system to teach melodies in a minor key. Only two of the participants responding to May's survey used the interval approach to teach the reading of melody, a dramatic difference

from the number of choral music educators using the interval approach in the Hales (1961) study, a survey completed thirty years prior to May's survey.

Neither Johnson (1987), May (1993), nor Smith (1998) included the systems choral music educators used to teach students to read rhythms. Johnson (1987) believed that reading rhythms in music was an essential part sight singing; however, he chose to focus on melodic reading. Johnson rationalized that pitch reading for singers—unlike instrumentalist—requires internal referents developed through aural skills instruction. May (1993) investigated only the practices used to teach melody reading but suggested future research into the rhythmic teaching preferences of high school choral music educators.

Surveys: 2001-2012

Between the years 2001 and 2012, five researchers surveyed high school choral music educators to determine the state of sight-singing instruction in the choral classroom (Demorest, 2004; Floyd & Bradley, 2006; Snider, 2007; von Kampen, 2003; White, 2009). Von Kampen (2003) investigated the relationship between the attitude of Nebraska high school choral music educators toward sight-singing instruction and five variables: (a) the size of school; (b) the geographic location of the school; (c) the gender of the teacher; (d) the teaching experience of the chorus teacher; and (e) the educational background of the teacher. Demorest's (2004) survey examined the sight-singing instructional practices of middle and high school choral music educators in the United States and Canada. The survey was posted on the website of both the National Association for Music Education (NAfME) and the American Choral Directors Association (ACDA). While 221 participants responded to the survey, the researcher cautioned against generalizing results to all chorus educators since the small number of respondents compared to the number of choral music educators in the United States provided only a glimpse

into what was happening in high school choral classrooms. Further, Demorest noted that those choral music educators around the country who responded to the survey may have done so because of their high interest in sight singing.

Snider (2007) surveyed fifty Kansas high school choral music educators to determine the instructional time, strategies, and materials used to teach choral students to sight sing. The researcher targeted choral music educators for the survey based on the geographic location and size of their school. The majority of participants in Snider's 2007 survey supported sight singing in choral rehearsals but used a small amount of rehearsal time on sight-singing instruction. Moveable-*do* was the most popular solmization system of participants, but many participants taught tonal sight singing using numbers for solmization to teach intervals.

Two researchers during this period of time purposely sought to survey high school choral music educators according to student or ensemble scores on a state-wide sight-singing assessment (Floyd & Bradley, 2006; White, 2009). Floyd and Bradley (2006) included only those choral music educators who scored the highest possible rating at the Kentucky Music Educators Association (KMEA) choral performance evaluation. Their purpose was to identify the prominent teaching strategies of choral educators whose ensembles were successful at sight singing. Successful sight singing was defined as those choirs who received the highest ratings at the KMEA choral performance evaluation. White (2009) examined the relationship between the sight-singing scores of students from a northeast Kansas all-state audition and the self-reported instructional practices of their teachers. Results indicated a significant positive correlation ($p <$ .001) between student score and teacher understanding of the audition process but did not show a relationship between a particular sight-singing method and student sight-singing score on the all-state audition. White (2009) organized answers to an open-ended question concerning movement

in sight-singing instruction into seven categories. The use of solfège hand signs was found to be the most often used kinesthetic activity to teach students to read music. Other movement categories included the use of movement to emphasize steady beats and use of conducting patterns by students while sight singing.

Floyd and Bradley (2006) found that high school choral music educators spend 18% of instructional time on sight-singing instruction, a slightly higher percentage of time than found in Johnson (1987). The length of rehearsals represented in Floyd and Bradley's (2006) study was unclear, and there was large variance between teacher-reported instructional time spent to teach sight singing (*SD* = 7.33). Von Kampen (2003) did not evaluate the specific amount of time spent on sight-singing instruction, but through qualitative data determined that the reasons given most often for not including sight-singing instruction into rehearsals was lack of time to do so. Snider (2007) found that directors spent 1-9 minutes of rehearsal time teaching sight-singing skills. Participants responding to the Demorest (2004) survey spent an average of 9.5 minutes per rehearsal on sight-singing instruction. Demorest found that choral music educators spent equal time in sight-singing instruction for advanced choral groups and beginning choral groups, a conflict with Hales (1961) findings that choral music educators used more instructional time teaching beginning choir members to sight sing than teaching advanced choir members to sight sing. Most participants responding to the White (2009) survey reported an average of 11 minutes per rehearsal spent on sight-singing instruction; however, the participants spent more time on sight-singing instruction in weeks before an all-state audition than in the weeks after the all-state audition. White found that students who practiced sight singing at least once per week or on a daily basis scored higher on the sight-singing portion of an all-state audition than students who practiced only the week before the audition.

High school choral music educators surveyed during this period of time preferred the movable-*do* system to teach melodic reading. Sixty-four percent of choral music educators surveyed by Demorest (2004) preferred the movable-*do* system over all other pitch systems—fixed-*do*, scale degree numbers, and neutral syllables. Demorest also found that of those who taught students to sight sing in a minor key, 47% preferred *la*-based to *do*-based minor. Floyd and Bradley (2006) found that 75% of choral music educators preferred the movable-*do* system to teach melodic sight singing. The researchers found this preference to be an interesting finding since respondents were selected for participation in the study because of the high sight-singing scores of their ensembles at a choral performance evaluation. While movable-*do* was the most popular solmization system used by respondents in the Snider (2007) study, 38% of participants continued to use numbers to teach melodic reading when teaching intervals. White (2009) found the fixed-*do* system was the least used system of high school choral music educators and found that over 75% of choral educators never used the fixed-*do* system. Demorest (2004) argued that the popularity of the movable-*do* system over the fixed-*do* system by high school choral music educators could be a result of the elementary training of beginning chorus students.

The majority of high school choral music educators who participated in the survey studies between 2001 and 2020 preferred counting with numbers to teach students to read rhythms (Demorest, 2004; White, 2009). Demorest (2004) found the use of syllables to teach rhythm to be the second most popular choice—with the syllables "ta-ti-ta" and "ta-ti-to" used more often than neutral syllables and more often than Gordon syllables. Demorest pointed out that while the majority of choral music educators agreed on a pitch-reading system, there was less agreement on the system to read rhythms. White (2009) asked participants to rate their use of four rhythmic systems: counting, "ta-ti-ta", neutral syllables, and single syllables. Eighty-six

percent of participants surveyed reported that they "always" and "often" teach students to use numbers (counting) for reading rhythms. Syllables, including "ta-ti-ta", neutral syllables, and single syllables, were the syllables used least often by respondents. Eighty-two percent of participants reported that they *sometimes* and *never* teach students to use the syllables "ta-ti-ta" for reading rhythms. White found that students who were taught to read rhythms using the "ta-ti-ta" system scored lower than other students on the sight-singing segment of their all-state audition.

From 2001-2012, surveys showed a dramatic increase in the number of high school choral music educators assessing students on their ability to sight sing (Demorest, 2004; Floyd & Bradley, 2006; Snider, 2007; White, 2009). Respondents reported monitoring student growth in sight singing through a combination of formal and informal assessments. Eighty-three percent of participants in the Demorest (2004) survey and 90.1% of participants in the White (2009) survey reported administering some type of sight-singing assessment once per year. In both surveys, almost half of the participants who administered sight-singing assessments reported the use of a formal assessment rather than informal assessments to evaluate students, but few participants used the results of assessments in determining a student's chorus grade. According to Demorest (2004), the attention to assessment and individual progress during this period of time was influenced by the implementation of the 1994 National Standards for Music Education and the increase in the availability of good models for sight-singing assessments.

The Most Recent Survey: Farenga (2013)

In a recent survey of high school choral music educators on sight-singing instruction, Farenga (2013) investigated the attitudes, preferences, and practices of Arizona high school choral music educators. The researcher used a self-designed survey to solicit information

regarding teacher attitudes toward sight-singing instruction, preferences for a specific sight-singing system, and instructional practices in daily rehearsals. The researcher also examined participation and student success in group sight-singing assessments at state choral adjudication events. In 2007, prior to Farenga's study, members of the Arizona Choral Educators (ACE) voted to include group sight singing in the adjudication process at the state high school choral festival. The controversy of that decision was evident in Farenga's survey as only 17% of survey respondents participated in the ACE high school choral festival.

Farenga found that 97% of directors used a sight-singing system. Ten years prior to Farenga's study, von Kampen (2003) found that the majority of high school choral music educators did not use a sight-singing system. Farenga (2013) found the preferred system of pitch reading to be movable-*do* with *la*-based minor and found that choral music educators spent an average of 9.94 minutes per class period teaching students to sight sing. With exception of pitch systems and instructional time allotted for training, there were no other findings concerning specific sight-singing instructional practices.

Farenga (2013) surveyed high school choral music educators concerning their background: (a) length of high school teaching career; (b) educational level; (c) affiliation with professional organizations; and (d) perceived ability to sight sing and to teach sight singing. These variables were collected to determine a relationship, if any, to teacher attitude towards sight-singing instruction, preferences for a specific sight-singing system, or instructional practices in daily rehearsals. Farenga's study revealed that the high school choral music educators of Arizona believed sight-singing instruction to be an important part of the choral rehearsal. Participants with twenty years or more experience spent more time on sight-singing instruction and reported higher levels of agreement with the statement "sight singing is a part of

my choir rehearsal" (p. 97). Farenga posited that less experienced choral music educators committed less time to sight-singing instruction because of the pressure to produce quality performances or because of a lack of understanding of the benefits of sight-singing instruction to the efficiency of rehearsal.

As found in previous studies (Floyd & Bradley, 2006; Kuehne, 2007; Myers, 2008; Potter, 2015; Smith, 1998), Farenga (2013) also found that choral music educators agreed that their coursework and ensemble participation in college did little to prepare them to teach sight singing to high school choral students. In response to an open-ended item concerning college training, a participant in Farenga's (2013) survey stated that: "Knowing what sight singing is and knowing that it's important is one thing. Implementing it successfully is quite another" (Farenga, 2013, p. 84). Many of the subjects participating in the Farenga's survey sought additional professional development opportunities to improve their skills in teaching students to sight sing. The majority of participants (86%) agreed that more professional development sessions on how to teach sight singing were needed in their state, and agreed that such training would be a valuable experience for choral music educators.

Conclusion

The surveys reviewed in this section provided evidence that some evolution in sight-singing instructional practices of high school choral music educators occurred since 1960. Surveys after 1990 showed that choral music educators preferred the movable-*do* system with *la*-based minor for teaching students to sight sing pitches—a contrast to earlier studies that found choral educators preferred to use numbers, interval names, and neutral syllables for pitch reading. The shift in preference of solmization system by choral music educators indicated an evolution of ideas concerning function-based versus theory-based systems. Not all of the surveys

reviewed in this section included inquiries into assessment practices, but of those that did, it was evident that assessment of individual sight-singing progress became more prominent after the implementation of the 1994 National Standards for Music Education. While Johnson (1987) found that 27% of high school choral music educators regularly assessed sight-singing ability, Demorest (2004) reported 83% of high school choral music educators used some type of assessment to measure the progress of individual sight-singing learning.

One characteristic of choral music educators remained constant from the earliest survey on sight-singing instructional practices. Rehearsal time allotted to sight-singing instruction continued to be out of balance with the importance choral music educators placed on the skill. Little rehearsal time and the pressure to perform were reasons given for the lack of time devoted to sight-singing instruction. These reasons were evident in responses to all surveys from the earliest in this review (Hales, 1961) to the most recent (Farenga, 2013).

The purpose of the current study was to provide a contemporary and comprehensive description of the sight-singing instructional practices in the high school choral classroom. Survey items continued the work of previous studies by exploring the use of solmization systems, assessment, and instructional time. Survey items were designed to clarify preference for rhythmic systems and the use of aural and kinesthetic practices by high school choral music educators in sight-singing instruction—activities not thoroughly investigated in previous survey studies. The survey for the current study was administered to high school choral music educators in North Carolina. Except for the 2004 Demorest survey study, all the survey studies in this review focused on high school choral music educators from a certain geographic area. None of the reviewed survey studies were designed to focus specifically on North Carolina high school choral music educators and their sight-singing practices.

CHAPTER III: PROCEDURES

The purpose of this study was to investigate the sight-singing instructional practices of North Carolina high school choral music educators, the attitudes of choral music educators toward sight-singing instruction, and their preferences for sight-singing teaching systems and teaching methods and approaches. The research questions of the study were as follows:

1. What is the prevalence of high school choral music educators' incorporation of sight-singing instruction into rehearsals?
2. What are the prominent sight-singing instructional practices in high school choral rehearsals in the state of North Carolina?
3. What are the attitudes of North Carolina high school choral music educators toward sight-singing instruction?
4. How much time is spent in high school choral rehearsals on sight-singing instruction?
5. What solmization systems are used to develop pitch reading skills among high school choral students?
6. What syllabification systems are used to develop rhythmic reading skills among high school choral students?
7. What aural training strategies are used to develop high school choral students' sight-singing skills?
8. What kinesthetic strategies are used to develop high school choral students' sight-singing skills?
9. What strategies are used to evaluate the sight-singing abilities of high school choral students?

Participants ($N = 127$) were high school choral music educators in North Carolina who responded to the survey of this study, entitled *Survey of Sight-Singing Teaching Methods and Approaches by North Carolina Choral Music Educators*. The survey items were designed to identify the following: (a) prevalence of sight-singing instruction in the North Carolina high school choral programs; (b) attitudes of choral music educators toward the inclusion of sight-

singing instruction in the rehearsal of their choirs; (c) use of different sight-singing systems for tonal and rhythmic reading; and (d) presence of and extent to which aural training strategies, kinesthetic training, and assessment were used in sight-singing instruction.

Participants

The population chosen for this study were choral music educators from North Carolina who brought students to audition for the North Carolina High School Honors Chorus (NCHSHC). The event was sponsored by the High School Choral Section of the North Carolina Music Educators Association (NCMEA). Choral music educators whose students auditioned for the NCHSHC were required to be a member of NCMEA. Auditions occurred over three consecutive days with each day of the auditions held at a different location in North Carolina: Raleigh (East), Greensboro (Central), and Hickory (West), respectively. The sample of the study were participants in the NCHSHC ($N = 127$) who completed the survey while waiting for their students to audition for the event.

Miksza and Elpus (2018) advised that, when conducting survey research in music education, identifying and selecting potential respondents who are knowledgeable of the topic is essential. Since judges for the NCHSHC audition rated the sight-singing ability of each student, it was assumed that choral music educators who registered students for the auditions also prepared their students for the sight-singing portion. Therefore, high school choral music educators who were present at the audition were knowledgeable of and able to comment about sight-singing instructional practices.

Since the purpose of this study was to describe the sight-singing instructional practices used in North Carolina, participants who indicated that they did not incorporate sight-singing instruction in their rehearsals were presented no other items concerning their sight-singing

instructional methods and approaches. Participants who replied that they did not incorporate sight-singing instruction in rehearsals with their high school choirs (n = 2) were asked only items concerning their years of teaching experience, the size of their choral program, and the name of the county in which they teach. Following a response to these initial demographic items, these choral music educators were thanked for their participation in the study and exited the survey. From the total number of high school choral music educators who agreed to take part in the study (N = 127), 125 participants (97.7%) responded that they used sight-singing instruction in their high school choral rehearsals, and consequently, were prompted to complete all survey items designed to investigate their sight-singing instructional practices.

Participant Demographics

In an effort to capture responses from a geographically diverse representation of educators, the survey was administered at all three NCHSHC audition sites. The locations for the auditions were chosen to give wide access to teachers and their students who live in different geographic zones of the state: east, central, and west. Respondents taught in public, charter, and private high schools located in forty-three of the one hundred counties in North Carolina. Wake, Mecklenburg, and Guilford are the most populated counties in North Carolina and as expected, represented the largest pool of participants in this study—Wake County (20.5%), Mecklenburg County (8%), Guilford County (6.3%). The number and overall percentage of respondents from the North Carolina counties represented in the study are displayed in Table 1.

Table 1. Participants by North Carolina County

County	*N*	%
Alamance	1	0.8
Alexander	1	0.8
Burke	1	0.8
Caldwell	1	0.8
Clay	1	0.8
Cumberland	1	0.8
Davie	1	0.8
Duplin	1	0.8
Haywood	1	0.8
Lenoir	1	0.8
Moore	1	0.8
Onslow	1	0.8
Person	1	0.8
Pitt	1	0.8
Rockingham	1	0.8
Stanly	1	0.8
Watauga	1	0.8
Yancey	1	0.8
Cabarrus	2	1.6
Catawba	2	1.6
Cleveland	2	1.6
Harnett	2	1.6
Iredell	2	1.6
Randolph	2	1.6
Rowan	2	1.6
Wilkes	2	1.6
Yadkin	2	1.6
Carteret	3	2.3
Davidson	3	2.3
Johnston	3	2.3
Lincoln	3	2.3
New Hanover	3	2.3
Orange	3	2.3
Surry	3	2.3
Union	3	2.3
Wilson	3	2.3
Durham	4	3.1
Gaston	4	3.1
Forsyth	5	4.0
Buncombe	6	4.8
Guilford	8	6.3
Mecklenburg	11	8.7
Wake	26	20.5
Total	**127**	**100%**

Demographic information was collected from each respondent in the initial items of the survey. The average choral teaching experience in K-12 schools was 14.53 years. The average choral teaching experience at the high school level was 10.7 years. Table 2 shows the number of years respondents worked as a choral director in K-12 schools. Table 3 shows the number of years respondents worked as a choral director at the high school level.

Table 2: Average Years Teaching Chorus

Number of Years	Responses	%
4 or fewer	23	18%
5-9	27	21%
10-14	24	19%
15-19	14	11%
20-24	15	12%
25-29	10	8%
30 or more	14	11%
Total	127	100%

Table 3. Average Years Teaching High School Chorus

Number of Years	Responses	%
4 or fewer	38	30%
5-9	35	27%
10-14	20	16%
15-19	14	11%
20-24	9	7%
25-29	5	4%
30 or more	6	5%
Total	127	100%

Responses to the item concerning longevity revealed that respondents had remained at their current school assignment for an average of 8.3 years, with the majority (70%) having less than 10 years of experience at the same school. Table 4 shows years of experience, as measured by the number of years respondents taught at their current school assignment.

Table 4. Average Years at Current School

Number of Years	Responses	%
4 or fewer	52	41%
5-9	37	29%
10-14	10	8%
15-19	12	9%
20-24	11	9%
25-29	2	2%
30 or more	3	2%
Total	127	100%

The average size of choral programs represented in this study was 101 students. Choral enrollment at each school ranged in size from 4 students to 300 students, with the majority of respondents (73%) teaching between 50 to 149 students per year. Regulations for the 2019 NCHSHC auditions allowed teachers to register up to 15% of their total choral enrollment for the auditions. If the choral program consisted of less than 10 members, teachers were allowed to bring one student to audition. The size of the choral programs of participants—in intervals of 50 students—is displayed in Table 5.

Table 5. Survey Respondents by Size of Choral Program

Number of Students	Responses	%
49 or fewer	18	14.3%
50-99	43	34.1%
100-149	49	38.9%
150-199	10	7.9%
200-249	3	2.4%
250-300	3	2.4%
Total	126*	100.0%

Note: One respondent did not answer this item.

Survey Development and Administration

Consulting literature on questionnaire research (Creswell & Creswell, 2018; Miksza & Elpus, 2018; Patten, 2014) and surveys designed by Demorest (2004), Farenga (2013), Myers (2008), Potter (2015), and White (2009), the researcher designed the survey instrument for this study using an institution subscription to Qualtrics Survey Software. Qualtrics is a web-based software that allows the user to create surveys and generate reports. Surveys and responses are contained in Qualtrics secure servers and are only accessible to the creator of the survey with a user ID and password. Surveys can be shared on a variety of devices including computers, phones, and tablets, and are accessible in multiple browsers: Internet Explorer, Firefox, Safari, and Chrome. With Qualtrics, survey prompts can be positioned into "blocks." Depending on participants' responses, Qualtrics can be programmed to skip a block or connect to another block to collect further information from the respondent.

The survey was divided into seven blocks. In the first block, participants were asked to provide consent. The Consent to Participate was copied from the adult consent form template provided by the Institutional Review Board (IRB) of the University of North Carolina at Greensboro. The consent form was adapted as necessary for this study. The remaining six blocks of the survey were Block 2: Demographics; Block 3: Teacher Attitude; Block 4: Tonal and Rhythmic Systems; Block 5: Aural Training Strategies; Block 6: Kinesthetic Strategies; and Block 7: Assessment.

The advantage of block construction in Qualtrics was that participants completed only items that were pertinent to their instructional practices. For example, if the participant answered "no" to the last question in Block 2: Demographics, "Do you incorporate sight-singing instruction into rehearsal with your high school choir(s)?", the participant was thanked for their

participation in the study and the survey ended. In this way, the participant provided relative data points concerning teaching experience, choral program size, and inclusion of sight-singing instruction without responding to further items about their instructional practices. Participants who answered "yes" to same question continued to Block 3: Teacher Attitude of the survey. Responses to the first item in Block 5: Aural Training Strategies, Block 6: Kinesthetic Strategies, and Block 7: Assessment determined whether survey participants were presented further items in that block or continued to the subsequent block. Potter (2015) used the same block design in a survey of collegiate choral conductors. The block design allowed for a strategic collection of data from only those participants who incorporated specific instructional practices. The block design also decreased the amount of time needed to complete the survey—a feature that was intended to encourage participation in the study.

An outline detailing the methodology of this study was approved by the researcher's committee on April 17th, 2019. The researcher shared the survey draft with committee members and with others well acquainted with survey development. Suggested revisions were made based on feedback that helped improve the flow and content of the items. Modifications were also made to shorten the length of the survey. The final draft of the survey was formatted into Qualtrics and prepared for the pilot study of the instrument.

Pilot Study

Creswell and Creswell (2018) reported that pilot testing of a survey instrument (a) provides an initial evaluation of the internal consistency and validity of items; (b) helps estimate the time needed for respondents to complete the survey; and (c) offers insight that will help to improve questions, format, and instructions to participants. A pilot study of the survey included seventeen former high school choral music educators. All participants of the pilot study had

been, at one time, successful choral music educators who included sight-singing instruction into their daily rehearsals. Pilot study participants were either retired from education, teaching at a university, or living in a state other than North Carolina.

The average amount of time for pilot study participants to complete the survey was 12.7 minutes. Based on responses to open-ended items, "interval training" was added as an aural training strategy and "walking" was added as a kinesthetic activity to lists that would be assigned a frequency rating by participants. After these minor revisions following the pilot study, the researcher applied to the University of North Carolina at Greensboro Institutional Review Board (IRB) Human Subjects Committee for review. The application was approved by the IRB Human Subject Committee (Appendix A).

Survey Administration

With permission of the NCMEA high school section board and the NCHSHC coordinator (Appendix B), the researcher travelled to the three NCHSHC audition sites to administer the survey (Appendix C). Participating choral music educators were required to register their arrival at the audition site. The registration table was set-up by the NCHSHC site host. At the registration table, choral music educators were given a post card with an invitation to participate in the survey. Printed on the postcard was a QR code that linked to the survey. Teachers waited in a large room while their students auditioned for the honor choir. The researcher was stationed in the waiting area—near the registration table—and made available I-pads that could be used to complete the survey in a separate section of the waiting area.

Response Rate

In 2019, students from 161 schools participated in the NCHSHC auditions. The researcher assumed that students from each school were chaperoned by their teacher on the day

of the event. Alternate chaperones are rare as the guidelines for the NCHSHC auditions contain strict guidelines regarding teacher presence at the audition site. In some circumstances, however, the NCHSHC coordinator allows students to be chaperoned by a parent or other non-music teacher or administrator from the school. The NCHSHC staff could not provide evidence of adult chaperone status of students for the 2019 auditions. The researcher assumed that all choral music educators of the 161 schools participating in the event were present at the audition sites, and were offered the opportunity to complete the survey. Of that population, Qualtrics recorded 127 participants who completed the survey. The resulting response rate was calculated as 79%. Miksza and Elpus (2018) considered a response rate of 60% to be the threshold for generalizable data. The total number of schools by region that participated in the NCHSHC auditions, the total number of participants by region who responded to the survey, the percentage of participants at each region who responded to the survey, and the percentage of total participants from that region who responded to the survey are displayed in Table 6.

