Audiation and the Study of Singing

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AUDIATION AND THE STUDY OF SINGING

By

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ABSTRACT

Audiation is the ability to hear and to comprehend music when the sound is not physically present. The principle of audiation is outlined by Edwin E. Gordon in his Music Learning Theory, which is a research-based explanation of how people learn and process music. The primary conclusion of this research is that the ability to audiate is the most fundamental factor in developing musicianship. Gordon’s research and theory have been applied in the field of music education for many years, but have yet to be recognized by the field of vocal pedagogy.

The purpose of this treatise is to introduce the principle of audiation and Music Learning Theory to voice teachers and singers, and to provide suggestions for application to the voice studio. It is the author’s belief that knowledge and understanding of audiation will provide voice teachers with the ability to enhance the musical and vocal development of voice students.
CHAPTER 1

INTRODUCTION

The history of trained singers is one full of colorful stories about the behavior of singers in the musical world. Based on this history, there are many stereotypes that exist about classically trained singers. Stories of opera singers who never learned to read music and ignorant young singers who expect their accompanists to teach them their pitches abound.¹ Singers in general have had trouble earning the right to call themselves musicians, because many singers lack the skills that allow them to be musically independent.

In today’s world, weak musicianship is not tolerated. Singers are expected to be excellent musicians if they plan to work professionally.² Still, the training that young singers receive often focuses on vocal skill alone and leaves them to their own devices when it comes to music reading and aural skills. Compounding the problem is the fact that singers often do not discover their vocal talents until their teens and are not encouraged to study privately until the middle to late teens. While the approach may be appropriate for the young singer’s physical development, it may cause a delay in musical development. Often, singers that have strong musicianship skills began instrumental study at an earlier age, giving them a sizable advantage over those who did not begin formal musical studies until adolescence or later.³

The majority of singers who become college voice majors have been involved in choral music and some have received private voice instruction during their high school education. To the credit of the educators involved in training these students, the young singer often comes into


the university environment with some singing skills and a love of the vocal arts. Unfortunately, fundamental musicianship skills are too often not a part of a singer’s training in pre-college study. In vocal music education settings, formal training in aural skills, basic music theory and music reading are often addressed minimally or with limited effectiveness. For example, a study by E. Thayer Gaston found that out of 250 students in 10 high schools, none could sight-read a fifth-grade level melody. Studies also show that success in group sight-singing does not guarantee individual success.

A review of studies on the teaching of comprehensive musicianship in secondary ensembles by James Austin states, “Research on teaching practices shows that instrumental and choral ensemble instructors do not typically employ strategies or address objectives that will result in a comprehensive education and musical independence for their students. The vast majority devote their time to traditional performance objectives that may or may not be compatible with the development of comprehensive musicianship.” This is due in large part because so many secondary music programs are performance driven. Concerts and competitions become the priority and the process of learning is an afterthought. A choir may sing a beautiful performance of a work for a competition that has essentially been rote taught over a period of time, leaving the students with a high level aesthetic experience, but few musical skills that will transfer to learning another piece more independently. This type of teaching may provide an excellent performance product and merit high ratings at festivals and competitions, but the students do not learn a process for music making which they can retain and develop as individuals. Unfortunately, this type of product-oriented teaching is also common in the area of private vocal instruction.

A common scenario in the voice studio at the high school level is as follows: the teacher assigns a student an art song, then proceeds to introduce the song by playing or singing the melody for the student into a tape or compact disc recorder. The student is then told to take the

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recording home and learn the song. This method may result in instant vocal gratification for the student and teacher as the song can become performance ready very quickly, but the student is deprived of the opportunity to gain the valuable skill of learning a song independently and developing music literacy. Again, the student may learn to sing the song beautifully and even win a competition, but a disservice is being done to the student for the sake of an end product.

Both of the aforementioned educational settings have the opportunity to capture young students’ attention and teach them musicianship skills that will be with them for their entire life. This opportunity is sacrificed so that a chorus or an individual can wear a medal on their school jacket, or worse, simply because these important skills are viewed to be too much trouble. Of course, there are many vocal music educators in both areas that produce students who are well versed in the fundamentals of musicianship, but more often, the choir director believes that the voice teacher should be teaching these skills and the voice teacher feels the student should have learned the skills in school, and neither chooses to make it a top priority. In the end, the students leave these teachers with many wonderful memories of their musical experiences, but without the tools to continue on as independent musicians.

The process of teaching students to become musically independent is certainly not an easy one. In addition to the reasons mentioned above, the difficulty of this task causes teachers to be unwilling or unable to provide students with these important skills. There is a strong need for the development of a sequential system with which vocal music teachers can teach their students to become independent musicians. Fortunately, the foundation for such a system has been laid out in the work of Edwin E. Gordon.

The field of vocal pedagogy has in the last several decades undergone a great paradigm shift from a strictly empirical, subjective field to a more scientific, objective one. The reason for this has been the great improvements in scientific knowledge of the voice and how it functions during the act of singing. Voice teachers who wish to stay current and command respect from colleagues are expected to have a working knowledge of vocal function in addition to excellent musical training and performance skills. Many teachers have become skilled at diagnosing and correcting vocal faults, sometimes with dramatic results. As a result of this large knowledge base, it is arguable that more singers are being trained to sing with a solid technical foundation. However, there remains an area of the singing process that has been relatively underrepresented in research and discussions in the field: the singer’s musical ear.
Sergius Kagen in his book, *On Studying Singing*, states “The very first prerequisite which a student with professional ambition must possess is a specific variety of a very keen musical ear. The entire process of singing rests upon this. This specific variety of musical ear is the cornerstone of singing. Without it everything else is useless.” Kagen’s statement highlights the importance of a developed musical ear in successful vocal study, and it would be difficult to find a voice teacher who would argue against this importance. However, the question remains: what exactly is this elusive musical ear and how is it obtained? Is the musical ear simply an innate talent or is it a skill that can be developed with proper training? This author would argue that it is a combination of “nature” and “nurture”. This statement can be supported by the research and writings of noted music education researcher, Dr. Edwin Gordon.

Gordon’s forty years of research has focused on a principle directly related to the development of the so-called musical ear. To describe this principle, Gordon coined the term *audiation*. The most basic definition of audiation is “the ability to hear and to understand music for which the sound is not immediately present or may never have been physically present.” If one is audiating a song, one is hearing all of the musical elements in the imagination without the need to play it on an instrument or make vocal sounds. Audiation may also occur as forward thought during the act of singing and in many other ways that will be explained in this treatise. Gordon’s work describes audiation as the single most important factor in the development of musicianship. It is the application of the principle of audiation to the process of studying singing that is of primary interest in this treatise.

The principle of *audiation* is the basis for Gordon’s primary contribution to the field of music education, Music Learning Theory. Music Learning Theory is an explanation of how people learn music initially developed by Gordon while studying music aptitude in the 1960