Table 6. Respondents by Region

Region	Total Schools	Total Participants	% Participants at Audition Site	% Total Participants
East	59	45	76%	35.4%
Central	55	45	82%	35.4%
West	47	37	79%	29.2%
Totals	161	127	*79%	100.0%

**Total response rate of the study.*

Analysis of Survey Responses

A Cronbach's alpha was computed to measure the internal consistency of the survey instrument used for the study. Russell (2018) reported that a Cronbach's alpha was a common measure of reliability and was often used for surveys with multiple items constructed in Likert

scale form. The test was conducted to determine if the scale data collected in the *Survey of Sight-Singing Teaching Methods and Approaches by North Carolina Choral Music Educators* was a reliable measure of responses from high school choral music educators. Prior to computing Cronbach's alpha, the additivity of the model was measured using Tukey's procedure for nonadditivity. An additive model was achieved ($F = 4.34$, $p = .037$). The survey for this study was determined to have high internal consistency ($\alpha = .76$), a level of reliability appropriate for subsequent analysis.

To analyze participants' survey responses and answer the research question of the current study, both descriptive and inferential statistics were used. Initially, the data collected from the survey were summarized and analyzed using Microsoft Excel. The mean, median, and mode of each item were figured using the software, and where appropriate, graphs were designed to aid in the interpretation of Likert-scale data. Further analyses of data were completed after consulting Laerd Statistics (2015a) for the appropriate statistical tests. The chi-square χ^2 goodness-of-fit test (Laerd Statistics, 2015b) was used to determine if there were, if any, statistical differences between observed values and expected values of participants' responses and ratings of attitudinal statements, tonal and rhythmic systems, aural training strategies, kinesthetic activity, and use of assessment in sight-singing instruction. A Cochran Armitage (Armitage, 1955; Cochran, 1954) test of trend was used to determine the relationship between participants' ratings of college preparation and participation in professional development for sight singing. The Spearman Correlation (Spearman, 1904) test was used to determine the relationship between participants' ratings of college preparation, ability to sight sing, and ability to teach sight-singing. The Kruskal-Wallis H (1952) test was used to determine if there were any statistically significant differences between subgroup frequency ratings of aural and kinesthetic activities for sight-

singing instruction. A post hoc test, Dunn's (1964), with Bonferroni adjustment was conducted to interpret pairwise comparisons of subgroup frequency ratings and to define the differences between those groups. A probability of less than or equal to .05 was assumed for establishing significance for all inferential statistical analyses. Results of the data analyses are presented in the Chapter IV to answer the following research questions of this study:

1. What is the prevalence of high school choral music educators' incorporation of sight-singing instruction into rehearsals?
2. What are the prominent sight-singing instructional practices in high school choral rehearsals in the state of North Carolina?
3. What are the attitudes of North Carolina high school choral music educators toward sight-singing instruction?
4. How much time is spent in high school choral rehearsals on sight-singing instruction?
5. What solmization systems are used to develop pitch reading skills among high school choral students?
6. What syllabification systems are used to develop rhythmic reading skills among high school choral students?
7. What aural training strategies are used to develop high school choral students' sight-singing skills?
8. What kinesthetic strategies are used to develop high school choral students' sight-singing skills?
9. What strategies are used to evaluate the sight-singing abilities of high school choral students?

CHAPTER IV: RESULTS

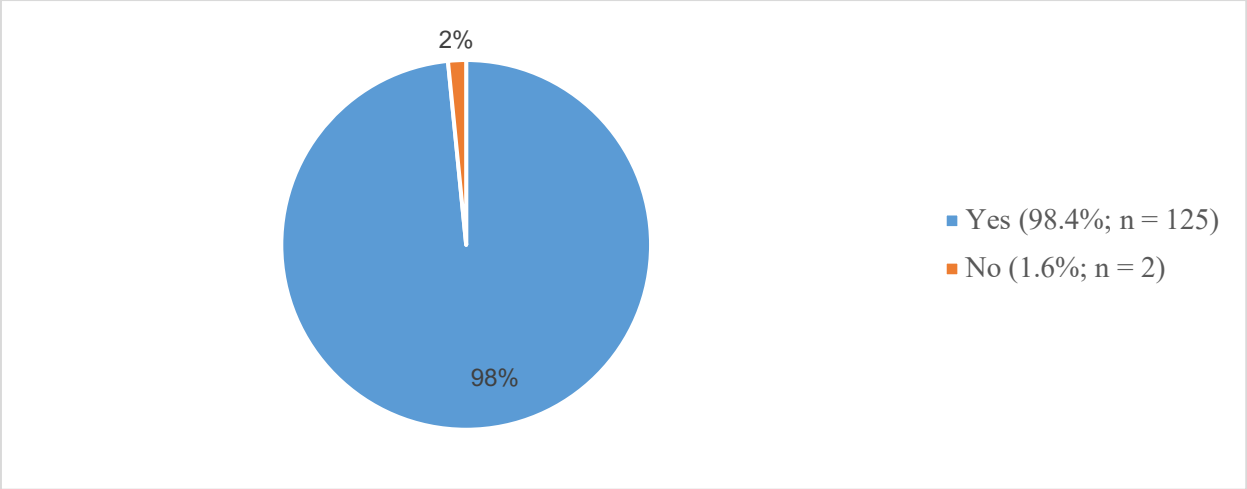
This study was designed to describe the sight-singing instructional practices of high school choral music educators, the attitudes of choral music educators toward sight-singing instruction, and their preferences for sight-singing approaches and methods. Data were collected using a researcher-designed survey administered through Qualtrics Survey Software. The survey was administered to choral music educators at the three North Carolina High School Honors Chorus audition sites. In total, 127 of the high school choral music educators present at the auditions participated in the study, yielding a response rate of 79%. Demographic data were collected from all study participants and is reported in Chapter III of this document. Substantial data were collected from participants who responded that they used sight-singing instruction in their choral rehearsals (n = 125). The data collected from these participants are organized below according to the research questions of the study.

Research Question 1

What is the prevalence of high school choral music educators' incorporation of sight-singing instruction into rehearsals? All high school choral music educators who agreed to participate in the study (N = 127) responded to five initial survey items related to demographics. The responses to these items were described in Chapter II of this document. Participants were asked if they used sight-singing instruction in rehearsals with their high school choir(s). Two participants answered that they did not use sight-singing instruction in their rehearsals. Subsequently, these two participants were thanked for their participation in the survey and did not complete the remaining survey items. Participants who indicated that they used sight-singing instruction in rehearsals (n = 125) were prompted to respond to additional items concerning their sight-singing instructional practices. A chi-square goodness of fit test showed that the number of

participants who used sight-singing instruction in their choral rehearsals (98.4%) was significantly greater than those who did not use sight-singing instruction in their choral rehearsals ($x^2 = 119.13$, $df = 1$, $p < .001$). Based on the analysis, it appears that nearly all participants teach sight singing to their choral students. Participants' responses are shown graphically in Figure 1

Figure 1. Incorporation of Sight-Singing Instruction by Participants



N = 127

Research Question 2

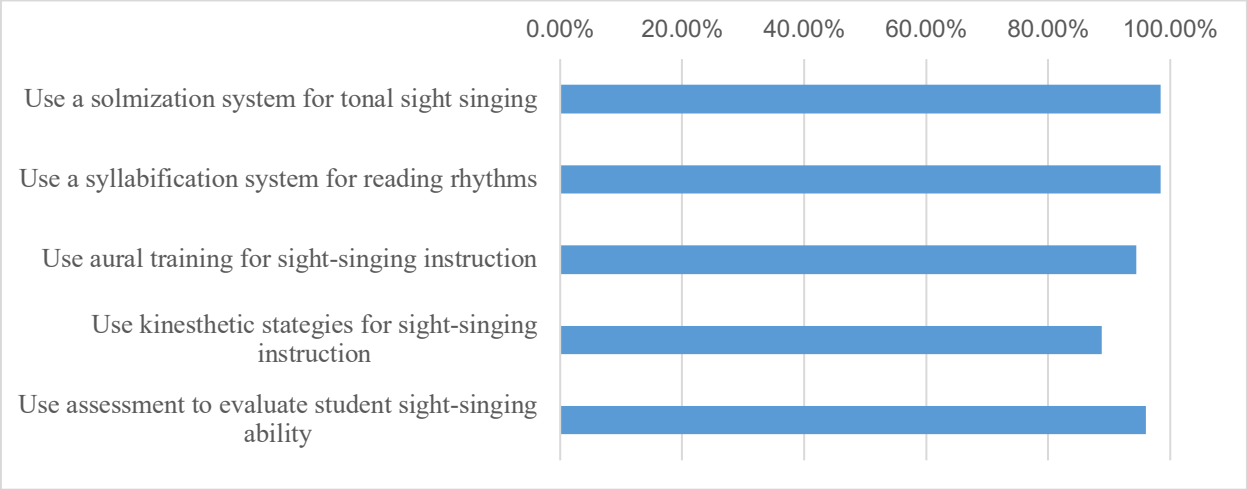
What are the prominent sight-singing instructional practices in high school choral rehearsals in the state of North Carolina? The participants who responded that they used sight-singing instruction in rehearsals (*N* = 125) provided additional information about sight-singing instructional practices used in their choir rehearsals. One participant, who responded affirmatively to providing sight-singing instruction in choral rehearsals, provided no additional information when prompted.

Survey items were designed to investigate participants' uses of tonal solmization, rhythmic syllabification systems, aural training, kinesthetic strategies, and assessment to teach

sight singing in their high school choral rehearsals. Of the participants who reported the use of sight-singing instruction in their high school choral rehearsals, 98.4% (n = 123) use a tonal solmization system and use a rhythmic syllabification system. Ninety-four percent of participants (n = 118) reported that aural training was *sometimes*, *frequently*, or *very frequently* an integral component of their sight-singing instruction. Eighty-eight percent of participants (n = 111) reported using some type of movement *sometimes*, *frequently*, or *very frequently* during their sight-singing instruction. Finally, 96.0% of participants (n = 120) reported individual assessment of student sight-singing abilities *infrequently*, *sometimes*, *frequently*, or *very frequently*.

The current prominent sight-singing instructional practices in high school choral rehearsals are displayed in Figure 2. Further discussion of survey responses to items concerning solmization systems, rhythmic syllabification systems, aural training strategies, kinesthetic strategies, and assessment will be presented later in this chapter.

Figure 2. Sight-Singing Instructional Practices in High School Choral Classrooms



N = 125

Research Question 3

What are the attitudes of North Carolina high school choral music educators toward sight-singing instruction? Participants who used sight-singing instruction in their choral rehearsals were asked to rate their level of agreement with several attitudinal statements in block 3 of the survey. For analysis, these attitudinal statements were organized into three categories: (a) ability ratings; (b) perceived benefits of sight-singing instruction; and (c) sight-singing instructional philosophy. Two additional items, one multiple-choice item and one dichotomous item, provided further data to measure teacher attitudes toward sight-singing instruction.

The first category of attitudinal statements related to the participant rating of their ability to sight sing, their ability to teach sight singing, and the quality of their college preparation to teach sight singing. Data were gathered using a five-point Likert scale rating from 1 (*poor*) to 5 (*superior*). Of the 124 participants who responded to this item, none rated their ability to sight sing as *fair* or *poor*. The mean rating for this item was 4.35 with a standard deviation of .64. The majority of participants (90.3%; $n = 112$) rated their ability to sight sing as *superior* (42.7%; $n = 53$) or *excellent* (47.6%; $n = 59$). While no participants rated their ability to teach sight singing as *poor*, the distribution of ratings for this statement ($\bar{x} = 3.85$; $SD = .69$) were slightly more varied than in the rating of self-reported sight-singing ability ($\bar{x} = 4.35$; $SD = .64$). Data from the final rating statement on college preparation ($\bar{x} = 2.90$; $SD = 1.29$) produced the lowest mean and largest variation of the three ratings. The statement concerning college preparation to teach sight singing was the only attitudinal statement in this section that participants assigned a *poor* rating. The descriptive statistics for each statement in this category are provided in Table 7.

Table 7. Statements Concerning Ability and Preparation

Statement	*M*	*SD*	Rating Scale				
			1 ***n*** **(%)**	**2** ***n*** **(%)**	**3** ***n*** **(%)**	**4** ***n*** **(%)**	**5** ***n*** **(%)**
Ability to sight sing.	4.35	.64	0 (0.0%)	0 (0.0%)	12 (9.7%)	59 (47.6%)	53 (42.7%)
Ability to teach sight singing.	3.85	.69	0 (0.0%)	3 (2.4%)	31 (25.0%)	71 (57.3%)	19 (15.3%)
College preparation to teach sight singing	2.90	1.29	20 (16.1%)	32 (25.8%)	29 (23.4%)	26 (21.0%)	17 (13.7%)

N = 124
Note. Rating Scale: 1 = *poor*; 2 = *fair*; 3 = *good*; 4 = *excellent*; 5 = *superior*

A Spearman rank-order correlation analysis was used to determine if there was a relationship between college preparation to teach sight singing and the ability to teach sight singing. The result of the analysis showed a statistically significant and weak positive correlation ($\rho = .183$; $p = .04$) between the two variables. An additional Spearman rank-order correlation analysis was used to determine if there was a relationship between the ability to sight sing and the ability to teach sight singing. The correlation between the ability to sight sing and the ability to teach sight singing produced a statistically significant and moderate positive correlation ($\rho = .346$; $p < .001$) between the two variables. Based on these results, college preparation to teach sight singing did not appear to contribute notably to participants' beliefs about their abilities to teach sight singing. Participants' beliefs about their ability to sight sing, however, appeared to contribute somewhat to participants' beliefs about their ability to teach sight singing.

The second category of attitudinal statements concerned the perceived benefits of sight-singing instruction. Participants rated their agreement with each statement on a 5-point Likert-type scale from *strongly disagree* (1) to *strongly agree* (5). As previously noted, only those

participants who reported that they used sight-singing instruction in their choral rehearsals (N = 125) were presented additional items in the survey. One participant did not respond to any of the statements in this section; another participant responded to all but one of the statements concerning perceived benefits of sight-singing instruction. All participants (100.0%; n = 124) either *agreed* (12.1%; n = 15) or *strongly agreed* (87.9%; n = 109) in the importance of sight-singing instruction in the chorus rehearsal. The mean rating for this statement was 4.88 with a standard deviation of .33. Most participants (98.4%; n = 122) *agreed* (26.6%; n = 33) or *strongly agreed* (71.8%; n = 89) that choirs who sight sing regularly learn music faster than choirs who do not sight sing regularly ($\bar{x} = 4.69$; SD = .53). Data for the final statement in this category concerning the improvement of ensemble sight-singing instruction with teacher instruction ($\bar{x} = 4.63$; SD = .60) produced the lowest mean and highest standard deviation of all three statements. Based on these results, participants share a high magnitude of agreement for all three attitudinal statements concerning the benefits of sight singing instruction. The total number and percentage of responses to each rating, and the mean ratings and standard deviations of each statement are provided in Table 8.

Table 8. Descriptive Statistics for Responses to Benefits of Sight-Singing Instruction

Statement	*N*	*M*	*SD*	Rating Scale				
				1 ***n*** **(%)**	**2** ***n*** **(%)**	**3** ***n*** **(%)**	**4** ***n*** **(%)**	**5** ***n*** **(%)**
Sight-singing instruction is an important component of the high school choral rehearsal.	124	4.88	.33	0 (0.0%)	0 (0.0%)	0 (0.0%)	15 (12.1%)	109 (87.9%)
Choirs who sight sing regularly learn music faster than choirs who do not.	124	4.69	.53	0 (0.0%)	1 (0.8%)	1 (0.8%)	33 (26.6%)	89 (71.8%)
Sight-singing instruction in my choral rehearsal has improved my ensemble's ability to sight sing.	123	4.63	.60	1 (0.8%)	0 (0.0%)	2 (1.6%)	37 (30.1%)	83 (67.5%)

Note. 1 = *strongly disagree*; 2 = *disagree*; 3 = *neutral*; 4 = *agree*; 5 = *strongly agree*

The third category of attitudinal statements represented beliefs that directly impacted the teacher's design of sight-singing instruction. As in previous attitudinal statement categories, participants rated their agreement with each statement on a 5-point Likert-type scale, ranging from *strongly disagree* (1) to *strongly agree* (5). One participant did not respond to items in this section, and one participant responded to all but one of the statements in this section. Nearly all participants *agreed* (18.5%; *n* = 23) or *strongly agreed* (79%; *n* = 98) in the necessity of sight-singing skills for all choral singers ($\bar{x} = 4.63$; *SD* = .60). Participants did not agree as strongly in the prerequisite of sight-singing ability for selection into an auditioned choir ($\bar{x}$ = 3.88; SD = 1.07) as they agreed on the necessity for sight-singing skills for all choral singers. Nearly all participants *disagreed* (19.4%; *n* = 24) or *strongly disagreed* (77.4%; *n* = 96) that only singers in auditioned choirs should be taught to sight sing. Most participants (36.3%; *n* = 45) *agreed* that repertoire should be selected to reflect the sight-singing abilities of the ensemble, but many

(29.8%; *n* = 37) selected *neutral* for the statement. The mean rating for this statement was 3.40 and the standard deviation was .99. The total number and percentage of participants' selections of each rating, and also the means and standard deviations of each statement are provided in Table 9.

Table 9. Descriptive Statistics of Response to Sight-Singing Instructional Philosophy

Statement	*N*	*M*	*SD*	Rating Scale				
				1 *n* (%)	**2** *n* (%)	**3** *n* (%)	**4** *n* (%)	**5** *n* (%)
Sight singing is an essential skill for all choral singers.	124	4.63	.60	1 (0.8%)	0 (0.0%)	2 (1.6%)	23 (18.5%)	98 (79.0%)
The ability to sight sing should be a prerequisite for singers to join an auditioned choir.	123	3.88	1.07	2 (1.6%)	15 (12.2%)	21 (17.1%)	43 (35.0%)	42 (34.1%)
Repertoire should be selected to reflect the sight-singing abilities of the ensemble.	124	3.40	.99	2 (1.6%)	24 (19.4%)	37 (29.8%)	45 (36.3%)	16 (12.9%)
Only singers in auditioned ensembles should be taught to sight sing.	124	1.29	.66	96 (77.4%)	24 (19.4%)	2 (1.6%)	0 (0.0%)	2 (1.6%)

Note. 1 = *strongly disagree*; 2 = *disagree*; 3 = *neutral*; 4 = *agree*; 5 = *strongly agree*

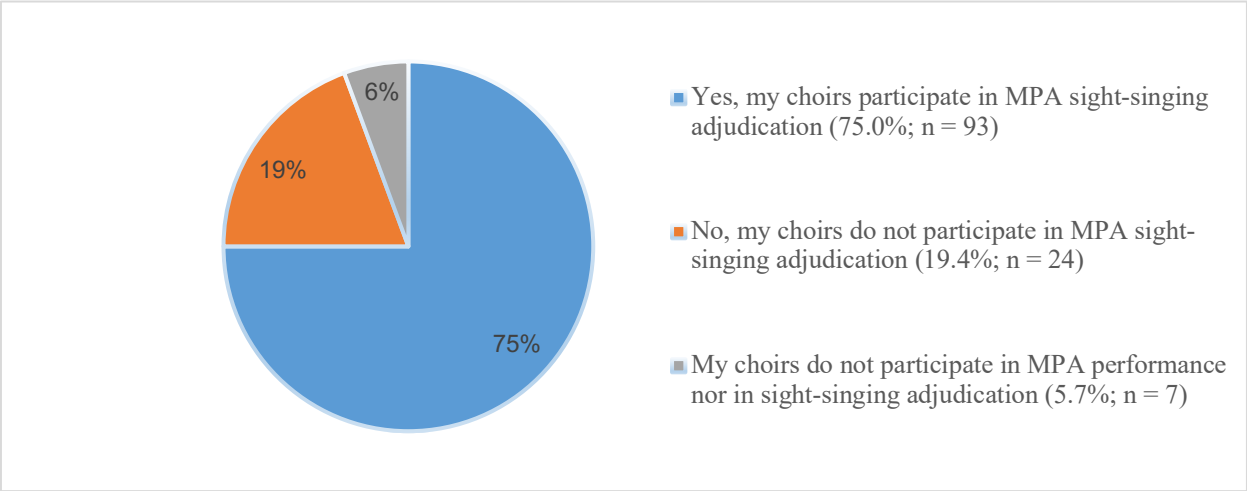
In the final attitudinal items of the survey, two multiple choice items were used to acquire additional information about choral music educators' attitudes toward sight singing. The first item addressed participation in a workshop, presentation, or interest session focused on sight-singing instruction. The second item addressed choir participation in sight-singing adjudication. The majority participants in the study (81.5%; *n* = 101) participated in a sight-singing workshop,

presentation, or interest session in the five years prior to this study. The Cochran-Armitage test of trend was used to determine if there was a linear trend of association between participants' ratings of college preparation to teach sight singing and their decisions to attend a sight-singing workshop, presentation, or interest session during the past five years. Ratings for college preparation to teach sight-singing were *poor* (n = 20), *fair* (n = 32), good (n = 29), *excellent* (n = 26), and *superior* (n = 17), and the percentage of participants who reported attending sight-singing workshop, presentation, or interest session in the last five years were 95.0%, 81.3%, 72.4%, 76.9%, and 88.2% respectively. The Cochran-Armitage test of trend did not show a statistically significant linear trend (p = .447) between ratings of college preparation to teach sight singing and the decision to attend a sight-singing workshop, presentation, or interest session. Based on the result of the analysis, college preparation to teach sight singing does not determine the decision to attend professional development for sight-singing instructional skills.

Participants responded to the following item: "In the past three years, have any of your choirs participated in sight-singing adjudication at the North Carolina Music Educators Association Music Performance Adjudication (NCMEA MPA)?" Participants selected a response to the item with one of the following choices: (a) "Yes, my choirs participated in MPA sight-singing adjudication"; (b) "No, my choirs did not participate in MPA sight-singing adjudication"; or (c) "My choirs do not participate in MPA." Of the 124 participants who responded to this item, the majority (75.0%; n = 93) chose, "Yes, my choirs participate in MPA sight-singing adjudication," and 19.4% (n = 24) chose, "No, my choirs do not participate in MPA sight-singing adjudication." A small percentage of participants (5.7%; n = 7) chose, "My choirs do not participate in MPA." Based on these results, it appears that the majority of participants are choosing to participate in NCMEA MPA. Further, it appears that the majority of participants

who choose to participate in NCMEA MPA are choosing also to participate in sight-singing adjudication at the event. Responses to this survey item are represented in Figure 3.

Figure 3. NCMEA MPA Sight-Singing Adjudication Participation



N = 124

Research Question 4

How much time is spent in high school choral rehearsals on sight-singing instruction?

Three survey items were used to collect data related to instructional time spent on sight singing in high school choral rehearsals. Participants rated their agreement with two statements related to instructional time used for sight-singing instruction on a 5-point Likert-type scale from *strongly disagree* (1) to *strongly agree* (5). Only those participants who reported that they used sight-singing instruction in their choral rehearsals (*N* = 125) were asked to respond to the statements. One participant did not respond to any of the statements in this section and, another participant responded to all but one of the statements in this section. Most participants *agreed* (35.0%; *n* = 43) or *strongly agreed* (54.5%; *n* = 67) that sight-singing instruction should be a part of every rehearsal. The mean of the ratings for this statement was 4.42 and the standard deviation was .72. Fewer participants (30.7%; *n* = 38) *agreed* (23.4%; *n* = 29) or *strongly agreed* (7.3%; *n* = 9) with

the statement that addressed their ability to find enough time to teach sight singing. The mean of the ratings for this statement was 2.65 with a standard deviation of 1.28. From the analysis of the data, it seems that high school choral music educators feel strongly about the necessity of the inclusion of sight-singing instruction in each rehearsal, but many struggle to find the time to do so. The total number and percentage of responses to each rating, and also the mean values and standard deviations of each statement are provided in Table 10.

Table 10. Descriptive Statistics for Responses to Instructional Time

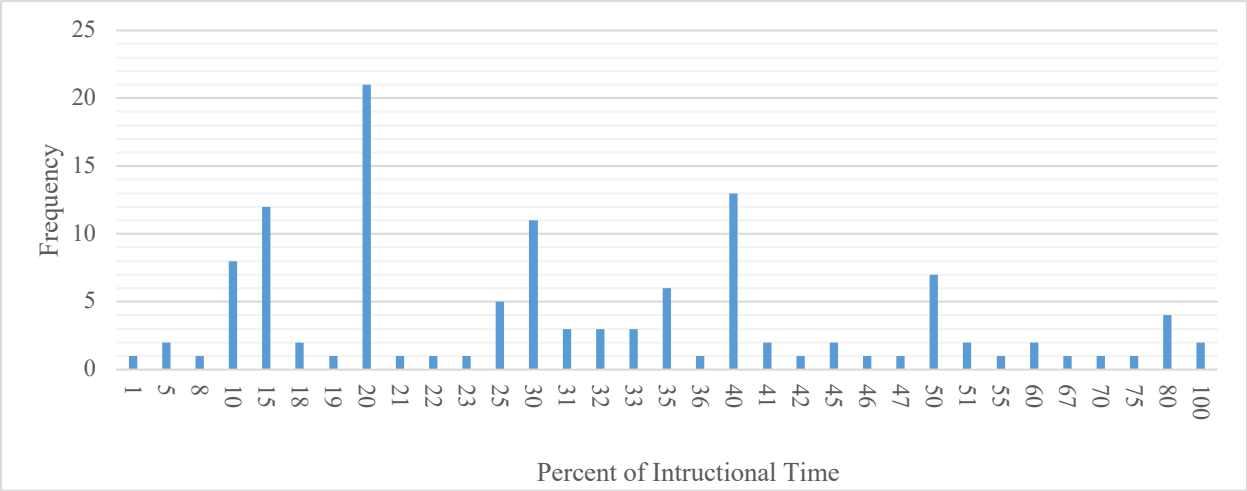
Statement	*N*	*M*	*D*	Rating Scale				
				1 *n* (%)	**2** *n* (%)	**3** *n* (%)	**4** *n* (%)	**5** *n* (%)
Sight-singing instruction should be a part of every rehearsal.	123	4.42	.72	0 (0.0%)	2 (1.6%)	11 (8.9%)	43 (35.0%)	67 (54.5%)
I have difficulty finding enough time to teach sight singing.	124	2.65	1.28	30 (24.2%)	31 (25.0%)	25 (20.2%)	29 (23.4%)	9 (7.3%)

Note. 1 = *strongly disagree*; 2 = *disagree*; 3 = *neutral*; 4 = *agree*; 5 = *strongly agree*

Participants were asked to estimate the average amount of rehearsal time they spent on sight-singing instruction throughout the year. Use of time was defined as any rehearsal time spent singing concert repertoire at sight, singing pitch or rhythmic exercises, or any other activity that involved teaching students to sing music at sight. High school schedules varied across the state, based on North Carolina Local Education Agencies' (LEA) schedule policies. To accommodate for the variety of schedules, participants were asked to specify a percentage of time used to teach sight singing, rather than the number of minutes used for sight-singing instruction. Participants indicated the percentage of time used for sight-singing instruction using a 1 to 100 percentage scale. One participant did not respond to this item. The mean percentage of

instructional time devoted to spent on sight-singing instruction was 32.2% with a standard deviation of 19.0%. Data shown graphically in Figure 4 show all the participants' selections on the percentage scale.

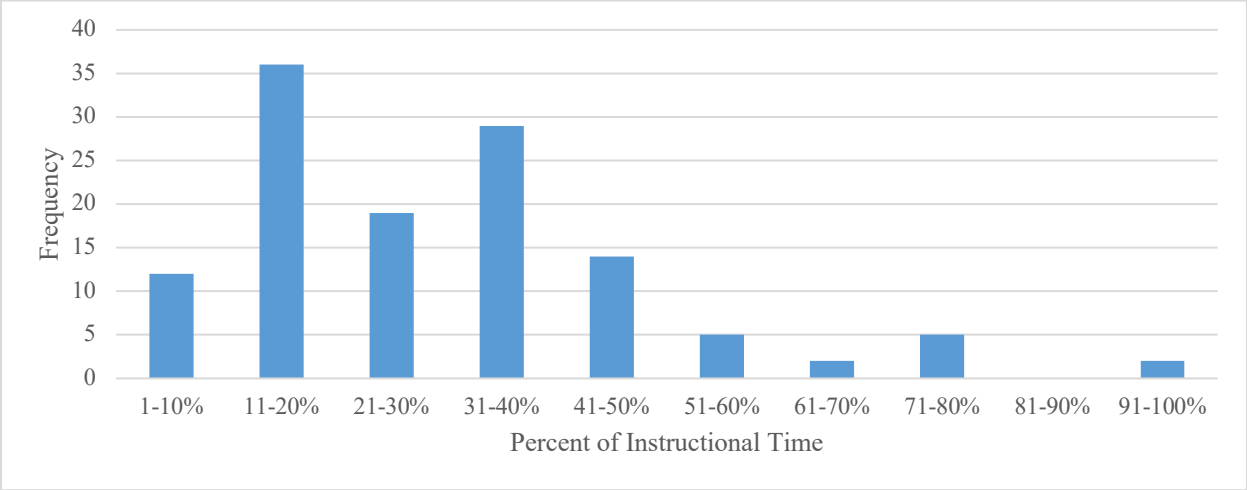
Figure 4. Percentage Time Used for Sight-Singing Instruction



N = 124

The reported percentages of time spent on sight-singing instruction were not continuous because not all percentages of time were selected by participants. For example, no participants selected 6%, 11%, or 24%. To demonstrate a clear understanding of the distribution of these data, participants responses of the percentage of time spent on sight-singing instruction were combined into percentage groups, with each group representing percentages within a 10% range. The grouped percentages are provided in Figure 5.

Figure 5. Grouped Percentage of Time Used for Sight-Singing Instruction



N = 124

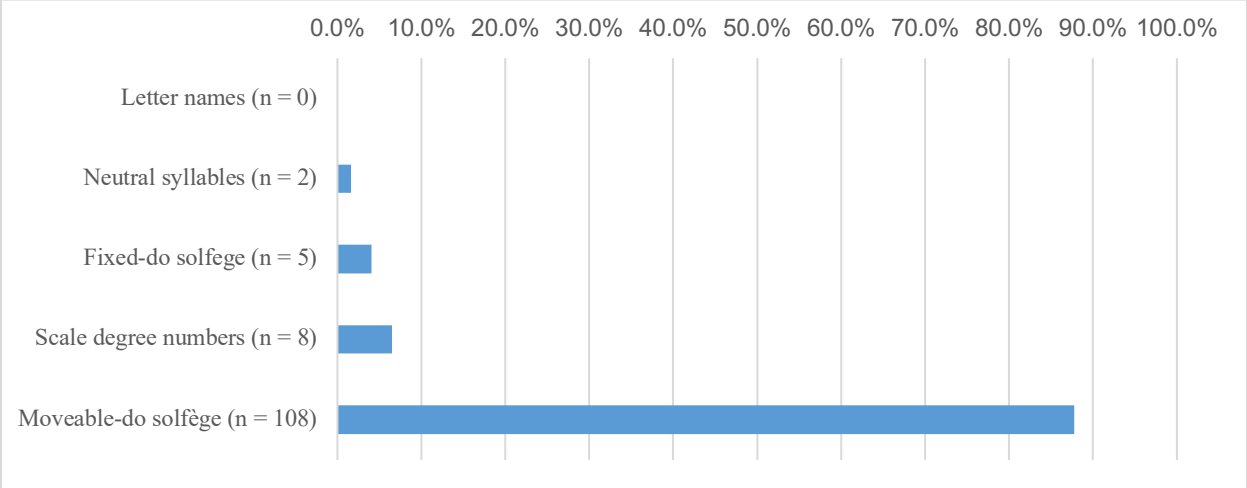
As illustrated in Figure 5, there was an outlier group in the amount of instructional time, with two participants spending 91-100% of their instructional time sight singing. One hundred and seventeen participants devoted between 1% and 70% of their instructional time sight singing. The kurtosis of this distribution of percentages was 2.05, a number that represents a highly skewed distribution of data. Patten (2014) explained that the median represents the most accurate measure of central tendency in highly skewed distributions. In the current study, the median percentage of instructional time devoted to teaching sight singing during rehearsals was 30%. Based on the results of the analysis, the participants in this study spend an average of 30% of rehearsal time on sight-singing instruction.

Research Question 5

What solmization systems are used to develop pitch reading skills among high school choral students? The fourth block of the survey contained items concerning participant use of tonal solmization systems and rhythmic syllabification systems. Participants were asked to indicate the solmization system they used *most often* for major-key, tonal sight singing. Of the

123 study participants who responded to this item, 108 participants (87.8%) indicated that they used movable-*do* solfège for major-key, tonal sight singing. The remaining participants indicated that they used scale degree numbers (n = 8; 6.5%), fixed-*do* solfège (n = 5; 4.1%), and neutral syllables (n = 2; 1.6%). The choice of "letter names" was selected by no participants as the solmization method used to teach major-key, tonal sight singing. "Letter names", therefore, was omitted from the analysis. A chi-square goodness of fit analysis was used to determine the difference between the number of participants' selections across the solmization systems. Analysis of these data demonstrated that a significantly higher number of participants most often used moveable-*do* solfège than those participants who used scale degree numbers, fixed-*do* solfège, and neutral syllables (x^2 = 259.34, df = 3, p < .001). Participants' responses to their use of solmization system are shown graphically in Figure 6.

Figure 6. Solmization Used Most Often for Major-Key Tonal Sight-Singing

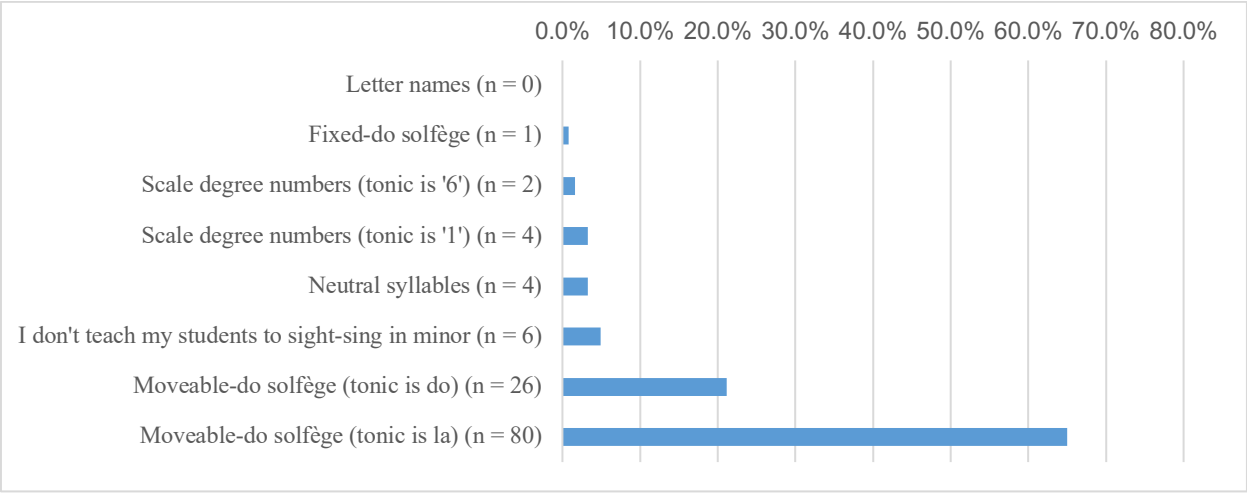


N = 123

Participants also were asked to indicate the solmization systems they used *most often* for minor-key, tonal sight singing. Movable-*do* solfège, with the tonic syllable as *la*, was selected by the majority of participants (65.0%; n = 80) as the tonal solmization system used most often for

minor-key, tonal sight singing. Twenty-six participants (21.2%) selected moveable-*do* solfège, with the tonic syllable as *do,* as the tonal solmization system used most often for minor-key, tonal sight singing. The remaining participants indicated that they used neutral syllables ($n = 4$; 3.3%), scale degree numbers with the number "1" as tonic ($n = 4$; 3.3%), scale degree numbers with the number "6" as tonic ($n = 2$; 1.6%), and fixed-*do* solfège ($n = 1$; .8%). Six participants (4.9%) reported that they did not teach their students to sight sing in a minor key. As with major-key tonal singing, the choice "letter names" was not selected by any of the participants as the solmization method of choice. Consequently, "letter names" was left out of the analysis. A chi-square goodness of fit test was used to determine the difference between the number of participants' selections across the solmization systems. Analysis of these data demonstrated that a significantly higher number of participants most often used movable-*do* solfège with tonic as *la* for sight-singing in a minor key ($x^2 = 283.85$, $df = 6$, $p < .001$). Participants' selections across the seven solmization systems are presented in Figure 7.

Figure 7. Solmization Used Most Often for Minor-Key Tonal Sight-Singing

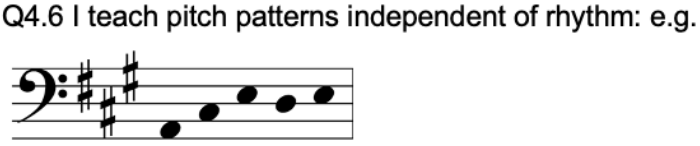


$N = 123$

An additional analysis was conducted between the two most frequently selected solmization systems, including: (a) movable-*do* solfège with tonic as *la* (*n* = 80), and (b) movable-*do* solfège with tonic as *do* (*n* = 26). The chi-square goodness of fit analysis was used to determine if there was a significant difference between the frequency of participants' selections of these two solmization systems. Once again, the chi-square analysis demonstrated significant difference of participants' selections between the two solmization systems (x^2 = 27.5, *df* = 1, *p* < .001) with moveable-*do* solfège/tonic as *la* preferred more than moveable solfège/tonic as *do*. The majority of participants (75.5%) revealed that they most often used movable-*do* solfège with the tonic as *la* for tonal sight singing in a minor key as compared to 25.5% of participants' selection of movable-*do* solfège with tonic as *do*.

To clarify the instructional practices of participants, an additional item concerning tonal reading was included. Participants were asked to rate the frequency for which they taught pitch patterns independent of rhythm. Participants used a 5-point Likert-type scale ranging from *never* (1) to *very frequently* (5) to respond to the item. A picture of note heads on a staff, as shown in Figure 8, was printed below the survey prompt to prevent misunderstanding of the item.

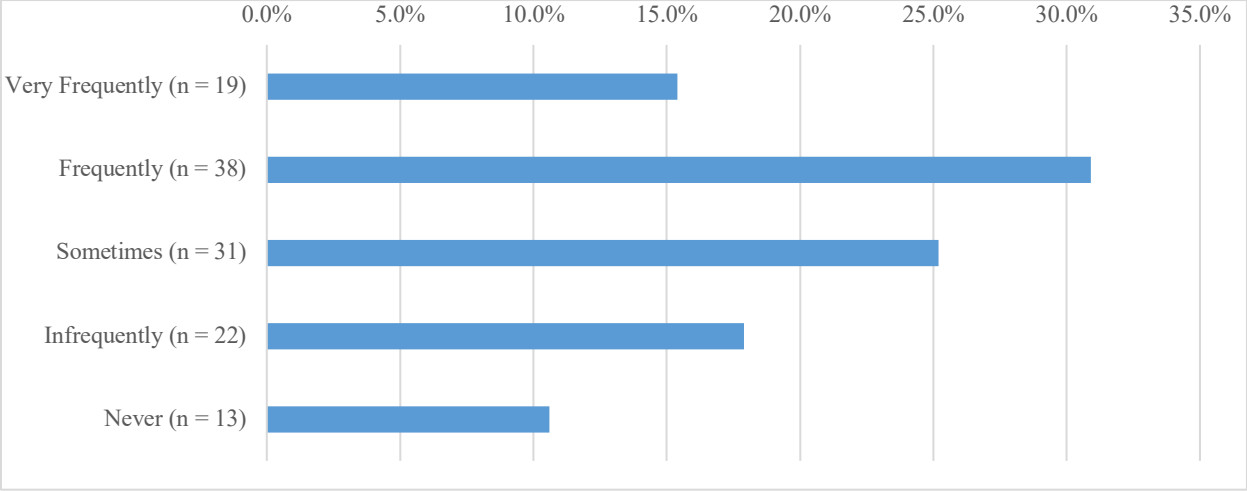
Figure 8: Survey Example of Pitch Patterns Independent of Rhythm



Of the 123 participants who responded to this item, 71.5% of the participants reported that they *sometimes* (*n* = 31; 25.2%), *frequently* (*n* = 38; 30.9%), or *very frequently* (*n* = 19;

15.4%) taught pitch patterns independent of rhythm. The mean of ratings for this item was 3.23 with a standard deviation of 1.22. The chi-square goodness of fit analysis of these data demonstrated that significantly more participants selected *frequently* than the other ratings when indicating if they "taught pitch patterns independent of rhythm" ($x^2 = 15.984$, $df = 4$, $p < .01$). Responses of all participants are provided graphically in Figure 9.

Figure 9. Teach Pitch Independent of Rhythm



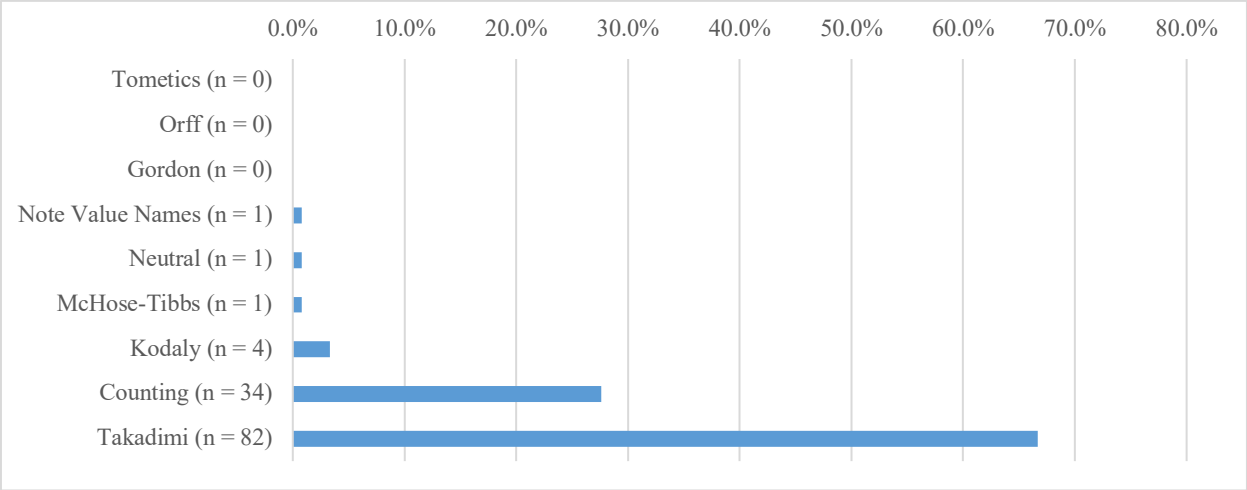
$N = 123$

Research Question 6

What syllabification systems are used to develop rhythmic reading skills among high school choral students? The fifth block of the survey contained items focused on participants' uses of syllabification systems for rhythm. Participants were asked to indicate the system they used *most often* to sight sing rhythms. Of the 123 participants, 82 (66.7%) participants indicated that they most often used the Takadimi system (ta-ka-di-mi, ta-di), and 34 (27.6%) indicated that they most often used the counting system (1-e-&-a, 2-e-&-a). The remaining 7 participants indicated that they most often used the Kodály system ($n = 4$; 3.25%), the McHose Tibbs system ($n = 1$; 0.81%), note value names ($n = 1$; 0.81%), and a neutral syllable ($n = 1$; 0.81%). No

participants selected the Gordon system (du-ta-de-ta, du-de), the Orff system (Al-li-ga-tor, Ap-ple, or other speech cue), or the Tometics system (1-ta-ne-ta, 2-ne). Consequently, these systems were left out of the data analysis using the chi-square goodness of fit test. The chi-square analysis was used to determine if there were significant differences between the number of participants' selections of a syllabification system for rhythm. Analysis of these data demonstrated significantly more participants selected the Takadimi system than any other syllabification systems for rhythm ($x^2 = 262.32$, $df = 5$, $p < .001$). Participants' selections across the nine syllabification systems for rhythm are presented in Figure 10.

Figure 10. Syllabification System for Rhythm Used Most Often



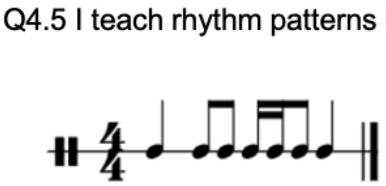
$N = 123$

An additional analysis was conducted between the two syllabification systems for rhythm selected most by participants, including: (a) Takadimi ($n = 82$), and (b) counting ($n = 34$). The chi-square goodness of fit test was used to determine if there was a significant difference between the frequency of participants' selections of these syllabification systems for rhythm. With all other syllabification systems for rhythm removed from the chi-square analysis, except

for Takadimi and counting, once again, Takadimi was selected more frequently than counting (x^2 = 19.9, *df* = 1, *p* < .001).

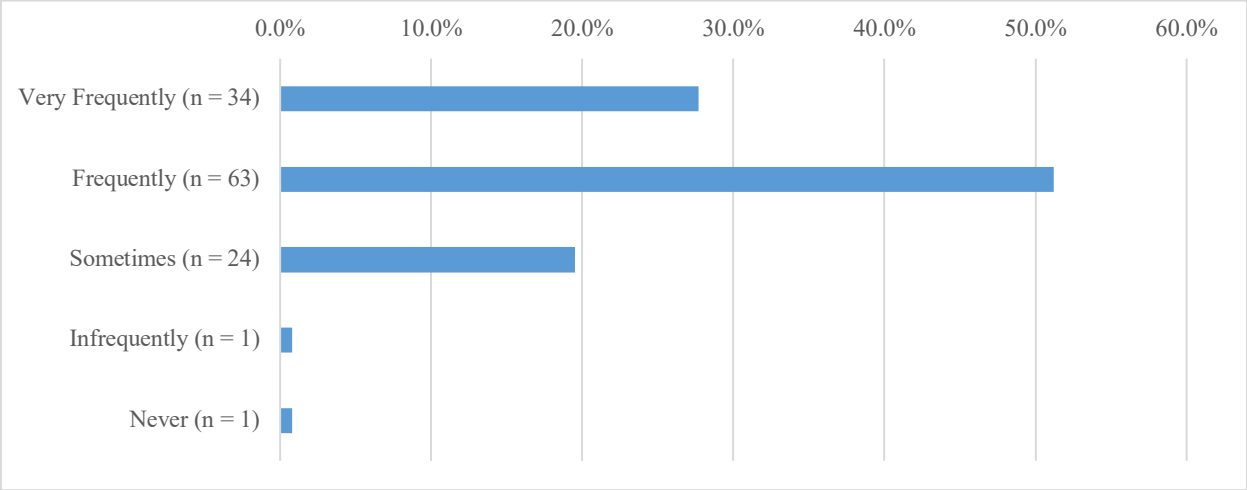
One additional item was designed to clarify how the sight singing of rhythm was taught by the participants. Using a Likert-type 5-point scale from *never* (1) to *very frequently* (5), participants were asked to rate the frequency for which they taught rhythmic patterns independent of pitch. To prevent misunderstanding of the item, a picture of a rhythmic pattern independent of pitch, as shown in Figure 11, was printed beneath the survey prompt.

Figure 11: Survey Example of Rhythmic Pattern Independent of Pitch



Nearly all participants (*n* = 121; 98.3%) responded that they *sometimes* (19.5%, *n* = 24), *frequently* (51.2%, *n* = 63), or *very frequently* (27.6%, *n* = 34) taught rhythmic patterns independent of pitch. One participant selected *never*; and one, selected *infrequently*. The mean of participants' ratings (*n* = 123) was 4.04 with a standard deviation of .64. A chi-square analysis revealed that significantly more participants selected *frequently* than the other rating choices (x^2 = 108.829. *df* = 4, *p* < .001). All participants' responses are shown graphically in Figure 12.

Figure 12. Teach Rhythm Independent of Pitch

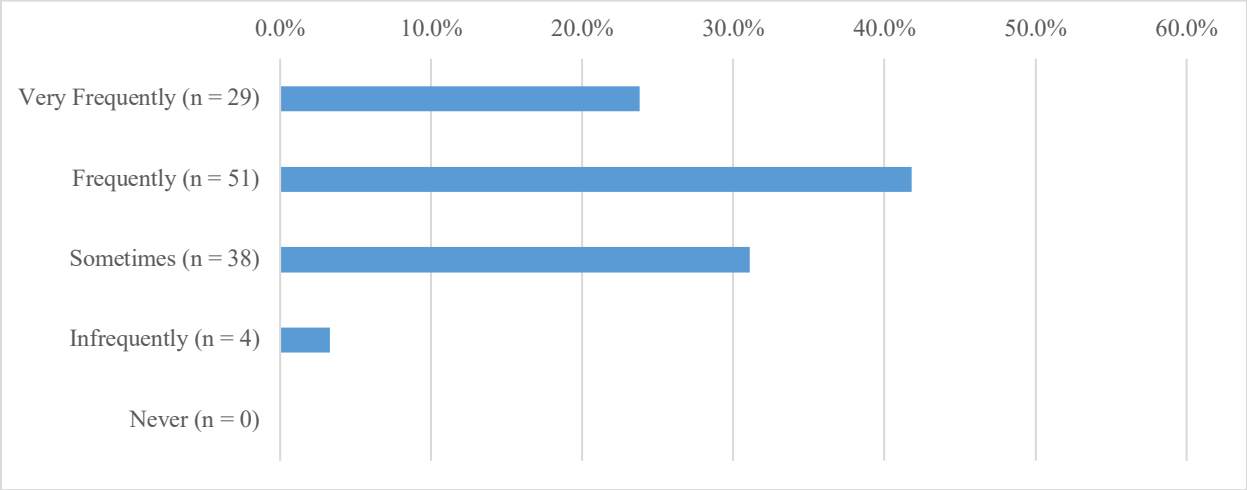


N = 123

Research Question 7

What aural training strategies are used to develop high school choral students' sight-singing skills? Responses to items in the fifth block of the survey related to aural training strategies and were used to answer research question 7. The first item of this survey block asked participants to rate the frequency that aural training served as an integral component of their sight-singing instruction using a 5-point Likert scale from *never* (1) to *very frequently* (5). There were 122 participants who responded to this item, and all reported the use of aural training strategies to teach students how to sight sing ($\bar{x} = 3.86$; *SD* = .82). The largest number of participants (*n* = 51; 41.8%) responded that they *frequently* incorporated aural training strategies in their sight-singing instruction. The chi-square goodness of fit test was used to determine if there was a difference between the number of participants selecting each rating. The analysis demonstrated a significant difference between the number of participants' rating choices, with *frequently* being chosen most often ($x^2 = 38.721$, *df* = 3, $p < .001$). Participants' rating choices are presented graphically in Figure 13.

Figure 13. Use of Aural Training Strategies in Sight-Singing Instruction



N = 122

The survey was designed so that those participants who selected *infrequently* (*n* = 4) or *never* (*n* = 0) to the first survey item of block 5 were presented no further items concerning the use of aural training strategies in sight-singing instruction. Those who reported that they used aural training *sometimes*, *frequently*, or *very frequently* to teach students to sight sing (*N* = 118) were presented further items to clarify their use of aural training strategies in sight-singing instruction.

Participants rated their agreement with two statements related to aural training on a 5-point Likert-type scale from *strongly disagree* (1) to *strongly agree* (5). Most participants (44.1%; *n* = 52) selected *neutral* for the statement: "Students should exhibit mastery in aural skills before reading printed notation." The mean of the ratings for this statement was 3.18 and the standard deviation was .95. Fewer participants *strongly disagreed* (3.4%; *n* = 4), *disagreed* (16.9%; *n* = 20), *agreed* (27.1%; *n* = 32), and *strongly agreed* (8.5%; *n* = 10) with the statement that addressed mastery in aural skills as a prerequisite for reading printed notation. Most participants (46.6%; *n* = 55) selected *disagreed* for the statement: "The principle of 'sound

before sight' applies more to elementary-aged music students than to high-school aged music students." The mean of the ratings for this statement was 2.25 and the standard deviation was .97. Fewer participants selected *neutral* (19.5%; *n* = 23), *agreed* (11.0%; *n* = 13), and *strongly agreed* (1.7%; *n* = 2) for the second statement in this section. The total number and percentage of responses to each rating, and also the mean values and standard deviations of each statement are provided in Table 11.

Table 11. Statements for Aural Training Strategies for Sight-Singing Instruction

Statement	Mean	SD	Rating Scale				
			1 ***n*** **(%)**	**2** ***n*** **(%)**	**3** ***n*** **(%)**	**4** ***n*** **(%)**	**5** ***n*** **(%)**
Students should exhibit mastery in aural skills before reading printed notation.	3.18	.95	4 (3.4%)	20 (16.9%)	52 (44.1%)	32 (27.1%)	10 (8.5%)
The principle of "sound before sight" applies more to elementary-aged music students than to high-school aged music students.	2.25	.97	25 (21.2%)	55 (46.6%)	23 (19.5%)	13 (11.0%)	2 (1.7%)

N = 118.
Note. 1 = *strongly disagree*; 2 = *disagree*; 3 = *neutral*; 4 = *agree*; 5 = *strongly agree*

The chi-square goodness of fit test was used to determine if there was a difference between the participants' ratings for each statement in this section. The chi-square analysis demonstrated that significantly more participants selected *neutral* (*n* = 52) than the other ratings for the statement: "Students should exhibit mastery in aural skills before reading printed notation" (x^2 = 61.831, *df* = 4, $p < .001$). The chi-square analysis demonstrated that significantly more participants selected *disagree* (*n* = 55) than the other ratings for the statement "the principle of 'sound before sight' applies more to elementary-aged music students than to high-

school aged music students" (x^2 = 66.407, *df* = 4, *p* < .001). From the analyses of data for the two statements in this section, it appears that choral music educators feel that the principle of 'sound before sight' applies to high-school aged music students, but do not commit to the idea that students should achieve mastery in aural skills before reading printed notation.

Participants (*N* = 118) were presented a list of aural training strategies and were asked to rate the frequency for which they used each one on a Likert-type scale from *never* (1) to *very frequently* (5). There were seven aural training strategies on the list, including: (a) "listening"; (b) "rote singing"; (c) "imitation of a vocal demonstration"; (d) "imitation of an instrumental demonstration"; (e) "improvisation"; (f) "dictation"; and (g) "interval training." "Imitation of a vocal demonstration" was rated the most frequently used ($\bar{x} = 4.08$, SD = .88) aural training strategy, and "improvisation" was rated the least frequently used aural training strategies ($\bar{x} = 2.42$, SD = .95). No participants selected *never* for the aural training strategies "listening" ($\bar{x}$ = 3.93; *SD* = .83) or "interval training" ($\bar{x}$ = 3.88; *SD* = .86). Two participants (1.7%) selected *never* for "rote singing" ($\bar{x}$ = 3.49; *SD* = .93), and 6 participants (5.1%) selected *never* for "dictation" ($\bar{x}$ = 3.20; *SD* = .99). "Imitation of an instrumental demonstration" ($\bar{x}$ =2.43; *SD* = 1.89) was rated *never* by 22 (18.6%) participants, rated *very frequently* by 4 (3.4%), and produced the largest variation of responses of the entire study. Participants' ratings of all seven aural training strategies are presented in Table 12.

Table 12. Ratings of Aural Training Strategies Used for Sight-Singing Instruction

Activity	Mean	SD	Rating Scale				
			1 *n* (%)	2 *n* (%)	3 *n* (%)	4 *n* (%)	5 *n* (%)
Imitation of a vocal demonstration	4.08	.88	0 (0%)	8 (6.8%)	17 (14.4%)	50 (42.4%)	43 (36.4%)
Listening	3.93	.83	0 (0%)	6 (5.1%)	27 (22.9%)	54 (45.8%)	31 (26.3%)
Interval Training	3.88	.86	0 (0%)	6 (5.1%)	33 (28.0%)	48 (40.7%)	31 (26.3%)
Rote Singing	3.49	.93	2 (1.7%)	12 (10.2%)	48 (40.7%)	38 (32.2%)	18 (15.3%)
Dictation	3.20	.99	6 (5.1%)	18 (15.3%)	52 (44.1%)	30 (25.4%)	12 (10.2%)
Imitation of an instrumental demonstration	2.43	1.89	22 (18.6%)	46 (39.0%)	31 (26.3%)	15 (12.7%)	4 (3.4%)
Improvisation	2.42	.95	16 (13.6%)	55 (46.6%)	34 (28.8%)	8 (6.8%)	5 (4.2%)

N = 118
Note. 1 = *never*; 2 = *infrequently*; 3 = *sometimes*; 4 = *frequently*; 5 = *very frequently*

Three groups were created according to participants' rating of aural training as an integral component of their sight-singing instruction. The three groups were labeled according to participants' rating as follows: (a) Group *S* included those participants who reported that they *sometimes* used aural training in sight-singing instruction (*n* = 38); (b) Group *F* included those participants who reported that they *frequently* used aural training in sight-singing instruction (*n* = 51); and (c) Group *VF* included those participants who reported that they *very frequently* used aural training in sight-singing instruction (*n* = 29).

Means and standard deviations were calculated for participants' ratings of the seven aural training strategies within each group. Participants in Group *S* rated the use of "rote singing" ($\bar{x} =$

3.68; *SD* = .81) higher than for "interval training" ($\bar{x} = 2.89$; *SD* = .89), "dictation" ($\bar{x} = 2.89$; *SD* = .95), "instrumental demonstration" ($\bar{x} = 2.39$; *SD* = .1.10), and "improvisation" ($\bar{x} = 2.16$; *SD* = .96). Participants in Group *F* rated the use of "interval training" ($\bar{x} = 4.34$; *SD* = .77) higher than all other aural training strategies in the list. Although "improvisation" ($\bar{x} = 2.79$; *SD* = 1.08) remained one of the least frequently used aural training strategies for Group *VF*, "improvisation" was rated higher by participants in Group *VF* than "imitation of an instrumental demonstration" ($\bar{x} = 2.28$; *SD* = 1.07). Descriptive statistics for total participants' ratings of aural training strategies (*N* = 118) and for each group participants' ratings are displayed in Table 13. Participants' ratings in Group *S*, Group *F*, and Group *VF* for all seven aural training strategies are displayed in Appendix D.

Table 13. Means and Standard Deviations of Ratings for Aural Training Strategies

Aural Training Strategy	Means and (Standard Deviations) of Group Ratings			
	Total (*N* = 118)	**Group *S* (*n* = 38)**	**Group *F* (*n* = 51)**	**Group *VF* (*n* = 29)**
Imitation of vocal demonstration	4.08 (.88)	3.95 (.77)	4.14 (.89)	4.17 (1.07)
Listening	3.93 (.83)	3.74 (.86)	3.94 (.68)	4.17 (1.00)
Interval Training	3.88 (.86)	2.89 (.89)	3.90 (.76)	4.34 (.77)
Rote Singing	3.49 (.93)	3.68 (.81)	3.20 (.94)	3.76 (.95)
Dictation	3.20 (.99)	2.89 (.95)	3.14 (.94)	3.71 (.96)
Imitation of an instrumental demonstration	2.43 (1.89)	2.39 (1.10)	2.55 (.99)	2.28 (1.07)
Improvisation	2.42 (.95)	2.16 (.96)	2.39 (.92)	2.79 (1.08)

Note: 1 = *never*; 2 = *infrequently*; 3 = *sometimes*; 4 = *frequently*; 5 = *very frequently*

A Kruskal-Wallis H test was used to determine if there were differences between the frequency counts of participants' ratings of each aural training strategy between the three groups: Group *S* (*n* = 38), Group *F* (*n* = 51), and Group *VF* (*n* = 29). Through a visual inspection of the boxplots of group ratings for each aural strategy, it was determined that the distributions of ratings for each strategy were not similar for all groups (Appendix E). In the Kruskal-Wallis H test, mean ranks are used to define differences between groups with dissimilar distribution of ratings. To determine mean ranks of group ratings for each aural training strategy, participants' ratings of each aural training strategy were ranked from lowest rating to highest rating—regardless of group assignment. The ranks obtained for participants in each group were averaged to calculate a group mean rank for each aural training strategy. A Kruskal-Wallis H test was conducted to determine if there were significant differences in the mean ranks between groups for each aural training strategy. Group mean ranks, Kruskal-Wallis *H*-values, and *p*-values are presented in Table 14

Table 14: Kruskal-Wallis H Test Results Across Aural Training Strategy Groups

Aural Training Strategy	Kruskal-Wallis *H*-value (*df* = 2)	*p**	Mean Ranks		
			Group *S* (*n* = 38)	Group *F* (*n* = 51)	Group *VF* (*n* = 29)
Imitation of vocal demonstration	2.753	.252	52.58	61.84	64.45
Listening	5.277	.071	52.11	58.94	70.17
Interval Training	16.539	.000	45.30	59.73	77.71
Rote Singing	8.255	.016	66.24	49.72	67.88
Dictation	13.252	.001	48.03	58.17	76.88
Imitation of an instrumental demonstration	1.887	.389	57.62	63.99	54.07
Improvisation	6.492	.039	51.07	59.18	71.12

*Asymptotic significance

The analyses determined that there was a significant difference in the mean ranks between groups in four aural training strategies: "rote singing" ($H_{(2)} = 8.255$, $p = .016$), "improvisation" ($H_{(2)} = 6.492$, $p = .039$), "dictation" ($H_{(2)} = 13.252$, $p = .001$) and "interval training" ($H_{(2)} = 16.539$, $p < .001$). Post-hoc pairwise comparisons were performed to further define differences between ratings by participants in Group *S,* Group *F,* and Group *VF* for each aural training strategy. A Dunn's (1964) procedure with Bonferroni correction for multiple comparisons was used for these analyses.

The post hoc analyses revealed a statistically significant difference in participants' ratings' for *rote singing* ($p = .047$) between Group *F* (*mean rank* = 49.72) and Group *VF* (*mean rank* = 67.88) groups; a statistically significant difference in participants' ratings for

"improvisation" (p = .033) between Group *S* (*mean rank* = 51.07) and Group *VF* (*mean rank* = 71.12); and a statistically significant difference in participants' ratings for "interval training" (p < .001) between Group *S* (*mean rank* = 45.30) and Group *VF* (*mean rank* = 77.71). There were no other statistically significant differences in participants' ratings between groups for "rote singing", "improvisation", and "interval training." The post hoc analysis revealed two statistically significant differences in participants' ratings for "dictation": (a) between Group *S* (*mean rank* = 51.07) and Group *VF* (*mean rank* = 76.88) (p = .001); and (b) between Group *F* (*mean rank* = 58.17) and Group *VF* (*mean rank* = 76.88) (p = .038).

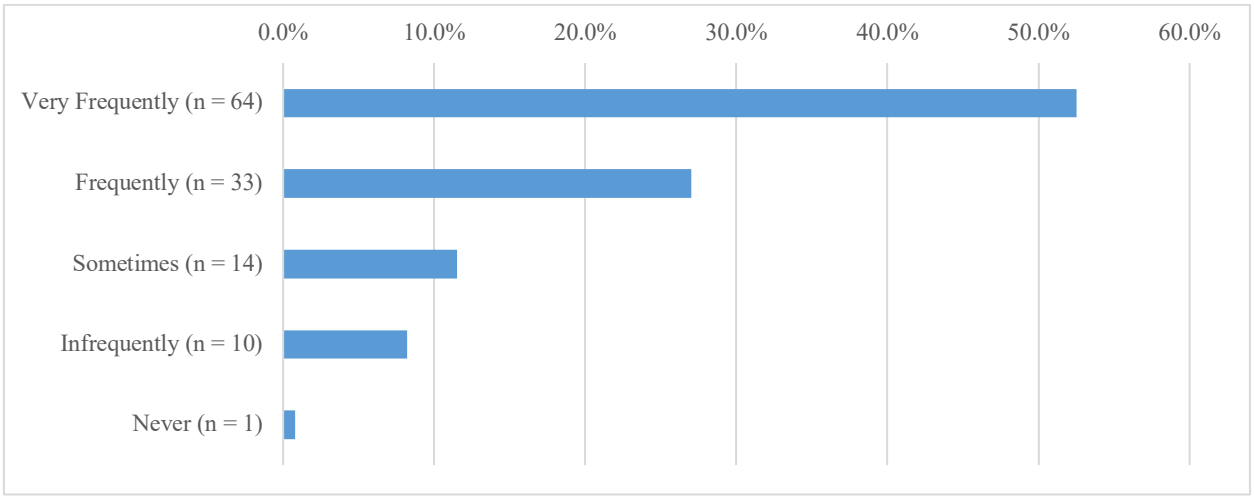
From these analyses, it appears that participants in Group *VF*—those who reported that they *very frequently* use aural training strategies in sight-singing instruction—used "dictation", "interval training", and "improvisation" significantly more often (p < .05) than participants in Group *S*—those who reported that they *sometimes* use aural training strategies in sight-singing instruction. Further, it seems that participants in Group *VF* used "rote singing" and "dictation" significantly more often (p < .05) than participants in Group *F*—those who reported that they *frequently* use aural training strategies in sight-singing instruction.

Participants were asked to list other aural training strategies they used as part of their sight-singing instructional practices that were not listed in the survey ratings list. Thirty-four participants (29%) listed an aural training strategy. Three participants listed "audiation" as an aural training strategy that was practiced in their classroom. The remaining 31 participants' contributions are listed in Appendix F to provide clarity of aural training strategies used in high school choral rehearsals.

Research Question 8

What kinesthetic strategies are used to develop high school choral students' sight-singing skills? Responses to items in the sixth block of the survey related to kinesthetic strategies used for sight-singing instruction and were used to answer research question 8. The first item of this survey block asked participants to rate the frequency that movement was used in their sight-singing instruction using a 5-point Likert scale from *never* (1) to *very frequently* (5). There were 122 participants who responded to the item, and all but one participant (99.2%) reported the use of movement (kinesthetic activity) for sight-singing instruction ($\bar{x}$ = 4.22, *SD* = 1.00). The largest number of participants (52.5%; *n* = 64) responded that they *frequently* used movement in their sight-singing instruction. The chi-square goodness of fit test was used to determine if there was a difference between the number of participants selecting each rating. The analysis demonstrated a significant difference between the number of participants' ratings choices, with the rating *very frequently* chosen most often (x^2 = 102.672, *df* = 4, *p* < .001). Participants' responses are presented graphically in Figure 14.

Figure 14. Use of Kinesthetic Strategies in Sight-Singing Instruction



N = 122
Note. 1 = *never*; 2 = *infrequently*; 3 = *sometimes*; 4 = *frequently*; 5 = *very frequently*

The survey was designed so that those participants who selected *infrequently* (n = 10) or *never* (n = 1) to the first survey item of block 6 were presented no further items in block 6 and proceeded to block 7 of the survey. Those who reported that they used movement *sometimes*, *frequently*, or *very frequently* to teach students to sight sing (N = 111) were presented further items to clarify their use of kinesthetic activities in sight-singing instruction.

Participants (N = 111) were presented a list of kinesthetic strategies and asked to rate the frequency for which they used each one on a Likert-type scale from *never* to *very frequently* (5). There were seven aural training strategies on the list, including: (a) "solfège (Curwen) hand signs; (b) "tracing the contour of the tonal line"; (c) "conducting"; (d) "patsching"; (e) "clapping"; (f) "tapping finger, foot, etc."; and (g) "walking." The most used kinesthetic activity was "solfège (Curwen) hand signs" ($\bar{x}$ = 4.56, SD = .82). The least used kinesthetic activity was "clapping" ($\bar{x}$ = 2.93, SD = 1.33). Participants' ratings of "Patsching" ($\bar{x}$ = 3.54, SD = 1.51) produced the highest variance of all other kinesthetic activities. Participants' ratings of all seven kinesthetic activities are presented in Table 15.

Table 15. Ratings of Kinesthetic Strategies Used for Sight-Singing Instruction

Kinesthetic Activity	Mean	SD	Rating Scale				
			1 *n* (%)	2 *n* (%)	3 *n* (%)	4 *n* (%)	5 *n* (%)
Solfège (Curwen) hand signs	4.56	0.82	2 (1.8%)	2 (1.8%)	5 (4.5%)	25 (22.5%)	77 (69.4%)
Patsching	3.54	1.51	18 (16.2%)	11 (9.9%)	21 (18.9%)	15 (13.5%)	46 (41.4%)
Conducting	3.45	1.08	4 (3.6%)	14 (12.6%)	46 (41.4%)	22 (19.8%)	25 (22.5%)
Tapping finger, foot, etc..	3.35	1.19	9 (8.1%)	18 (16.2%)	29 (26.1%)	35 (31.5%)	20 (18.0%)
Tracing the contour of the tonal line	3.09	1.15	9 (8.1%)	26 (23.4%)	37 (33.3%)	24 (21.6%)	15 (13.5%)
Walking	2.95	1.17	15 (13.5%)	21 (18.9%)	41 (36.9%)	22 (19.8%)	12 (10.8%)
Clapping	2.93	1.33	20 (18.0%)	24 (21.6%)	28 (25.2%)	22 (19.8%)	17 (15.3%)

N = 111
Note. 1 = *never*; 2 = *infrequently*; 3 = *sometimes*; 4 = *frequently*; 5 = *very frequently*

As with aural training strategies, three groups were created according to participants rating of movement during sight-singing instruction. The three groups were labeled according to participants' ratings as follows: (a) Group *S* included those participants who reported that they *sometimes* used movement in sight-singing instruction (*n* = 14); (b) Group *F* included those participants who reported that they *frequently* used movement in sight-singing instruction (*n* = 33); and (c) Group *VF* included those participants who reported that they *very frequently* used movement in sight-singing instruction (*n* = 64).

Means and standard deviations were calculated for participants' ratings of the seven aural training strategies within each group. "Solfège (Curwen) hand signs" was the highest rated

kinesthetic activity in Group *S* ($\bar{x}$ = 3.79, *SD* = 1.19), Group *F* ($\bar{x}$ = 4.39; *SD* = .75), and Group *VF* ($\bar{x}$ = 4.81, *SD* = .61). Participants in Group *VF* rated "patsching" ($\bar{x}$ = 3.92; *SD* = 1.45), "conducting" ($\bar{x}$ = 3.58, SD = 1.11), and "tapping finger, toes, etc." ($\bar{x}$ = 3.36, SD = 1.21) higher than "tracing the contour of the tonal line" ($\bar{x}$ = 3.30, *SD* = 1.27), "walking" ($\bar{x}$ = 3.02, *SD* = 1.21), and "clapping" ($\bar{x}$ = 2.66, *SD* = 1.36). "Conducting" ($\bar{x} = 3.21$; *SD* = 1.12) was the second highest rated kinesthetic activity by participants in Group *S* and "tapping" ($\bar{x} = 3.42$; *SD* = 1.23) was the second highest rated activity by participants in Group *F*. Means and standard deviations for total participants' ratings of kinesthetic strategies (*N* = 118) and for each group participants' ratings are displayed in Table 16. Participants' ratings in Group *S*, Group *F*, and Group *VF* for all seven kinesthetic strategies are listed in Appendix G.

Table 16. Means and Standard Deviations of Ratings for Kinesthetic Strategies

Kinesthetic Activity	**Means and (Standard Deviations) of Group Ratings**			
	Total (*N* = 118)	**Group *S* (*n* = 14)**	**Group *F* (*n* = 33)**	**Group *VF* (*n* = 64)**
Solfège (Curwen) hand signs	4.56 *SD* = .82	3.79 *SD* = 1.19	4.39 *SD* = .75	4.81 *SD* = .61
Patsching	3.54 *SD* = 1.51	2.93 *SD* = 1.21	3.06 *SD* = 1.54	3.92 *SD* = 1.45
Conducting	3.45 *SD* = 1.08	3.21 *SD* = 1.12	3.30 *SD* = 1.02	3.58 *SD* = 1.11
Tapping finger, foot, etc..	3.35 *SD* = 1.19	3.14 *SD* = 1.03	3.42 *SD* = 1.23	3.36 *SD* = 1.21
Tracing the contour of the tonal line	3.09 *SD* = 1.15	2.21 *SD* = .58	3.06 *SD* = .90	3.30 *SD* = 1.27
Walking	2.95 *SD* = 1.17	2.64 *SD* = 1.15	2.97 *SD* = 1.10	3.02 *SD* = 1.21
Clapping	2.93 *SD* = 1.33	3.07 *SD* = .92	3.39 *SD* = 1.30	2.66 *SD* = 1.36

Note. 1 = *never*; 2 = *infrequently*; 3 = *sometimes*; 4 = *frequently*; 5 = *very frequently*

A Kruskal-Wallis H test was used to determine if there were differences in ratings of kinesthetic activities between participants in the three groups: Group *S* (*n* = 14), Group *F* (*n* = 33), and Group *VF* (*n* = 64). A visual inspection of the boxplot of group ratings confirmed that the distribution of ratings was not similar for all groups (Appendix H). Consequently, group mean ranks were calculated for each kinesthetic activity. A Kruskal-Wallis H test was conducted to determine if there were significant differences in the mean ranks between groups for each kinesthetic activity. Group mean ranks, Kruskal-Wallis *H*-values, and p-values are presented in Table 17.

Table 17: Kruskal-Wallis H Test Results for Kinesthetic Activities for Rating Groups

Kinesthetic Activity	**Kruskal-Wallis *H*-value (*df* = 2)**	***p****	**Mean Ranks**		
			Group *S* (*n* = 14)	**Group *F* (*n* = 33)**	**Group *VF* (*n* = 64)**
Solfège (Curwen) hand signs	25.929	.000	31.64	46.80	66.07
Patsching	11.540	.003	41.57	45.76	64.44
Conducting	1.684	.431	48.89	53.09	59.05
Tapping finger, foot, etc..	1.061	.588	48.36	58.50	56.38
Tracing the contour of the tonal line	11.932	.003	30.25	55.33	61.98
Walking	1.384	.501	46.89	56.95	57.50
Clapping	6.926	.031	59.61	67.02	49.53

*Asymptotic significance

The analysis showed that there was a significant difference of mean ranks between groups in four kinesthetic strategies: "Solfège (Curwen) hand signs" ($H_{(2)} = 25.929$, $p < .001$), "patsching" ($H_{(2)} = 11.540$, $p = .003$), "tracing the contour of the tonal line" ($H_{(2)} = 11.932$, $p = .003$), and "clapping" ($H_{(2)} = 6.926$, $p = .031$). To define the differences within groups for these four kinesthetic strategies, a post-hoc comparison was conducted using a Dunn's (1964) procedure with Bonferroni correction for multiple comparisons.

For participants' ratings of "solfège (Curwen) hand signs", the post-hoc analysis showed a statistically significant difference ($p = .002$) between the mean rank of Group *VF* (*mean rank* = 66.07) and Group *F* (*mean rank* = 46.80), and a significant difference ($p < .0001$) between the mean rank of Group *VF* and Group *S* (*mean rank* = 31.64). Further, the analysis showed a significant difference ($p = .014$) between the mean ranks of Group *VF* (*mean rank* = 64.44) and Group *F* (*mean rank* = 45.76) and a significant difference ($p = .035$) between the mean ranks Group *VF* and Group *S* (*mean rank* = 41.57) for "patsching." From these analyses, it appears that those participants who reported that they *very frequently* used kinesthetic activity for sight-singing instruction used solfège hand signs and patsching significantly more frequently ($p < .05$) than those participants who reported that they *sometimes* or *frequently* used kinesthetic activity for sight-singing instruction.

For the kinesthetic activity, "tracing the contour of the tonal line", the mean rank of Group *VF* (*mean rank* = 61.98) was significantly greater ($p = .002$) than the mean rank of Group *S* (mean rank = 30.25), and the mean rank of Group *F* (*mean rank* =55.33) was significantly greater ($p = .035$) than that of Group *S.* Finally, the mean rank of "clapping" for Group *F* (*mean rank* = 67.02) was significantly greater ($p = .029$) than the mean rank of "clapping" for Group *VF* (*mean rank* = 49.53). From these analyses, it appears that those participants who reported that

they *frequently* or *very frequently* used kinesthetic activity for sight-singing instruction used the kinesthetic activity "tracing the contour of the tonal line" significantly more often ($p < .05$) than those participants who reported that they *sometimes* used kinesthetic activity for sight-singing instruction. And, lastly, it appears that participants who reported that they *frequently* used kinesthetic activity for sight-singing instruction used "clapping" significantly more often ($p < .05$) than those who reported that they *very frequently* incorporated kinesthetic activity into sight-singing instruction.

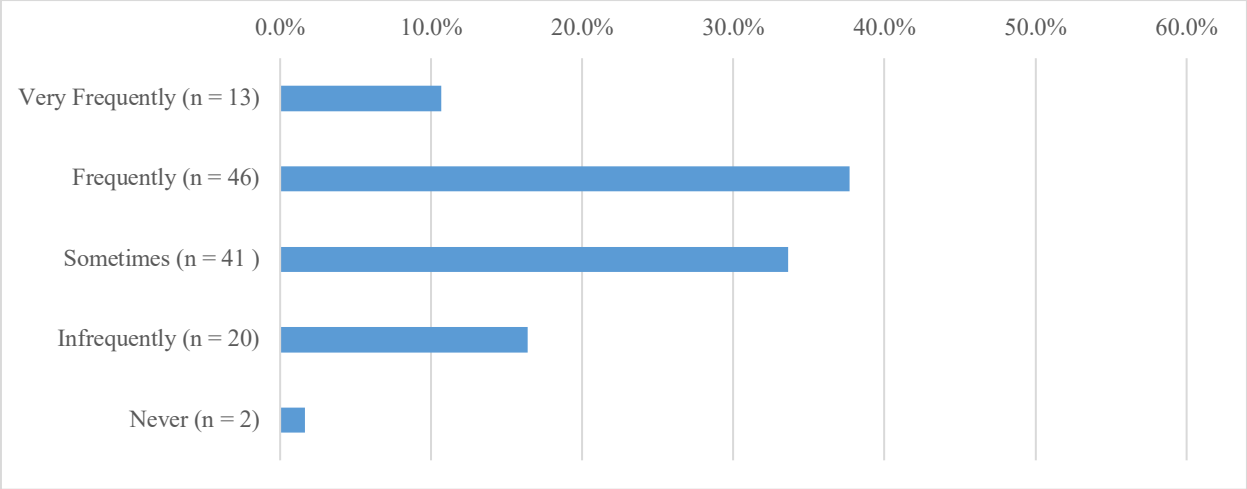
Participants were asked to list other types of kinesthetic strategies they used as a part of their sight-singing instructional practices. Twenty-five participants (23%) listed a kinesthetic activity. Sixteen responses were either very similar to the strategies listed in the ratings list of the survey (i.e. "tapping neighbors shoulder to keep a steady beat") or were activities designed to build vocal technique (i.e. "hand placement to show placement of vowels and tone color"). The remaining ten responses are listed in Appendix I.

Research Question 9

What strategies are used to evaluate the sight-singing abilities of high school choral students? Responses to items in the final block of the survey related to assessment of student sight singing. Data collected in this block were used to answer research question 9. The first item of this survey block asked participants to rate the frequency for which they individually assessed their students' sight-singing ability on a 5-point Likert-type scale from *never* (1) to *very frequently* (5). Of the participants who responded to the initial question concerning the use of assessment ($N = 122$), 120 (98.5%) participants reported that they individually assessed the sight-singing ability of their students at some level of frequency. The mean of participants' ratings was 3.39 and the standard deviation was .94. The largest number of participants (47.7%;

n = 46) responded that they *frequently* assessed their students' sight singing. The chi-square goodness of fit test was used to determine if there was a difference between participants' ratings of this item. The analysis demonstrated a significant difference between the number of participants' ratings choices, with *frequently* being chosen most often ($x^2 = 57.098$, $df = 4$, $p < .001$). Participants' ratings are presented graphically in Figure 15.

Figure 15. Use of Assessment in Sight-Singing Instruction



N = 122
Note. 1 = *never*; 2 = *infrequently*; 3 = *sometimes*; 4 = *frequently*; 5 = *very frequently*

The survey was designed so that those participants who selected *never* (*n* = 2) for the first survey item in the block were presented no further items and were thanked for their participation in the study. Those participants who selected *infrequently*, *sometimes*, *frequently*, and *very frequently* for the first item in the block (*N* = 120) were presented further items to clarify their use of assessment in sight-singing instruction.

Participants (*N* = 120) were presented a list of assessment settings and were asked to rate the frequency for which they used each one on a Likert-type scaled from *never* to *very frequently* (5). There were six assessment settings on the list, including: (a) "alone—performed live for the

teacher"; (b) "alone—recorded in isolation"; (c) "alone—performed in whole group setting"; (d) "in small groups—performed live for the teacher"; (e) "in small groups—recorded in isolation"; and (f) "in small groups—recorded in whole group setting. The most frequently used assessment settings were "alone – recorded in isolation" ($\bar{x}$ = 4.56, *SD* = .82) and "in small groups performed live for the teacher" ($\bar{x}$ = 3.19; *SD* = 1.18). The least frequently used settings were "in small groups—recorded in isolation" ($\bar{x}$ = 1.95; *SD* = 1.14) and "in small groups—recorded in whole group setting" ($\bar{x}$ = 2.10; *SD* = 1.19). Participants' ratings of the assessment settings are presented in Table 18.

Table 18. Ratings for Settings Used for Sight-Singing Assessments

Assessment Setting	Mean	SD	Rating Scale				
			1 ***n*** **(%)**	**2** ***n*** **(%)**	**3** ***n*** **(%)**	**4** ***n*** **(%)**	**5** ***n*** **(%)**
In small groups—performed live for the teacher	3.19	1.18	16 (13.3%)	11 (9.2%)	42 (35.0%)	36 (30.0%)	15 (12.5%)
Alone—recorded in isolation	2.81	1.33	30 (25.0%)	14 (11.7%)	40 (33.3%)	21 (17.5%)	15 (12.5%)
Alone—performed live for the teacher	2.70	.95	13 (10.8%)	35 (29.2%)	50 (41.7%)	19 (15.8%)	3 (2.5%)
Alone—performed in whole group setting	2.34	1.18	40 (33.3%)	24 (20.0%)	36 (30.0%)	15 (12.5%)	5 (4.2%)
In small groups—recorded in whole group setting	2.10	1.19	51 (42.5%)	27 (22.5%)	28 (23.3%)	7 (5.8%)	7 (5.8%)
In small groups—recorded in isolation	1.95	1.14	58 (48.3%)	28 (23.3%)	20 (16.7%)	10 (8.3%)	4 (3.3%)

N = 120
Note. 1 = *never*; 2 = *infrequently*; 3 = *sometimes*; 4 = *frequently*; 5 = *very frequently*

Participants were asked to list other assessment procedures they used to individually assess their students' sight singing. Twenty-eight participants (23%) listed an assessment procedure. Nine participants wrote that they assessed their students "as a group" or "as a whole class." The way in which individual students were assessed in the suggested formats was unclear, although one respondent stated that they assessed students by "watching them and walking around the room to hear." Two participants stated that their students sight sing alone in front of the entire class. Eight participants listed ways in which they collected sight-singing samples from their students. These collection formats included video and three online applications: Sightreadingfactory.com, Smart Music, and Flipgrid. The sight-singing assessment procedures of the remaining participants are listed in Appendix J.

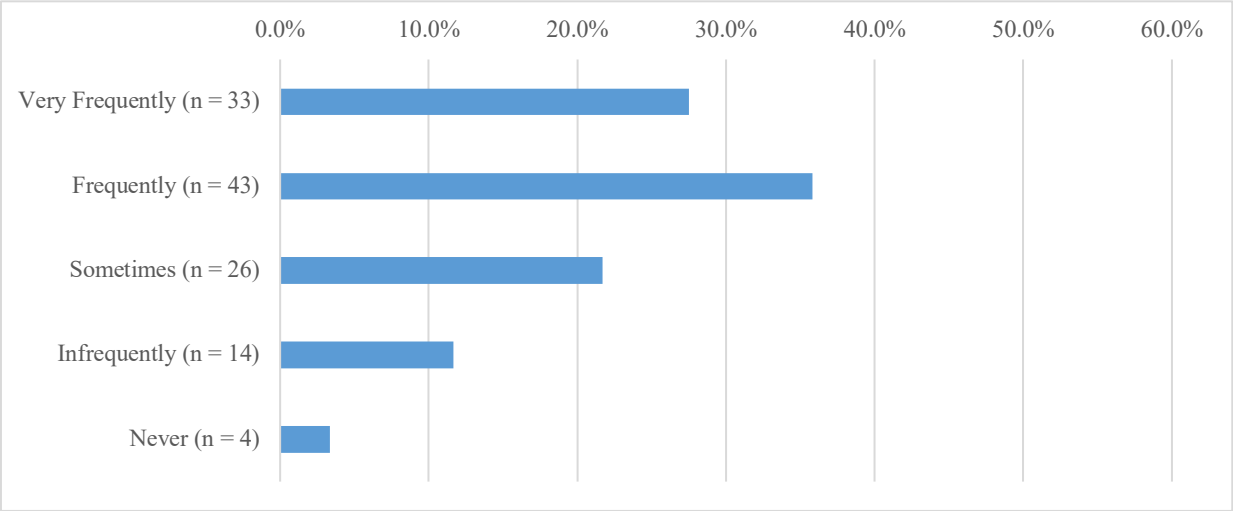
Participants were asked to list the number of times during the school year they assessed their student's ability to sight sing—both formally and informally. Ninety-seven participants (80%) responded to this open-ended item. Some responded with a specific number of assessments per school year. Others responded with words or an explanation of the frequency of assessments. An analysis for those who responded with a specific number of times they assessed their students (n = 72) produced a mean of 35.31, a median of 19, and a mode of 36. Number of assessments ranged from 1 to 180. A high standard deviation of 47.84, a kertosis value of 4.42, and a skewness value of 2.29 demonstrated the multi-peaked and highly skewed nature of responses to this item. The participants who responded with words that were difficult to numerate or with explanations of the frequency of assessments (n = 25) are listed in Appendix K.

For the final item of this block, participants were asked to rate the frequency for which the assessments administered were figured into their students' final grade in high school chorus. The frequency ratings were presented as a 5-point Likert-type scale from *never* (1) to *very*

frequently (5). The mean of the responses was 3.73 with a standard deviation of 1.09. The majority of participants (63.3%; *n* = 76) selected *frequently* (35.8%; *n* = 43) or *very frequently* (27.5%; *n* = 33) for this item. The chi-square goodness of fit test was used to determine if there was a difference between the number of participants selecting each rating. The analysis demonstrated a significant difference between the number of participants' ratings, with *frequently* being chosen most often ($x^2 = 39.417$, *df* = 4, $p < .001$). From this analysis, it appears that the majority of participants use sight-singing assessments and grades from these assessments are used in the calculation of students' final grades in chorus.

The chi-square goodness of fit analysis was used to determine if there was significant difference between the two most frequently selected ratings of *frequently* (35.8%; *n* = 43) and *very frequently* (27.5%; *n* = 33) for this item. The analysis demonstrated no significant difference between participants' choices of the two ratings ($x^2 = 1.316$, *df* = 1, $p = .251$). From this analysis, it appears that the majority of participants (63.3%; *n* = 76) include the grade for sight-singing assessments in a student's final chorus grade. Participants' ratings are presented graphically in Figure 16.

Figure 16. Inclusion of Sight-Singing Assessments in Student Final Grade



N = 120.
Note. 1 = *never*; 2 = *infrequently*; 3 = *sometimes*; 4 = *frequently*; 5 = *very frequently*

Summary of Results

The majority of high school choral music educators (98.4%) in the state of North Carolina who participated in this study reported that they use sight-singing instruction in rehearsals with their high school choirs. Among the participants who teach sight singing to high school choral students, there was a significant preference ($p < .05$) for: (a) the moveable-*do* solfège system for major-key, tonal sight singing; (b) the moveable-*do* solfège system for minor-key, tonal sight singing; and (c) the Takadimi system for rhythmic sight singing. The majority of participants (78.9%) reported that they *frequently* or *very frequently* separate rhythms from pitches for sight-singing instruction, and nearly half of participants (46.3%) reported that they *frequently* or *very frequently* separate pitches from rhythms for sight-singing instruction. Participants responded that they spend an average of 30% of rehearsal time on sight-singing instruction.

Of the participants who reported the use of sight-singing instruction in rehearsals with their high school choirs, nearly all participants (94.4%) used aural training strategies *sometimes*, *frequently*, or *very frequently* to teach sight singing to their students. The most frequently used aural training strategy was "imitation of a vocal demonstration", and the least used the aural training strategy was "improvisation." Although the majority of participants used aural strategies in their sight-singing instruction, 44.1% were ambivalent to the need for mastery in aural skills before the introduction of printed notation. Of the participants who reported the use of sight-singing instruction in rehearsals with their high school choirs, the majority (88.8%) used kinesthetic strategies *sometimes*, *frequently*, or *very frequently* to teach sight singing to their students. *Solfège (Curwen) hand signs* and *patsching* were the most used kinesthetic activities for sight-singing instruction. Nearly all participants (96.0%) assessed student sight-singing ability at some regularity throughout the school year.

Participants agreed that sight-singing instruction was an important component of the high school choral rehearsal, and also agreed that a benefit of sight-singing instruction was the increased efficiency of learning repertoire. Participants believed that sight singing is a skill important to all choral singers, and that sight-singing instruction should not be reserved for only students in auditioned choirs. The importance of sight-singing instruction by participants was evidenced by their voluntary participation in the sight-singing adjudications of the NCMEA MPA, and in the interest in professional development to improve sight-singing instruction.

CHAPTER V: SUMMARY AND CONCLUSIONS

The purpose of this study was to describe the sight-singing instructional practices of high school choral music educators in the state of North Carolina. In addition to investigating rehearsal time used for sight-singing instruction and exploring teacher attitudes toward sight-singing instruction, the study was designed to investigate specific instructional practices, including tonal and rhythmic systems, aural training strategies, kinesthetic activities, and student assessment. Data were collected using a pilot-tested researcher-designed survey developed using Qualtrics Survey Software. The survey was administered at the North Carolina High School Honors Chorus (NCHSHC) auditions. One hundred and sixty-one high school choral music educators brought students to the auditions, and all were invited to participate in the study. Of these choral music educators, a total of 127 agreed to participate yielding a response rate of 79%. Two study participants responded that they did not incorporate sight-singing instruction into their choral rehearsals. Substantial data were collected from the remaining study participants concerning their sight-singing instructional practices (n = 125). The results from the study are discussed in this chapter.

Summary and Discussion of Results

Following an exhaustive search, ten survey studies were found that had similarities to the current study (Demorest, 2004; Farenga, 2013; Floyd & Bradley, 2006; Hales, 1961; Johnson, 1987; May, 1993; Smith, 1998; Snider, 2007; von Kampen, 2003; White, 2009). All researchers who completed these studies used a survey to investigate the sight-singing instructional practices of high school choral music educators. Demorest (2004) surveyed both middle school and high school choral music educators. The studies were described in detail in Chapter II, and were used foundationally and comparatively throughout the current study.

Since not all data overlapped between studies, it was impossible to make a comprehensive comparison between each of the ten survey-studies and the current study. For example, while most researchers investigated teacher use of a tonal system, only Demorest (2004) and White (2009) surveyed choral music educators on their use of a rhythmic system. Demorest (2004) and Farenga (2013) were the only studies that investigated the use of solmization systems for minor-key sight-singing. Prior to Floyd and Bradley (2006), Johnson (1987) was the only study to investigate the use of assessment in sight-singing instruction. None of the nine studies were designed to investigate aural training strategies, and only one study (White, 2009) surveyed high school choral music educators' uses of kinesthetic activities, that is, beyond the use of solfège hand signs. In the following discussion, comparisons will be made between previous survey-designed studies and the current study. The implications for these differences and/or similarities are important to those who are concerned with the future of sight-singing instruction in the high school choral classroom.

Prevalence of Sight-Singing Instruction

The population chosen for this study were high school choral music educators who brought students to audition for the North Carolina High School Honors Chorus (NCHSHC). As a part of the audition, students were required to sight sing a short musical passage. The individual sight-singing rating accounted for 16.7% of the total audition score. Presumably, choral music educators who participated in the NCHSHC auditions possessed some level of confidence in their student's ability to sight sing, most likely due to the instruction provided the student in the chorus classroom. Therefore, it was not surprising that nearly all teachers who agreed to participate in this study (98.4%) responded that they used sight-singing instruction in rehearsals with their high school choirs. Prior research on sight-singing instructional practices

either targeted a population interested in the subject or unintentionally attracted only those choral music educators who were committed to sight-singing instruction in their rehearsals (Demorest, 2004; Farenga, 2013; Floyd & Bradley, 2006; Snider, 2007; White, 2009; von Kampen, 2003). In those studies, as in the current study, it was difficult to determine the actual percentage of total high school choral music educators who teach sight-singing to their high school students.

Participants in the current study seemed to be a homogenous group of teachers, but they varied with respect to teaching experience, choral program size, and geographic location. Experience in teaching chorus ranged from 1 to 30+ years. High school choral music educators who participated in the study had an average of 14.5 years of teaching experience with 10.7 years of teaching experiences at the high school level. The size of the choral programs of participants ranged from four students to 300 students. The average size of the choral program represented was 101 students. There are 100 counties in North Carolina. Study participants represented 43 of those counties. Not all high school chorus choral music educators in North Carolina chose to participate in the NCHSHC auditions, and consequently, were not offered the chance to participate in the survey. The variability of study sample by teaching experience, program size, and geography seemed to be an accurate representation for the population of high school choral music educators in North Carolina. Results of the study revealed that the use of sight-singing instruction in rehearsals was a prevalent and standard practice among the majority of North Carolina high school choral music educators who attended the North Carolina High School Honors Chorus auditions.

Prominent Sight-Singing Instructional Practices

Of those participants who used sight-singing instruction in their high school chorus rehearsals, 98.4% used a solmization system for tonal reading and a syllabification system for

rhythmic reading. Ninety-six percent of participants used assessments to measure student progress in sight-singing skills. Aural training strategies were an integral part of sight-singing instruction for the majority of participants (94.4%), and many participants (88.8%) used kinesthetic strategies for sight-singing instruction. Both aural training strategies and kinesthetic strategies are common instructional practices used by elementary music teachers but have not been studied in detail at the secondary level.

The majority of participants (97.5%) in the study believed that sight singing was an essential skill for all choral singers. This belief was affirmed by the number of high school choral music educators who responded that they used sight-singing instruction in rehearsals with their high school choral students (98.4%), and in the amount of rehearsal time spent on sight-singing instruction. From the results of the study, the view of the value of sight singing and the importance placed on the instruction of sight singing by high school choral music educators remained unchanged as compared to sixty years of research on the topic (Demorest, 2004; Farenga, 2013; Floyd & Bradley, 2006; Hales, 1961; Johnson, 1987; May, 1993; Myers, 2008; Nichols, 2012; Potter, 2015; Sanders, 2015; Smith, 1998; Snider, 2007; von Kampen, 2003; White, 2009).

Unlike Demorest (2004), Hales (1961) and Johnson (1987), this study did not seek to determine the difference between instruction for students in auditioned and non-auditioned choral groups. Two statements, however, provided data points to compare teacher instructional philosophy on this topic with prior studies. As Johnson found in 1987, the majority of high school choral music educators felt that sight-singing ability should be a prerequisite skill for acceptance into an auditioned ensemble. The choral music educators in the current study prepared students for those expected skills by providing sight-singing instruction to students in

all levels of ensembles. Nearly all participants in this study (96.7%) disagreed with the statement "only singers in auditioned ensembles should be taught to sight sing." This disagreement was an indication of the belief in equitable training of beginning and advanced singers, and also revealed that participants believed that all choral music students should be taught to sight sing.

Of the participants who used sight-singing instructional practices in their rehearsals, 71.5% taught pitch patterns independent of rhythm, and 98.3% taught rhythmic patterns independent of pitch. Based on participants' responses, it was evident that the practice of rhythm-only pattern drills was more common than that of pitch-only pattern drills. The disparity in the number of participants who recognized the influence of pitch on rhythm but did not recognize the interaction between the two dimensions in reverse was interesting and unexpected. Perhaps, high school choral music educators are aware of the influence of rhythm on pitch, but they don't know how to teach pitch patterns independent of rhythm.

Gordon (2012) asserted that students should audiate tonal and rhythmic patterns separately. Krumhansl (2000) argued that experience of pitch and rhythm simultaneously was confusing to students, as one construct influenced the perception and understanding of the other construct. Researchers have not discovered the exact details of how pitch and rhythm interact cognitively (Egbert, 1990; Peretz, 1993). The literature that exists on the human perception of these two dimensions of music, however, affirm the necessity of separating pitch and rhythm in sight-singing instruction—recognizing that pitch-only instruction is just as important as rhythm-only instruction. As researchers begin to clarify the cognitive interactions between pitch and rhythm, training of preservice teachers should emphasize the need for separating pitch and rhythm in sight-singing instruction, and should introduce pedagogical steps that will enable future music educators to teach the two dimensions separately to their future students.

Although participants agreed strongly that sight singing is important, there was less agreement on the need for selecting repertoire that matched the sight-singing abilities of the ensemble. While nearly half of participants either *agreed* (36.3%) or *strongly agreed* (12.9%) with the statement "repertoire should be selected to represent the sight-singing abilities of the ensemble," 21.0% *strongly disagreed* or *disagreed* with the statement and 29.8% did not align with either side of the argument. Performing repertoire that matches sight-singing ability of students provides relevance to the instruction of the skill.

For nearly 100 years, dating back to the days of the *a cappella* choir movement, high school choirs have performed music that was beyond their ability to read. Choral pieces were taught through rote, repetition, and memorization. Frequently, it appears that students graduate from choral programs with great memories of outstanding performances but no real skills to apply to future encounters with music notation. Johnson (1987) posits that students never progress beyond the basic level of sight singing because instruction primarily involves rudimentary drills with no real application to the choral music being performed. Without the careful and intentional pairing of drills and patterns with performance repertoire, sight-singing instruction is relegated to a useless exercise with no real application to written notation, and with no knowledge gained to transfer to other interactions with a musical score. Students, thus, often are not empowered to become independent musicians.

Nearly half of all choral music educators in this study believed in choosing repertoire that approximated the sight-singing ability of their choir members. Based on the results of this study, teacher-repertoire choices may have modified somewhat to provide palpable applicability of exercises and drills to sight-singing choral music intended for performance. To graduate independent sight singers, high school choral music educators must commit to choosing

literature that approximates the sight-singing ability of choir members. Instrumental educators do not choose literature for their students that they cannot read and play on their respective instruments. While there may be many reasons for this continued practice by choral music educators, perhaps the main reason why choirs continue to perform music that is beyond members' music reading level is that the teacher lacks the ability to effectively and efficiently teach students to sight sing and read music notation.

High School Choral Music Educators' Attitudes Toward Sight-Singing Instruction

The one area most common between the current study and previous surveys of high school choral music educators was the investigation of teacher attitudes toward sight-singing instruction. From the earliest study of sight-singing instructional practices of high school choral music educators (Hales, 1961), it has been evident that choral educators believe strongly in the need for and benefits of sight-singing instruction in the high school classroom. Nearly all choral music educators (98%) in Smith's (1998) study felt that sight-singing instruction was an important component of the high school choral curriculum—a finding corroborated by the current study. Some benefits of sight-singing instruction, as cited in previous studies, include creating an efficient and effective rehearsal, in which students learn new music quicker and become more confident in their skills as musicians (Smith, 1998; Snider, 2007; von Kampen, 2003). As Snider found in 2007, high school choral music educators maintain that sight-singing instruction decreases the amount of time used to teach repertoire by rote.

Participants who used sight-singing instructional practices in their rehearsals were asked to rate a series of attitudinal statements related to the perceived benefits of sight-singing instruction. Ratings were presented on a scale from *strongly disagree* to *strongly agree*. The statement "Sight-singing instruction is an important component of the high school choral

rehearsal" received the highest mean rating. The statement "Sight-singing instruction in my choral rehearsal has improved my ensemble's ability to sight sing" received the lowest mean rating. The mean ratings for all three statements of perceived benefits were greater than four on a five-point scale and the standard deviations of all statements were rather small. Based on these results, the participants believed strongly that including sight-singing instruction in high school choral rehearsals is beneficial.

All participants in the current study rated their ability to sight sing above *fair* and *poor*. Not surprisingly, the participating high school choral music educators have the training and ability to sight sing at a reasonable level of competence. Participants rated their ability to sight sing as *superior* (42.7%), *excellent* (47.6%), or *good* (9.7%). Participants' ratings of college preparation to teach sight singing did not result in a similar analysis. Over half (65.3%) of the participants rated their college preparation to teach sight singing as *poor, fair,* or *good*. This finding was also not surprising since prior studies have shown that high school choral music educators felt that their college training did not prepare them to teach sight singing to their students (Farenga, 2013; Floyd & Bradley, 2006; Smith, 1998; Kuehne, 2007; Myers, 2008; Potter, 2015).

Across reviewed studies, findings consistently supported the premise that choral music educators felt unprepared to teach sight singing. Inadequate university training was most often cited as the reason for the deficiency. In the current study, 41.9% of participants rated their college preparation to teach sight singing as *fair* or *poor*. Similarly, Smith (1998) found that 50% of choral music educators felt their university training was inadequate. Farenga (2013) found that choral music educators desired more training because ensemble participation and coursework at the college level did not prepare them to teach their students to sight sing.

Despite the lack of college training, the current study found that high school choral music educators intentionally sought ways to sharpen their skills in sight-singing instruction. The majority of participants (81.5%) reported attendance at a sight-singing workshop, presentation, or interest session within five years prior to the study. More than two decades before the current study, Smith (1998) found that 62.2% of choral music educators attended a sight-singing workshop. The choral music educators surveyed by von Kampen (2003) felt that sessions offered by the Kentucky Music Educators Association (KMEA) were helpful. Only 29.2% of von Kampen's participants, however, reported attendance at one of the KMEA sessions on sight-singing instruction. In the current study, the large number of participants who reported attendance at a professional development training for sight-singing instruction is another indication of the importance placed on the topic by the high school choral music educators participating in this study. The results of this study also indicate the dedication to improvement in an area that, traditionally, high school choral music educators have felt unprepared to teach.

Nearly all participating high school choral music educators rated their ability to teach sight singing as *superior* (15.3%), *excellent* (57.3%) or *good* (25%). Similarly, Smith (1998) found that 80% of high school choral music educators rated their ability to teach sight singing as *excellent* or *good*. Over half of participants in the current study responded with *strongly agree* (67.5%) and 30.1% responded with *agree* to the statement "Sight-singing instruction in my choral rehearsal has improved my ensembles' ability to sight sing." These ratings, as well as the ratings of the ability to teach sight singing, demonstrated the high level of confidence participants have in their ability to teach sight singing. However, it was concerning that 42.7% of participants rated their ability to sight sing as *superior,* yet only 15.3% of participants rated their ability to teach sight singing as *superior*. Farenga (2013) also found this disparity among

Arizona high school choral music educators, 25% rated their ability to sight sing as *superior* and 12% rated their ability to teach sight singing as *superior*.

Sight-Singing Instructional Time

There are numerous class scheduling models throughout North Carolina Public and Private schools. For this reason, study participants were asked to indicate the percentage of time spent on sight-singing instruction instead of the number of minutes spent on sight-singing instruction. Demorest (2004), Farenga (2013), Floyd and Bradley (2006), Snider (2007), and White (2009) also investigated the amount of rehearsal time spent on sight-singing instruction. Of these studies, Floyd and Bradley's (2006) investigation was most like the present study in that participants were asked to report the percentage of instructional time spent on sight-singing instruction. Floyd and Bradley did not report the scheduling formats available to choral music educators at the time of the study.

In the current study, participants were asked the percentage of rehearsal time spent on any activity that involved teaching students to sing music at sight, including time spent singing concert repertoire at sight and time spent sight-singing pitch or rhythmic exercises. Participants reported spending an average of 30% of instructional time on sight-singing instruction. The four scheduling models most frequently used in North Carolina high schools were: (a) 90-minute block class periods; (b) 100-minute block class periods; (c) traditional 45-minute class periods; and (d) traditional 50-minute class periods. Based on these four scheduling models, 30% of instructional time was equivalent to 13.5 to 30 minutes per rehearsal in sight-singing instruction. The most prominently used of the four scheduling models in North Carolina at the time of this study was the 90-minute block class period. Based on the results from this study, participants who taught in North Carolina's Local Education Agencies (LEA) with the 90-minute block

scheduling model spent an average of 27 minutes per class period on sight-singing instruction. The average percentage of time spent on sight-singing instruction per rehearsal in units of minutes based on the four scheduling models available in North Carolina high schools are displayed in Table 19.

Table 19. Rehearsal Time Used for Sight-Singing by Scheduling Model

Scheduling Models in North Carolina High Schools	Average Number of Minutes of Rehearsal Time Spent on Sight-Singing Instruction (30% of rehearsal time)
Block (100-minute rehearsals)	30 minutes per rehearsal
Block (90-minute rehearsals)	27 minutes per rehearsal
Traditional (50-minute rehearsals)	15 minutes per rehearsal
Traditional (45-minute rehearsals)	13.5 minutes per rehearsal

Twenty-seven minutes for sight-singing instruction is an increase in the amount of time reported in prior studies by high school choral music educators (Demorest, 2004; Farenga, 2013; Snider, 2007; White, 2009). The amount of sight-singing instructional time reported by participants in this study resulted in a 10% increase over the amount of time reported by participants in the Floyd and Bradley study (2006). Unlike Floyd and Bradley (2006) and the current study, Demorest (2004), Farenga (2013), Snider (2007), and White (2009) asked high school choral music educators to report sight-singing instructional time in minutes per class period. Snider (2007) found that choral music educators spend an average of 1 to 9 minutes of rehearsal for sight singing instruction. Demorest (2004) and Farenga (2013) found that choral

music educators spend an average of 9.5 minutes of rehearsal time teaching sight singing. White (2009) found choral music educators use 11 minutes per rehearsal for sight singing instruction.

The majority of participants (89.5%) in the current study believed that sight-singing instruction should be a part of every rehearsal—another indication of the philosophical importance placed on sight-singing instruction by participants. Despite this opinion and the obvious increase in the amount of time spent in sight-singing instruction, there was still disparity among participants concerning the amount of time available to teach students to read music. Nearly half of participants (49.2%) felt they had adequate time to teach sight-singing but 30.7% struggled with finding sufficient instructional time to devote to sight singing.

Tonal Solmization Systems

The majority of participants (87.8%) selected the moveable-*do* solmization system as the most often used system for major-key tonal singing. No participants selected "letter names" as the solmization system of choice, and very few selected "neutral syllables" (1.6%), "fixed do" (4.1%), or "scale degree numbers" (6.5%). The popularity of the moveable-*do* system in this study aligned with findings in previous surveys of choral music educators (Demorest, 2004; Farenga, 2013; Floyd & Bradley, 2006; Kuehne, 2007; May, 1993; McClung, 2001; Myers, 2008; Nichols, 2012; Potter, 2015; Smith, 1998; Snider, White, 2009). In the current study, the majority of participants (86.1%) chose moveable-*do* for minor-key tonal singing. In a comparison of those participants who used *la*-based minor (65.0%) to those who used *do*-based minor (21.1%), notably more participants used moveable-*do* solfege with *la* as tonic when teaching minor-key tonal singing. The results from this study indicated a continued preference for the movable-*do* solmization system and an increased preference for the *la*-minor solmization system since Demorest's study in 2004. A comparison of the solmization systems used by the

participants in the current study with those in other surveys of high school choral music educators is displayed in Table 20 for major-key tonal sight singing and in Table 21 for minor-key tonal sight singing.

Table 20: Comparison of Findings for Major-key Tonal Solmization

Survey Studies	Major Tonality					
	Moveable-*do*	**Fixed-*do***	**Scale Degree Numbers**	**Neutral Syllables**	**Letter Names**	**Other**
Demorest (2004)	64.0%	4.0%	21.0%	8.0%	---	3.0%
Floyd and Bradley (2006)	75.0%	---	8.3%	---	16.7% [a]	---
Snider (2007)	50.0%	6.0%	38.0%	---	6.0%	---
White (2009) [b]	66.8%	7.3%	7.1%	2.4%	9.3%	7.1%
Farenga (2013)	82.0%	11.0%	7.6%	---	---	2.3%
Earnhardt (2021)	87.8%	4.1%	6.5%	1.6%	0.0%	---

Note. (---) = No data collected by researcher for this category.
[a] Study Participants used a combination of movable-*do*, numbers, and/or letters.
[b] Only frequency ratings of "always" are reported in this table.

Table 21: Comparison of Findings for Minor-key Tonal Solmization

Survey Studies	Minor Tonality			
	Moveable-*do*		**Scale Degree Numbers**	
	***La*-based**	***Do*-based**	***6* as tonic**	***1* as tonic**
Demorest (2004)	47.0%	17.0%	10.0%	11.0%
Farenga (2013)	66.0%	34.0%	---	---
Earnhardt (2021)	65.0%	21.1%	3.3%	1.6%

Note. (---) = No data collected by researcher for this category.

Existing literature did not indicate the superiority of one tonal solmization system as compared to other tonal solmization systems. Gordon and other pedagogues who supported the

sound-before-sight approach, however, argued for a function-based system where tonality is stressed to maximize audiation (Gordon, 2012). Gordon considered the moveable-*do* solmization with *la*-based minor a function-based system because as the tonic and other solfège syllables shift with a change in tonality, the relationship between the syllables in the system remain the same. Using Gordon's definition, most of the participants in the current study prefer a function-based system for tonal sight-singing.

Rhythmic Syllabification Systems

Nearly all participants in this study (94.3%) use Takadimi (66.7%) or counting (27.6%) for teaching students to sight-sing rhythmic patterns. An analysis of participants' ratings of these two systems revealed a stronger preference for Takadimi than for all other rhythmic syllabification systems. Of the survey studies selected for comparison to the current study, only Demorest (2004) and White (2009) investigated choral music educators' choices of a system to teach rhythm. This lack of research of rhythmic systems is unfortunate as several studies found rhythmic reading ability to be a strong predictor of music reading ability (Henry, 2011; Stegall, 1992).

Both Demorest (2004) and White (2009) found the counting system to be the most popular among choral music educators. Kodály, Dalcroze, Orff, and Gordon emphasized the "sound before sight" approach and, therefore, would have argued against the use of counting for teaching rhythms. Counting beats requires students to possess a theoretical knowledge of meter, beat placement, and note duration. At the time of this study, the Takadimi system was a fairly new system for reading rhythms designed by Hoffman, Pelto, and White (1996) in response to declining rhythmic skills in college-level instrumentalists. According to Potter (2015), Takadimi satisfies the premise of sound-before-sight instruction by the ease at which the system could be

used at the aural stage of learning and the effortless adaption of the system to all meters, rhythms, and types of music. Takadimi is a function-based system because rhythms are assigned a unique syllable based on their function within the macrobeat. The overwhelming popularity of the Takadimi system by participants in this study may represent a shift in the philosophical views of high school choral music educators as related to aural skills training at the high school level, and as related to the use of a function-based system over a theory-based system for teaching rhythms.

Aural Training Strategies in Sight-Singing Instruction

A unique aspect of this study as compared to prior survey research was the inquiry into choral music educators' uses of aural training strategies to teach sight singing to their students. Nearly all participants (94.4%) used aural training strategies to accomplish sight-singing instructional goals. Participants rated their use of aural training strategies for sight-singing development on a scale from *never* to *very frequently*. The largest percentage of participants (41.8%) reported a *frequent* use of aural training strategies. An exhaustive search produced no studies for which to compare the current results on the prevalence of the use of aural training strategies by high school choral music educators. Based on this study, however, choral music educators use of aural training strategies in sight-singing instruction at the high school level was a fairly common practice.

Two statements were designed to measure participants' beliefs concerning aural skills as related to sight-singing. Participants rated their agreement with each statement from *strongly disagree* to *strongly agree*. Nearly half of the participants in this study (44.1%) chose *neutral* for the first statement "Students should exhibit mastery in aural skills before reading printed notation." There was a markedly strong preference for *neutral* over all other rating choices. The

majority of participants (46.6%) selected *disagree* for the second statement "The principle of 'sound before sight' applies more to elementary-aged music students than to high-school aged music students." With all other ratings removed from the analysis but the most selected ratings of *disagree* and *strongly disagree* for the second statement, there remained a notable disagreement with the second aural skills statement as related to sight singing.

At first glance, participants' ratings of the two aural skills statements seemed to be a contradiction to their opinions about the importance of aural training. Apparently, choral music educators who use aural strategies to teach students to sight sing believe that sound should be taught before reading notation—an assumption corroborated by this study. Participant neutrality of agreement with the first statement, concerning mastery of aural skills before the introduction of notation, was surprising considering the ratings of the second statement, concerning the application of the principle of 'sound before sight' at the secondary level. Perhaps, the use of the word "mastery" in the first statement influenced participants' ratings. Mastery of aural skills requires additional instruction and time, thereby, delaying the introduction of notation and the learning of repertoire for pending performances.

Participants were presented a list of aural training strategies commonly used in music classrooms and were asked to indicate the frequency for which they used each one in sight-singing instruction. Ratings ranged from *never* to *very frequently*. An analysis of participants' choices revealed that "imitation of a vocal demonstration" was used more frequently than all other strategies. The least frequently used of all aural training strategies was "improvisation." "Imitation of an instrumental demonstration" was used slightly more than "improvisation." The large variance of responses for "imitation of an instrumental demonstration" possibly occurred due to the lack of specificity of the instrument that served as the foundation of the survey for the

current study. Perhaps, if the phrase "imitation of a piano demonstration" had been used instead of the phrase "imitation of an instrumental demonstration," there would have been increased agreement between participants and possibly an increased mean frequency rating of the aural training strategy "imitation of an instrumental demonstration."

Ninety-three percent of participants reported that they *frequently* or very *frequently* used "imitation of a vocal demonstration" as an aural training strategy, but only 47.5% assigned the same frequency rating to "rote singing." Arguably, "rote singing" and "imitation of a vocal demonstration" are very similar aural training strategies. Armstrong (2001) recounted the view that rote singing was blamed for the demise of sight-singing instruction in the 1920s. Several authors reported that teaching by rote was the least effective and most inefficient way of teaching sight-singing (Colwell, 1963; Dwiggins, 1984; Hales, 1961). Perhaps, participants rated "rote singing" lower than "imitation of a vocal demonstration" to detach their instructional practices from an aural training strategy with a historically negative association. Kodály, Dalcroze, Orff, and Gordon considered rote singing to be a necessary step in developing aural skills and music-reading skills—an affirmation for the use of rote singing to build sight-singing ability. The methods and approaches of these pedagogues, however, are associated with elementary music education, and therefore, not typically practiced by high school choral music educators.

Rote singing has been practiced for ages in many cultures. Lind and McKoy (2016) explained that focus on ensemble performance by high school music educators created a reliance on notation. High school choral music educators who focus solely on notation are effectively ignoring the learning mode of students who have learned music in an aural tradition. While teaching songs by rote should not be the only vehicle by which students learn to perform music, rote singing can be helpful in building the aural skills needed to prepare students to sight-sing.

And, perhaps more importantly, teaching music by rote can be a way to honor the musical traditions of many students.

A review of research literature revealed minimal, if any, previous research that investigated choral music educators use of aural training strategies during sight-singing instruction. For that reason, an additional analysis was conducted to compare the frequency ratings of aural strategies by those who *sometimes, frequently*, or *very frequently* used these strategies for sight-singing instruction. There was a notable difference between participants for four aural training strategies: "rote singing", "dictation", "interval training", and "improvisation." Those who *very frequently* used aural training strategies for sight-singing instruction used "rote singing" more than those who *frequently* used aural training strategies. Also, those who *very frequently* used aural training strategies for sight-singing instruction used two aural strategies more than those who *sometimes* used aural training strategies for sight-singing instruction: "improvisation" and "interval training." Finally, those who *very frequently* used aural training strategies for sight-singing instruction used "dictation" notably more often than those participants who *sometimes* or *frequently* used aural training strategies for sight-singing instruction.

Improvisation was the least used of all aural training strategies in this study. Even for the participants in the *frequently* group, who used the strategy significantly more than those participants in the *sometimes* group, improvisation was used less often than five of the seven aural training strategies on the list. Improvisation develops and refines student aural skills. To improvise, students must rely on cognitive processes to create new and meaningful musical ideas mentally then vocally. Gordon (2012) maintained that music reading ability is developed in the same way as language reading ability. Children begin in the "babble" stage where sounds are

imitated through vocalizations. As children grow, they are exposed to the tonal language of their culture and begin to recognize musical patterns that are familiar. In the partial synthesis stage of learning, students begin to make inferences and predictions concerning patterns in music. It is through vocal improvisations of tonal and rhythmic patterns, vocabularies developed through the verbal association stage of learning, that students demonstrate a deep meaning of musical structure and are ready to read notation (Gordon, 2012). In this way, sight-singing instruction functions as emergent literacy—providing students with the skills necessary to bring meaning and context to notation when it is introduced.

A unique aspect of this study as compared to all other investigations of the sight-singing instructional practices of high school choral music educators was the examination of the uses of aural training strategies to teach sight singing. For this reason, participants were asked to provide aural training strategies that were not on the list in the survey. Common practices listed were error detection exercises, the use of audiation, the drill of common pitch and rhythmic patterns, dictation of pitch and rhythmic patterns from neutral to syllable, and the rehearsal of chords, arpeggios, and scales.

Kinesthetic Strategies in Sight-Singing Instruction

At the heart of the Dalcroze method of instruction is the intimate relationship between music and movement. This relationship also is supported by Gordon, Kodály, and Orff and by many other authors (Anderson, 2012; Apfelstadt, 1985; Chagnon, 2001; Galvao & Kemp, 1999; Hodges, 2000; Reifinger, 2013; Wis, 1993). Despite O'Conner's (1987) proposal that choral music educators tend to emphasize visualization over the other learning modalities, it is apparent from the results of the current study that high school choral music educators use kinesthetic activities often in sight-singing instruction.

Most participants (88.8%) reported the use of kinesthetic strategies for sight-singing instruction. Participants rated their use of kinesthetic strategies for sight-singing instruction on a scale from *never* to *very frequently*. Over half of participants (52.5%) reported a very frequent use of kinesthetic strategies. There have been many studies that investigated the use of movement in high school choral classrooms to improve vocal production and to increase musical expression, but very little to investigate the use of movement for sight-singing instruction. In the current study, high school choral music educators seemed to take advantage of the relationship between movement and music perception—incorporating kinesthetic strategies designed to help students learn to sight sing.

Participants were presented with a list of kinesthetic strategies and were asked to indicate the frequency for which each strategy was used in their rehearsals. Ratings ranged from *never* to *very frequently*. The list of kinesthetic activities used for the study survey was generated from an open-ended item in White's (2009) survey of high school choral music educators. Unlike the current study, White (2009) did not ask participants to rate the frequency for which they used each movement activity. In the current study, an analysis of participants' ratings of kinesthetic activities revealed that "solfège (Curwen) hand signs" were used more frequently than all other kinesthetic activities in the list. The least frequently used of all kinesthetic activities in the list was "clapping."

With exception to White (2009), there have been very few studies of the use of kinesthetic activities to facilitate sight-singing instruction for high school choral students. The lack of research on kinesthetic activities in the sight-singing instruction of high school students constituted an additional analysis on the data collected for the current study. The analysis was used to clarify the kinesthetic activities most often used by high school choral music educators to

teach sight singing. The goal of the analysis was to determine if there were differences between participants who *sometimes*, *frequently*, or *very frequently* used kinesthetic strategies for sight-singing instruction.

There was a significant difference between participants' ratings of four kinesthetic strategies, including "Solfège (Curwen) hand signs," "tracing the contour of the tonal line," "patsching," and "clapping." Those who *very frequently* used kinesthetic strategies for sight-singing instruction used "solfège (Curwen) hand signs" and "patsching" notably more than those who *sometimes* and *frequently* used kinesthetic strategies for sight-singing instruction. Also, those participants who *very frequently* used kinesthetic strategies for sight-singing instruction used "tracing the contour of the tonal line" more than those participants who *sometimes* used aural training strategies for sight-singing instruction. Those who *frequently* used kinesthetic activities for sight-singing instruction used "clapping" more often than those participants who *very frequently* used kinesthetic activity to teach sight-singing, and used "tracing the contour of the tonal line" more than the participants who *sometimes* used kinesthetic strategies to teach students to sight sing.

The finding that solfège hand signs were selected as the most frequently used kinesthetic activity by participants in this study contradicted Giles (1991) view that very few high school choral music educators used hand signs for instruction. Solfège hand signs are the most studied of all other movement activities for sight-singing instruction. Hand signs, when used with solfège syllables, provide an experience in all three learning modalities: (a) kinesthetic—students perform each hand sign while singing or listening; (b) aural—students sing or listen to others sing while signing; and (c) visual—students read notation while signing or watch others in the class perform hand signs. While some see hand signs as an activity that adds complexity to the

already complicated act of sight-singing, research has not demonstrated the kinesthetic activity as a deterrent or a benefit to learning. The uncertainty of these reports did not seem to discourage the participants in this study from using hand signs in sight-singing instruction. Perhaps there are benefits of this multimodal activity that research has yet to recognize but that high school choral music educators witness each day in the classroom.

Only two of the seven strategies listed in the survey were used as a physical indication of pitch: "Solfège (Curwen) hand signs" and "tracing the contour of the tonal line." The other five strategies were used as a physical demonstration of the steady beat (or divisions of the beat), the meter of a piece of music, or the rhythm of the lyrics of a song: "patsching," "conducting," "tapping," "walking," and "clapping." Placed into two groups, "tonal"—those strategies used to teach students to read pitch—and "rhythm"—those strategies used to teach students to read rhythm, "solfège (Curwen) hand signs" was the most frequently used kinesthetic strategy in the "tonal" group and "patsching" was the most frequently used kinesthetic strategy in the "rhythm" group. In addition to providing a frequency rating for the seven activities listed in the survey, participants were asked to submit additional kinesthetic strategies they used to help teach sight singing. While most participants provided an activity typically used for indicating rhythm, a few offered activities that could be used for indicating pitch. These included "body solfège" and "stairs [as a] metaphor for scale degrees."

Participants selected patsching as the second most frequently used kinesthetic activity, and the most frequently used of all kinesthetic activities typically used for rhythm. The largest standard deviation in the group of strategies, however, was for "patsching." The variance in responses could be explained by the unfamiliarity with the word among high school choral music educators. Patsching is most associated with the approaches of Orff and Kodály. While

patsching, students feel the main beat on their thighs—usually with both hands—and alternate with another activity (clapping, snapping, or touching another body part) to demonstrate the subdivision of the beat. McCoy (1986) suggested that using a movement to mark the pulse and subdivisions improved student understanding of beat duration. One of the strategies observed by Henry (2008) and Killian and Henry (2005) associated with success in sight singing was an outward indication of the beat using the body. An exhaustive search produced no evidence in the effectiveness of patsching for rhythmic instruction in the high school choral classroom. In this study, however, the participants who most often used kinesthetic activity for sight-singing instruction used patsching notably more than all other participants in the study. While the popularity of an activity does not predict the effectiveness of the activity, perhaps those choral music educators who are most inclined to use kinesthetic activity in sight-singing instruction realize a strength of patsching that needs to be investigated.

Assessment of Sight Singing

Of the participants who used sight-singing instruction in rehearsals, 96% individually assessed students' sight -singing skills or abilities. The frequency for which participants administered assessments varied from *infrequently* (16.4%) to *very frequently* (10.7%). Seventy-two participants provided the specific number of times students were assessed—both formally and informally. Although enumerated data collected revealed an assessment frequency of 35.3 times per year, the high standard deviation, kurtosis, skewness, and range of responses brought into question the validity of the data and results. The words "formal" and "informal" were used as a prequalification of the estimate of student assessments. The inclusion of these qualifiers may have resulted in inflated responses from participants.

The implementation of the National Standards for Music in 1994 called for music educators to consider and evaluate the individual growth of each student. Since that time, several survey studies found increased implementation of sight-singing assessment by high school choral music educators (Demorest, 2004; Floyd and Bradley, 2006, White, 2009). The frequency for which these assessments were given were unclear, except for participants surveyed by Floyd and Bradley (2007). These researchers reported that 26% of high school choral music educators gave sight-singing assessments once a year or once a semester.

Participants were asked to rate the use of prescribed settings for which they assessed their students' sight-singing ability from *never* to *very frequently.* Six settings were described in a list of choices. Three of the settings began with the word "alone"—an indication that students performed the evaluation alone. The other three settings began with the phrase "in small groups"—an indication that students performed as a group but each student would be individually evaluated from the performance. In each group of settings, "alone" and "in small groups", two settings choices involved student performances that were recorded—an evaluation listened to and graded by the teacher at a time after the performance. The third choice in each group involved a live performance—an evaluation that would be graded as the performance happened.

Participants reported the highest rated assessment setting as "in small groups – performed live for the teacher." Although the frequency for the setting "alone – recorded in isolation" was rated slightly lower than "in small groups – performed live for the teacher," it was the highest rated setting of the "alone" group and the only choice in the three highest rated settings that required recorded student performances. The other settings requiring recorded performances were rated as the least frequently used testing formats.

In Demorest's (1998) study, students recorded sight-singing evaluations in isolation. From an analysis of pre- and posttest scores, Demorest proposed that individual testing helped to improve the sight-singing ability of the student—perhaps by motivating them to practice more on their own. Nolker (2001) argued that to obtain accurate measurements of student sight-singing ability, the assessment setting and the instructional setting should remain consistent. In Nolker's study, individual singers recorded themselves sight-singing in a group setting. Nolker found that the evaluations were as reliable as recordings in isolation.

In the current study, data revealed that high school choral music educators assess students in a variety of settings, including the evaluation of students both in isolation and in a group setting. Perhaps this variety of testing settings provide a more precise measure of student learning of sight singing than conducting assessments consistently in one setting. While Demorest (2004) asserts that recorded assessments are the most time efficient method of evaluating students, recorded assessments require a large amount of grading time outside of rehearsal. It was not surprising that participants rated "in small groups - performed live for the teacher" and "alone – performed live for the teacher" higher than all but one of the settings requiring recordings.

In addition to regular assessments of sight-singing, the participants in this study considered the skill important enough to include grades from these assessments on a student's school record. Eighty-five percent of participants responded that they *sometimes*, *frequently* or *very frequently* include sight-singing assessments in a student's final grade. Snider (2007) found that 69% of choral music educators included sight-singing assessment in a student's final grade, a smaller percentage than found in this study. As in the current study, Demorest (2004) found that a large percentage of choral music educators (86%) included sight-singing assessments on

the student's final grade for chorus, but only 43% of teachers counted the grade as more than 10% of a student's total evaluation.

In all areas of education, students are frequently assessed on curricular goals. In the high school chorus classroom, however, McCoy (1991) pointed out that the standard practice has been to grade students on non-achievement processes such as attendance, attitude, effort, and participation. The increase in the number of high school choral music educators who counted the results of sight-singing assessments in the final grade of students may indicate a commitment to individual achievement of curricular goals rather than a subjective evaluation of student non-academic behaviors.

Researchers have found that choral music educators whose choirs participate in sight-singing adjudication at choral festivals spend more time on the practice of sight singing in the classroom and are more likely to count sight-singing assessment as a part of a student's chorus grade (Brendell, 1996; Demorest, 2001; Norris, 2004; Snider, 2007). Each year, the high school choral section of the North Carolina Music Educators Association (NCMEA) sponsors music performance adjudications. At this event, high school choral music educators voluntarily bring their choirs to receive ratings and comments from three judges on the performance of two prepared pieces of repertoire. Ensemble sight-singing adjudication is performed in a separate room. Participation in sight-singing adjudication is not mandatory and the score received by the judge in the sight-singing room is not included in the overall rating of the choir. Ninety-four percent of participants in the current study report that their choirs participated in the NCMEA Music Performance Adjudications during the three years prior to this study. Of those whose choirs participated in the music performance adjudications, 75% participated in group sight-singing adjudication. Perhaps, this finding could explain other findings in the study, such as: (a)

the substantial amount of time used by participants for sight-singing instruction, and (b) the large number of participants who include sight-singing assessments in the final grade of students.

Farenga (2013) found only 17.4% of Arizona high school choral music educators participated in festivals that included voluntary sight-singing adjudication. The number of participants in the current study whose choirs participate in sight-singing adjudication in North Carolina could be another indication of the confidence high school choral music educators have in their ability to teach sight singing. Alternately, voluntary participation in sight-singing adjudication of the event could be an expected tradition since the scoring of ensemble sight singing has been a part of NCMEA sponsored choral festivals since the mid-1990s. It may be time for the high school choral section of NCMEA to consider the requirement of sight-singing adjudication at their MPA events. Interestingly, the high school band section of NCMEA already has a requirement of sight reading by all instrumental ensembles at their music performance adjudications.

Implications for Future Research

The participants in this study were North Carolina high school choral music educators who brought their students to audition for the North Carolina High School Honors Chorus (NCHSHC). Students auditioning for the choir were required to sight sing a melodic passage. The score for sight singing the melodic passage counted as 16.7% of the total score awarded for the audition. Presumedly, the participants prepared their students for the sight-singing portion of the audition, and therefore, possessed some understanding and appreciation for sight-singing instruction. There were many other high school choral music educators in North Carolina who did not bring students to audition for the NCHSHC. Future studies should be designed to investigate the sight-singing instructional practices of the entire population of high school choral

music educators in North Carolina Public and Private Schools. Such an investigation may provide the most accurate estimate of the prevalence of sight-singing instruction in North Carolina public and private high school chorus classrooms.

A potentially fascinating and worthwhile study also would be to investigate the association between students' NCHSHC sight-singing scores and the sight-singing instructional practices of their teachers. The NCHSHC auditions occur every school year and scores are saved by the NCHSHC coordinator. Scores from multiple years could be used in the association to classroom instruction of students from one school. Many high school choral educators (75%) who participated in this study also participated in sight-singing adjudication at the state choral festival. An interesting study also would be to explore the effects of teacher-reported sight-singing instructional practices in the classroom on the sight-singing scores of choral ensembles at state choral festivals. Both studies may help identify the most effective pedagogical methods to use with high school chorus students.

In the current study, over 80% of participants attended workshops to sharpen their sight-singing instructional skills. Additionally, the high school choral music educators in this study expressed confidence in their abilities to teach sight-singing to their students. Additional research should be conducted to determine the commonality between workshop attendance, the material presented at the workshops, and the effectiveness of the instructional tools taught during these events.

The results of this study showed that participants spend an average of 30% of instructional time in sight-singing instruction Participants in this study were asked to report the rehearsal time spent singing concert repertoire at sight as well as sight-singing drills. Perhaps the request to include all facets of sight-singing instruction inflated the estimate of sight-singing

instructional time use reported by participants. The inquiry of sight-singing instructional time in previous studies did not include such a qualification. Nearly half of the participants in this study selected music according to the sight-singing ability of their choir members. Perhaps, high school choral music educators are beginning to recognize the importance of applying knowledge gained through pattern and drill instruction to sight-singing repertoire for performance. For those who continue the practice of selecting repertoire well beyond the reading level of the choir members, it may be time to reflect upon the purpose of choral music education. Future research investigating the length of time choral music educators use for sight-singing instruction should consider all facets of such instruction, and not just time spent in sight-singing drills. Researchers also should investigate the effect of repertoire choice on the outcomes of sight-singing instruction.

A unique characteristic of this study as compared to previous surveys of high school choral music educators was the researchers' focus on aural training strategies and kinesthetic activities used in sight-singing instruction. These areas warrant additional attention by choral music education researchers to answer the following unanswered questions. Is the use of aural and kinesthetic activities prevalent in high school programs across the country? Which aural and kinesthetic strategies are most effective in teaching high school students to sight sing? If aural training and kinesthetic activities are effective at the high school level, perhaps supportive instruction may be implemented by elementary and middle school music educators to prepare students for the high school choral experience.

Fewer participants in this study incorporated kinesthetic strategies (88.8%) than aural training strategies (94.4%) for sight-singing instruction. However, the frequency for which participants used kinesthetic strategies for sight-singing instruction was greater than the

frequency for which participants used aural training—85.5% of participants *frequently* or *very frequently* incorporated kinesthetic strategies while only 65.6% incorporated aural training strategies at the same frequency levels. The reasons for this disparity were unclear and future investigations of this disparity would be worthwhile.

Improvisation was the lowest rated of seven aural training strategies listed in the survey. The reason why improvisation was the least used of all aural training strategies in this study was unclear. Whitman (2001) listed several reasons music educators often cited for the lack of improvisation instruction. These reasons included: (a) little training on the use of improvisation in the ensemble setting; and (b) the teacher's lack of skill to improvise. As asserted by many authors and pedagogues, improvisation develops and refines student aural skills and enables a deeper understanding of music structure (Azzara, 1999; Chandler, 2018; Gordon, 2012; Hickey, 1997; Scott, 2007). If this is true, improvisation may be the key to connecting student musical experiences with an understanding of musical notation and a greater ability to sing music at sight. Future research should investigate the use of improvisation to teach sight-singing skills to high school choral singers.

Future surveys of high school choral music educators on sight-singing instructional methods should include an inquiry of kinesthetic activity implemented to teach students to read rhythms at sight. In the survey for this study, four of the six kinesthetic activities listed for participants to rate for frequency of use were strategies to show the beat in the body, including patsching, tapping, walking, and clapping. When prompted to list other kinesthetic activities used to teach students to sight sing, ten of the twenty-five participants who responded listed a way for students to physically demonstrate the beat using their body. Although there are several ways for

students to move to rhythm, there was little research on the most effective muscular movements for students to acquire an understanding of the musical construct.

The results of this study showed Takadimi to be the most frequently used rhythmic syllabification system and moveable-*do* with *la*-based minor to be the most frequently used tonal system. For many years, moveable-*do* with *la*-based minor solmization has been the most popular system used by high school choral music educators. Like moveable-*do* with *la*-based minor solmization, Takadimi satisfies the requirements of a function-based system. Therefore, both the rhythmic syllabification and tonal solmization systems used most often by high school choral music educators in this study were function-based systems. The current study was not designed to investigate how these systems are being used to teach sight-singing. Are the systems used to sharpen the aural skills of the high school singer, or are they simply used as a tool to read tonal and rhythmic patterns? An investigation designed to determine the specific uses of these systems in the high school chorus classroom would be beneficial. If these systems are used for aural training in preparation for the reading of notation, what are the outcomes of such instructional practices?

The results of this study concerning the use of function-based systems by high school choral music educators should inform the instructional practices of university faculty. One would believe that music students, who learn to sight sing with a function-based system, develop some knowledge of music theory by the time they reach the collegiate level. If not, aural skills professors should be prepared to help students make connections between the function-based systems learned at the high school level and the theoretical material expected by the music education curriculum. Should students at the college level read using theory-based systems (counting, *do*-based minor, etc.) or should students at the college level continue to read using the

function-based systems learned at the high school level? More research is needed on the effectiveness of function-based vs. theory-based systems on the sight-singing ability of choral singers. If function-based systems are found to be effective, perhaps, there should be some consideration that continued use of a function-based system throughout college-level aural training could prepare future music educators to teach their students to become successful sight singers.

Conclusions

Results of this study support the premise that the selected sample of high school choral music educators of North Carolina believe that sight-singing instruction is an important part of their curriculum. In addition to agreeing on the importance of sight-singing instruction, the high school choral music educators in this study also agree on the systems used to teach tonal and rhythmic reading. These choral music educators have found multiple strategies to teach the skill of sight singing to their students. These strategies include kinesthetic activities, aural training strategies, and assessment. These important domains of sight-singing instruction have not been thoroughly investigated in prior surveys of high school choral music educators.

The popularity of an instructional practice does not predict the effectiveness of that practice in fulfilling instructional goals. There is merit, however, in considering and investigating the most used instructional methods by high school choral music educators, especially those who bring students to events where individual sight singing is required and is evaluated. The results of this study should be carefully considered by all who are interested in the sight-singing ability of the choral singer. Beyond informing stakeholders of the most prevalent sight-singing instructional practices, the results of the study may also demonstrate some key philosophical

shifts of the high school choral teacher that may have a ripple effect among other levels of music education.

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APPENDIX A: IRB APPROVAL

Spartan [redacted]

IRB Notice - 20-0084

1 message

[redacted] uncg.edu [redacted]

To: Carol Earnhardt
School of Music
[redacted]

From: UNCG IRB

[redacted]

RE: Notice of IRB Exemption
Exemption Category: 2.Survey, interview, public observation
Study #: 20-0084
Study Title: Descriptive Analysis of a Survey of Sight-Singing Teaching Methods and Approaches by North Carolina Choral Music Educators

This submission has been reviewed by the IRB and was determined to be exempt from further review according to the regulatory category cited above under 45 CFR 46.101(b).

Study Description:

The purpose of this study is to describe current sight-singing instructional practices in high school choral rehearsals in the state of North Carolina. Data collected from a survey of high school choral educators will measure their uses of recommended sight-singing methods and approaches in choral music classroom. Date collected also will be analyzed to determine choral music educators attitudes toward sight-singing instruction.

Investigator's Responsibilities

Please be aware that any changes to your protocol must be reviewed by the IRB prior to being implemented. **Please utilize the the consent form/information sheet with the most recent version date when enrolling participants**. The IRB will maintain records for this study for three years from the date of the original determination of exempt status.

Please be aware that valid human subjects training and signed statements of confidentiality for all members of research team need to be kept on file with the lead investigator. Please note that you will also need to remain in compliance with the university "Access To and Retention of Research Data" Policy which can be found at http://policy.uncg.edu/university-policies/research_data/.

APPENDIX B: NCMEA HIGH SCHOOL HONORS CHORUS BOARD APPROVAL

NORTH CAROLINA MUSIC EDUCATORS ASSOCIATION

High School Honors Chorus – [redacted]

September 3, 2019

Dear Carol Earnhardt,

As you know, the NCMEA High School Choral Board voted in November 2018 in unanimous approval for you to conduct your survey study, "descriptive analysis of a survey of sight-singing teaching methods and approaches by North Carolina choral music educators" of the high school teachers of NC and to share with you any information you may need to fulfill this study.

As the coordinator of the honors chorus I would like to invite you to come to come to our audition events and speak to teachers during the audition process so they will be able to take your survey. Our auditions will begin in the East this year. Please see our dates below.

Meredith College – Raleigh, NC
UNC Greensboro – Greensboro, NC
St. Luke's UMC – Hickory, NC [redacted]

I will enclose a more exact itinerary to give you addresses and times. I will need to update the exact times closer to auditions due to scheduling. If you have any questions about the event, please call me at ([redacted] 3[redacted]r email me a[redacted]look forward to seeing you and eventually seeing the results of your study.

Sincerely,

[redacted]
NC HS Honors Chorus Coordinator

APPENDIX C: SURVEY INSTRUMENT

North Carolina High School Chorus Teacher Sight-Singing Instructional Practices

Survey Flow

Start of Block 1: Consent

Q1.1 Survey of Sight-Singing Teaching Methods and Approaches by North Carolina Choral Music Educators

This study is being conducted by *Carol Earnhardt*, a Ph.D. candidate in Music Education at the University of North Carolina at Greensboro. You are being asked to take part in a research study. Your participation in the study is *voluntary*. You may choose not to join, or you may withdraw your consent to be in the study, for any reason, without penalty.

Research studies are designed to obtain new knowledge that may help people in the future. There may not be any direct benefit to you for being in the research study. If you choose not to be in the study or to leave the study before it is done, it will not affect your relationship with the researcher or with the University of North Carolina at Greensboro. Details about this study are discussed in this consent form so that you can make an informed choice about being in this research study. If you have any questions about this study at any time, you should ask the researcher whose contact information is listed below.

This is a research project. Your participation is voluntary. The purpose of this study is to examine the methods and approaches used to teach sight singing to high school choral students. You were selected for participation in this study because you are a high school choral teacher in North Carolina. Your responses are important to understanding the sight-singing instructional practices used in North Carolina high school choral classrooms.

If you agree to participate in this study, you will be asked a series of questions regarding the sight-singing instructional practices you use in your classroom. The entire survey will take approximately 10 *minutes to complete*.

All information obtained in this study is strictly confidential unless disclosure is required by law. In any sort of report published from survey results, we will not include any information that will make it possible to identify a subject. Research records will be password protected and only researchers will have access to information collected from survey responses. Absolute confidentiality of data provided through the Internet cannot be guaranteed due to the limited protections of Internet access. Please be sure to close your browser when finished so no one will be able to see what you have been doing. Your de-identified data will be kept indefinitely and may be used for future research without your additional consent.

By selecting “yes, I consent to participate in this survey” and by completing this survey, you are agreeing that you read, or it has been read to you, and you fully understand the contents of this document and are openly willing consent to take part in this study. All of your questions concerning this study have been answered. By signing this form, you are agreeing that you are 18 years of age or older and are agreeing to participate in this study described to you by Carol Earnhardt.

Carol Earnhardt
[redacted]
[redacted]
Dr. Patricia Sink, Faculty Advisor
[redacted]

Q1.2 By consenting to this study, you are indicating your agreement to the following statement: *"I have read the information about the study. I have asked and have received answers to any questions I have about this information."*

- ○ Yes, I consent to participate in this survey. (1)
- ○ No, I do not consent to participate in this survey. (2)

Skip To: End of Survey If NO, I do not consent to participate in this survey. (2)

End of Block 1: Consent

Start of Block 2: Demographics

Q2.1 Please type the name of the high school at which you currently teach._____

Q2.2 In what county do you currently teach?_____

Q2.3 How many years, including this year, have you taught at this school?_____

Q2.4 How many years, including this year, have you taught chorus at the high school level?_____

Q2.5 How many years, including this year, have you taught chorus at any grade level?_____

Q2.6 This year, approximately how many students are in your choral program?_____

Q2.7 Do you incorporate sight-singing instruction into rehearsals with your high school choir(s)?

- Yes
- No

Skip To: End of Survey If No

End of Block 2: Demographics

Start of Block 3: Attitude

Q3.1 Rate your ability to sight sing.

- Superior
- Excellent
- Good
- Fair
- Poor

Q3.2 Rate your ability to teach sight singing.

- Superior
- Excellent
- Good
- Fair
- Poor

Q3.3 Rate your college preparation for teaching sight singing.

- ○ Superior
- ○ Excellent
- ○ Good
- ○ Fair
- ○ Poor

Q3.4 Indicate the degree to which you agree or disagree with each of the following statements.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Sight-singing instruction is an important component of the high school choral rehearsal. (1)	○	○	○	○	○
Sight-singing instruction should be a part of every rehearsal. (2)	○	○	○	○	○
Only singers in auditioned ensembles should be taught to sight sing. (3)	○	○	○	○	○
Choirs who sight sing regularly learn music faster than choirs who do not. (4)	○	○	○	○	○
I have difficulty finding enough time to teach sight singing. (5)	○	○	○	○	○
Sight singing is an essential skill for all choral singers. (6)	○	○	○	○	○
Repertoire should be selected to reflect the sight-singing abilities of the ensemble. (7)	○	○	○	○	○

Sight-singing instruction in my choral rehearsal has improved my ensemble's ability to sight sing. (8)	○	○	○	○	○
The ability to sight sing should be a prerequisite for singers to join an auditioned choir. (9)	○	○	○	○	○

Q3.5 In the past 3 years, have any of your choirs participated in sight-singing adjudication at the North Carolina Music Educators Association Music Performance Adjudication (NCMEA MPA)?

- ○ Yes
- ○ No
- ○ My choirs do not participate in NCMEA MPA (performance or sight singing)

Q3.6 Estimate the ***average percentage*** of rehearsal time you spend on sight-singing instruction throughout the year (include time spent singing concert repertoire at sight, singing pitch or rhythm exercises, etc..).

	0 10 20 30 40 50 60 70 80 90 100
Average percentage of rehearsal time spent on sight-singing instruction ()	

Q3.7 In the last five years, have you attended at least one workshop, presentation, or interest session on the topic of sight singing in the choral rehearsal?

- ○ Yes
- ○ No

End of Block 3: Attitude

Start of Block 4: Tonal and rhythmic

Q4.1 **In this section, you will respond to questions concerning the instructional practices you use with your high school choirs to teach sight singing. Your answers should reflect your best practices with all of your choirs, including beginning, intermediate, proficient, and advanced.**

Q4.2 What solmization system do you use *most often* for major-key, tonal sight singing?

- ○ Letter Names
- ○ Fixed-*Do* solfege
- ○ Moveable-*Do* solfege
- ○ Neutral syllables
- ○ Scale degree numbers

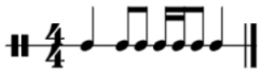
Q4.3 What solmization systems do you use *most often* for minor-key, tonal sight singing?

- ○ Letter names
- ○ Fixed-*Do* solfege
- ○ Moveable-*Do* solfege (tonic is *Do*)
- ○ Moveable-*Do* solfege (tonic is *La*)
- ○ Neutral syllables
- ○ Scale degree numbers (tonic is "1")
- ○ Scale degree numbers (tonic is "6")
- ○ I don't teach my students to sight-sing in minor.

Q4.4 Which system do you use *most often* for rhythmic sight singing?

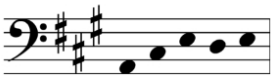
- ○ Gordon (Du-ta-de-ta Du-de)
- ○ Counting (1-e-&-a 2-e-&-a)
- ○ Kodaly (Ti-ka-ti-ka Ta-ti)
- ○ McHose-Tibbs (1-ta-te-ta 2-te)
- ○ Neutral syllables (noo, lah, bum, etc..)
- ○ Note value names (Quart eighth-note six-teen-six-teen)
- ○ Orff (Al-li-ga-tor Ap-ple - or other speech cue)
- ○ Takadimi (Ta-ka-di-mi Ta-di)
- ○ Tometics (1-ta-ne-ta 2-ne)

Q4.5 I teach rhythm patterns independent of pitch: e.g.



- ○ Never
- ○ Infrequently
- ○ Sometimes
- ○ Frequently
- ○ Very Frequently

Q4.6 I teach pitch patterns independent of rhythm: e.g.



- ○ Never
- ○ Infrequently
- ○ Sometimes
- ○ Frequently
- ○ Very Frequently

End of Block 4: Tonal and rhythmic

Start of Block 5: Aural

Q5.1 Aural training is an integral component of my sight-singing instruction.

- Never
- Infrequently
- Sometimes
- Frequently
- Very Frequently

Skip To: End of Block If Never
Skip To: End of Block If Infrequently

Q5.2 In this section, you will respond to statements about the aural instructional practices you use with your high school choirs to teach sight singing. You answers should reflect your best practices with all of your choirs, including beginning, intermediate, proficient, and advanced.

Q5.3 Students should exhibit mastery in aural skills before reading printed notation.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

Q5.4 The principle of "sound before sight" applies more to elementary-aged music students than to high-school aged music students.

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Q5.5 How often do you use the following aural training strategies as a part of your sight-singing instructional practices?

	Never	Infrequently	Sometimes	Frequently	Very Frequently
Listening (1)	○	○	○	○	○
Rote singing (2)	○	○	○	○	○
Imitation of a vocal demonstration (3)	○	○	○	○	○
Imitation of an instrumental demonstration (4)	○	○	○	○	○
Improvisation (5)	○	○	○	○	○
Dictation (6)	○	○	○	○	○
Interval training (7)	○	○	○	○	○

Q5.6 What other aural training strategies do you use as a part of your sight-singing instructional practices?

_____

End of Block 5: Aural

Start of Block 6: Kinesthetic

Q6.1 I use some type of movement (Curwen hand signs, walking to the beat, etc..) during my sight-singing instruction.

- ○ Never
- ○ Infrequently
- ○ Sometimes
- ○ Frequently
- ○ Very Frequently

Skip To: End of Block If Never
Skip To: End of Block If Infrequently

Q6.2 In this section, you will respond to statements about the types of movements you use to help teach you high school chorus students to sight sing. Your answers should reflect your best practices with all of your choirs, including beginning, intermediate, proficient, and advanced.

Q6.3 How often do you use the following kinesthetic activities in your sight-singing instructional practices?

	Never	Infrequently	Sometimes	Frequently	Very Frequently
Solfege (Curwen) hand signs (1)	○	○	○	○	○
Tracing the contour of the tonal line (2)	○	○	○	○	○
Conducting (3)	○	○	○	○	○
Patshing (4)	○	○	○	○	○
Clapping (5)	○	○	○	○	○
Tapping finger, foot, etc.. (6)	○	○	○	○	○
Walking (7)	○	○	○	○	○

Q6.4 What other types of kinesthetic activity do you use with your students to help teach sight singing?

_____

End of Block 6: Kinesthetic

Start of Block 7: Assessments

Q7.1 How often do you individually assess your students' sight-singing?

- ○ Never
- ○ Infrequently
- ○ Sometimes
- ○ Frequently
- ○ Very Frequently

Skip To: End of Block If Never

Q7.2 In this section, you will respond to questions concerning the use of assessments in your high school choral classroom to evaluate sight-singing. Your answers should reflect your best practices with all of your choirs, including beginning, intermediate, proficient, and advanced.

Q7.3 On average, how many times during the school year do you assess your students' ability to sight sing - both formally and informally?

_____

Q7.4 In what type of setting do you assess your students' sight-singing ability?

	Never	Infrequently	Sometimes	Frequently	Very Frequently
Alone - performed live for the teacher (1)	○	○	○	○	○
Alone - recorded in isolation (3)	○	○	○	○	○
Alone - recorded in whole group setting (4)	○	○	○	○	○
In small groups performed live for the teacher (5)	○	○	○	○	○
In small groups - recorded in isolation (7)	○	○	○	○	○
In small groups - recorded in whole group setting (8)	○	○	○	○	○

Q7.5 What other assessment procedures do you use to individually assess your students' sight singing?

_____

Q7.6 How often are the results of these assessments included in your students' final grade?

- ○ Never
- ○ Infrequently
- ○ Sometimes
- ○ Frequently
- ○ Very Frequently

End of Block 7: Assessments

APPENDIX D: GROUP FREQUENCY RATINGS, AURAL TRAINING STRATEGIES

Group *S* (*n* = 38) Frequency Ratings for Aural Training Strategies

Aural Training Strategy	Mean	SD	Rating Scale				
			1 *n* (%)	2 *n* (%)	3 *n* (%)	4 *n* (%)	5 *n* (%)
Imitation of Vocal Demonstration	3.95	.77	0 (0.0%)	2 (5.3%)	6 (15.8%)	22 (57.9%)	8 (21.1%)
Listening	3.74	.86	0 (0.0%)	3 (7.9%)	11 (28.9%)	17 (44.7%)	7 (18.4%)
Rote Singing	3.68	.81	0 (0.0%)	2 (5.3%)	14 (36.8%)	16 (42.1%)	6 (15.8%)
Interval Training	2.89	.89	0 (0.0%)	4 (10.5%)	17 (44.7%)	11 (28.9%)	6 (15.8%)
Dictation	2.89	.95	2 (5.3%)	10 (26.3%)	19 (50.0%)	4 (10.5%)	3 (7.9%)
Imitation of Instrument	2.39	1.10	8 (21.1%)	16 (42.1%)	6 (15.8%)	7 (18.4%)	1 (2.6%)
Improvisation	2.16	.96	7 (18.4%)	20 (52.6%)	10 (26.3%)	0 (0.0%)	1 (2.6%)

Note. 1 = *never;* 2 = *infrequently;* 3 = *sometimes;* 4 =*frequently;* 5 = *very frequently*

Group *F* (*n* = 51) Frequency Ratings for Aural Training Strategies,

Aural Training Strategy	Mean	SD	Rating Scale				
			1 ***n*** **(%)**	**2** ***n*** **(%)**	**3** ***n*** **(%)**	**4** ***n*** **(%)**	**5** ***n*** **(%)**
Imitation of Vocal Demonstration	4.14	.89	0 (0.0%)	4 (7.8%)	5 (9.8%)	22 (43.1%)	20 (39.2%)
Listening	3.94	.68	0 (0.0%)	1 (2.0%)	10 (19.6%)	31 (60.8%)	9 (17.6%)
Rote Singing	3.90	.76	2 (3.9%)	8 (15.7%)	23 (45.1%)	14 (27.5%)	4 (7.8%)
Interval Training	3.20	.94	0 (0.0%)	1 (2.0%)	14 (27.5%)	25 (49.0%)	11 (21.6%)
Dictation	3.14	.94	4 (7.8%)	4 (7.8%)	27 (52.9%)	13 (25.5%)	3 (5.9%)
Imitation of Instrument	2.55	.99	7 (13.7%)	18 (35.3%)	19 (37.3%)	5 (9.8%)	2 (3.9%)
Improvisation	2.39	.92	7 (13.7%)	24 (47.1%)	14 (27.5%)	5 (9.8%)	1 (2.0%)

Note. 1 = *never;* 2 = *infrequently;* 3 = *sometimes;* 4 =*frequently;* 5 = *very frequently*

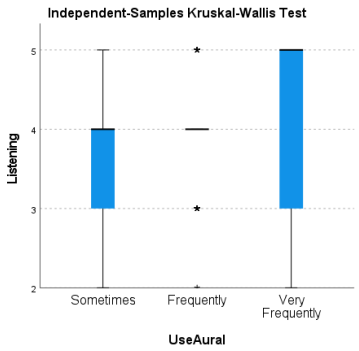
Group *VF* (*n* = 29) Frequency Ratings for Aural Training Strategies

Aural Training Strategy	Mean	SD	Rating Scale				
			1 ***n*** **(%)**	**2** ***n*** **(%)**	**3** ***n*** **(%)**	**4** ***n*** **(%)**	**5** ***n*** **(%)**
Interval Training	4.34	.77	0 (0.0%)	1 (3.4%)	2 (6.9%)	12 (41.4%)	14 (48.3%)
Imitation of Vocal Demonstration	4.17	1.00	0 (0.0%)	2 (6.9%)	6 (20.7%)	6 (20.7%)	15 (51.7%)
Listening	4.17	1.00	0 (0.0%)	2 (6.9%)	6 (20.7%)	6 (20.7%)	15 (51.7%)
Rote Singing	3.76	.95	0 (0.0%)	2 (6.9%)	11 (37.9%)	8 (27.6%)	8 (27.6%)
Dictation	3.71	.96	0 (0.0%)	4 (13.8%)	6 (20.7%)	13 (44.8%)	6 (20.7%)
Improvisation	2.79	1.08	2 (6.9%)	11 (37.9%)	10 (34.5%)	3 (10.3%)	3 (10.3%)
Imitation of Instrument	2.28	1.07	7 (24.1%)	12 (41.4%)	6 (20.7%)	3 (10.3%)	1 (3.4%)

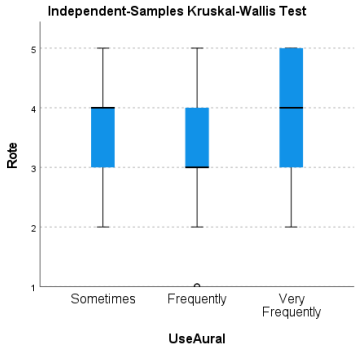
Note. 1 = *never;* 2 = *infrequently;* 3 = *sometimes;* 4 =*frequently;* 5 = *very frequently*

APPENDIX E: BOXPLOTS FOR FREQUENCY RATINGS OF AURAL STRATEGIES

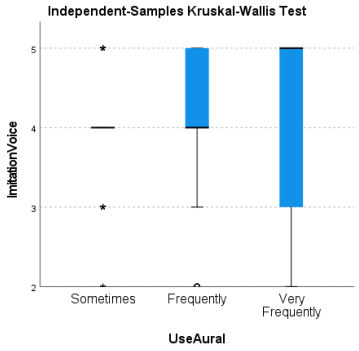
Listening



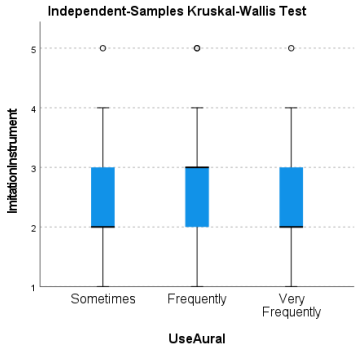
Rote Singing



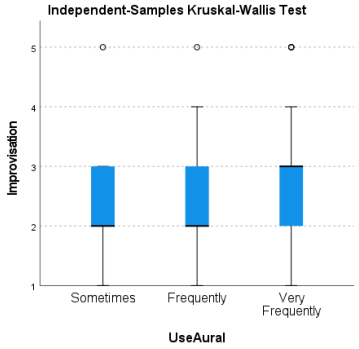
Imitation of a Vocal Demonstration



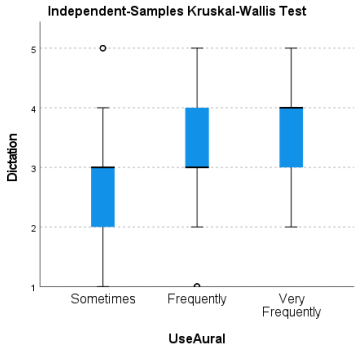
Imitation of an Instrumental Demonstration



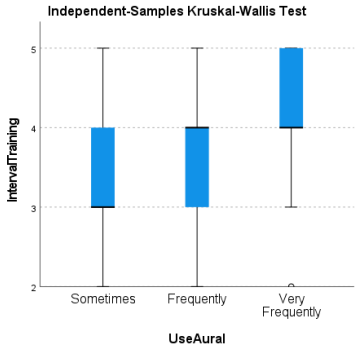
Improvisation



Dictation



Interval Training



APPENDIX F: OTHER AURAL TRAINING STRATEGIES LISTED BY PARTICIPANTS

1. “All parts read each vocal line in own register”
2. “Intervals and chords on solfège”
3. “Intervals, echoing patterns, rhythmic and melodic dictation”
4. “We play competitive solfège games to train the ear and teach audition. The activity is scaffolded with different features to make it more difficult once student show mastery in one approach. We explore pattern identification and recognition to build ear training skill set and assist in understanding pitch relationships.”
5. “I use Adam Paltrowitz's Aural Training sheet from choral clarity.com “
6. “Interval comparison to familiar melodies “
7. “Imitating pitch patterns”
8. “I sing something incorrectly and ask students to identify pitch and/or rhythmic errors”
9. “A Capella singing and sight reading “
10. “Sight reading factory”
11. “Chord quality identification “
12. “Writing in solfège for new pieces”
13. “Scale understanding”
14. “Repetition of common solfège patterns (Do Mi Sol, Fa La, Re Ti, etc.)”
15. “Composition”
16. “I use www.musictheory.net for interval training and ear training “
17. “Individual keyboards”
18. “Tuning fork exercises to find starting pitches for sight reading exercises.”
19. “Scales and arpeggios “
20. “Error detection”
21. “Vocal-pitch exercises”
22. “Matching games from iconic to notation”
23. “Echo patterns. NS(3 syllable) to NS. TaKaDiMi to TaKaDI. Then NS to TaKaDiMi”
24. “Student vocal models for the class”
25. “Chord identification”
26. “I allow my students to take turns leading sight reading exercises”
27. “Translate from neutral to solfège/takadimi”
28. “Translating neutral to syllables”
29. “Memorization of common pitch and rhythm patterns and sequences”
30. “Ear training”
31. “Steady beat exercises”

APPENDIX G: GROUP FREQUENCY RATINGS, KINESTHETIC STRATEGIES

Group *S* (*n* = 14) Frequency Ratings for Kinesthetic Strategies

Kinesthetic Strategy	Mean	SD	Rating Scale				
			1 ***n*** **(%)**	**2** ***n*** **(%)**	**3** ***n*** **(%)**	**4** ***n*** **(%)**	**5** ***n*** **(%)**
Solfège (Curwen) Hand Signs	3.79	1.19	1 (7.1%)	1 (7.1%)	2 (14.3%)	6 (42.9%)	4 (28.6%)
Conducting	3.21	1.12	1 (7.1%)	1 (7.1%)	9 (64.3%)	0 (0.0%)	3 (21.4%)
Tapping Finger, Foot, etc.	3.14	1.03	0 (0.0%)	4 (28.6%)	6 (42.9%)	2 (14.3%)	2 (14.3%)
Clapping	3.07	.92	0 (0.0%)	4 (28.6%)	6 (42.9%)	3 (21.4%)	1 (7.1%)
Patsching	2.93	1.21	2 (14.3%)	2 (14.3%)	7 (50.0%)	1 (7.1%)	2 (14.3%)
Walking	2.64	1.15	2 (14.3%)	5 (35.7%)	4 (28.6%)	2 (14.3%)	1 (7.1%)
Tracing the Contour of the Tonal Line	2.21	.58	1 (7.1%)	9 (64.3%)	4 (28.6%)	0 (0.0%)	0 (0.0%)

Note. 1 = *never;* 2 = *infrequently;* 3 = *sometimes;* 4 =*frequently;* 5 = *very frequently*

Group *F* (*n* = 33) Frequency Ratings for Kinesthetic Strategies

Kinesthetic Strategy	Mean	SD	Rating Scale				
			1 *n* (%)	2 *n* (%)	3 *n* (%)	4 *n* (%)	5 *n* (%)
Solfège (Curwen) Hand Signs	4.39	.75	0 (0.0%)	1 (3.0%)	2 (6.1%)	13 (39.4%)	17 (51.5%)
Tapping Finger, Foot, etc.	3.42	1.23	3 (9.1%)	5 (15.2%)	6 (18.2%)	13 (39.4%)	6 (18.2%)
Clapping	3.39	1.30	3 (9.1%)	6 (18.2%)	7 (21.2%)	9 (27.3%)	8 (24.2%)
Conducting	3.30	1.02	2 (6.1%)	4 (12.1%)	12 (36.4%)	12 (36.4%)	3 (9.1%)
Tracing the Contour of the Tonal Line	3.06	.90	1 (3.0%)	7 (21.2%)	16 (48.5%)	7 (21.2%)	2 (6.1%)
Patsching	3.06	1.54	8 (24.2%)	5 (15.2%)	5 (15.2%)	7 (21.2%)	8 (24.2%)
Walking	2.97	1.10	4 (12.1%)	6 (18.2%)	12 (36.4%)	9 (27.3%)	2 (6.1%)

Note. 1 = *never;* 2 = *infrequently;* 3 = *sometimes;* 4 =*frequently;* 5 = *very frequently*

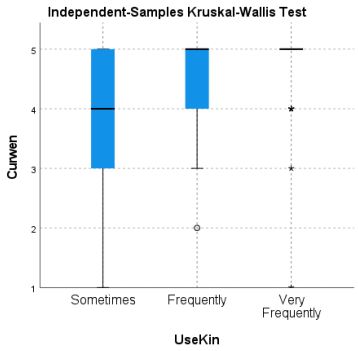
Group *VF* (*n* = 64) Frequency Ratings for Kinesthetic Strategies

Kinesthetic Strategy	Mean	SD	Rating Scale				
			1 ***n*** **(%)**	**2** ***n*** **(%)**	**3** ***n*** **(%)**	**4** ***n*** **(%)**	**5** ***n*** **(%)**
Solfège (Curwen) hand signs	4.81	.61	1 (1.6%)	0 (0.0%)	1 (1.6%)	6 (9.4%)	56 (87.5%)
Patsching	3.92	1.45	8 (12.5%)	4 (6.3%)	9 (14.1%)	7 (10.9%)	36 (56.3%)
Conducting	3.58	1.11	1 (1.6%)	9 (14.1%)	25 (39.1%)	10 (15.6%)	19 (29.7%)
Tapping Finger, Foot, etc.	3.36	1.21	6 (9.4%)	9 (14.1%)	17 (26.6%)	20 (31.3%)	12 (18.8%)
Tracing the Contour of the Tonal Line	3.30	1.27	7 (10.9%)	10 (15.6%)	17 (26.6%)	17 (26.6%)	13 (20.3%)
Walking	3.02	1.21	9 (14.1%)	10 (15.6%)	25 (39.1%)	11 (17.2%)	9 (14.1%)
Clapping	2.66	1.36	17 (26.6%)	14 (21.9%)	15 (23.4%)	10 (15.6%)	8 (12.5%)

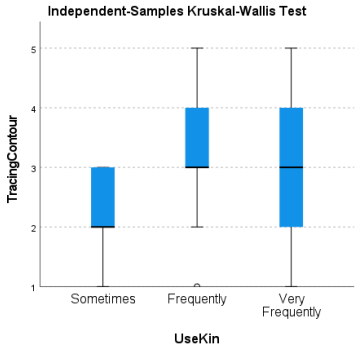
Note. 1 = *never;* 2 = *infrequently;* 3 = *sometimes;* 4 =*frequently;* 5 = *very frequently*

APPENDIX H: BOXPLOTS FOR FREQUENCY RATINGS OF KINESTHETIC STRATEGIES

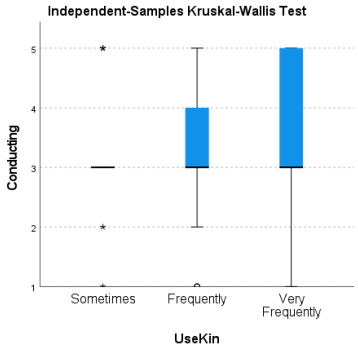
Solfege (Curwen) hand signs



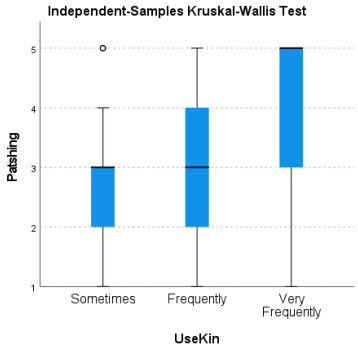
Tracing the contour of the tonal line



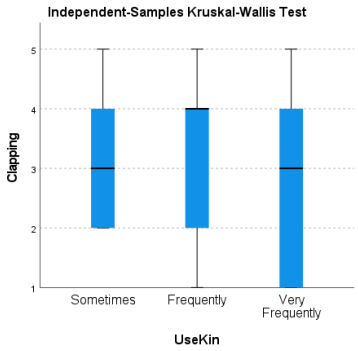
Conducting



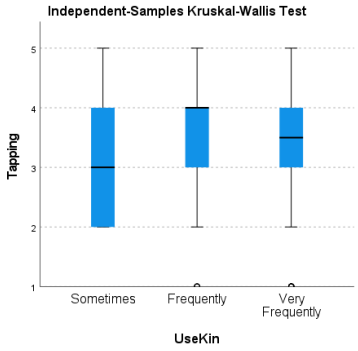
Patsching



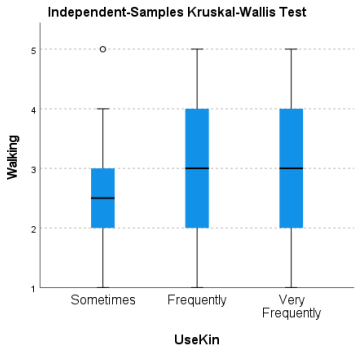
Clapping



Tapping finger, foot, etc.



Walking



APPENDIX I: OTHER KINESTHETIC STRATEGIES LISTED BY PARTICIPANTS

1. “Body solfège”
2. “Changing direction with phrase of listening, body solfège”
3. “Group interactive movements”
4. “Movement of hands to indicate long and short durations”
5. “Moving right to left to keep beat”
6. “Moving to the meter, like having a different movement for each beat”
7. “Swaying, rocking, tap your neighbor, etc.”
8. “Visualization; stairs metaphor for scale degrees”
9. “Whole body positioning sitting to standing with arms raised whole group and as sections indicating melodic direction of each voice part's vocal line”

APPENDIX J: ASSESSMENT PROCEDURES LISTED BY PARTICIPANTS

1. “Dictation”
2. “Evaluating each other”
3. “Nonverbal visual of hand symbols”
4. “Use of solfège while sight reading”
5. “Written assessments to identify whether difficulties are aural or visual”
6. “Written work with solfège and rhythm counting, have students ‘show work’”

APPENDIX K: PARTICIPANT REPORTED FREQUENCY OF FORMAL AND INFORMAL ASSESSMENTS

1. “A few times a month.”
2. “Almost daily.”
3. “Almost daily informally. 4 times a year formally.”
4. “As a group about every other week.”
5. “As a group, daily. individually, infrequently.”
6. “At least twice a grading period.”
7. “Daily informal assessments and weekly or bi-weekly formal assessments.”
8. “Every other day in a class setting - individually 8 times per year.”
9. “Every other week via sightreadingfactory.com.”
10. “Everyday as a group. Individually about 4 times.”
11. “Formally-weekly informally – daily.”
12. “Formally, every three weeks informally, daily.”
13. “Individually, never. As a group, informally daily.”
14. “Informally assessments occur daily; formal assessments each semester.”
15. “Informally daily, formally 2-3 times a year.”
16. “Informally- daily, formally- 1 time a quarter.”
17. “Informally-about every other day. Formally maybe twice during the semester.”
18. “Informally, 4 times a week, formally not so often.”
19. “Infrequently.”
20. “Not often, however this will change this year because all chorus students have an individual account to sight reading factory.”
21. “Regularly throughout the semester.”
22. “Several times a week.”
23. “Too many to count.”
24. “Very rare on individual assessments.i don't have time since I meet my HS group only twice a week. So - probably 4 times.”
25. “Weekly to bi-weekly.”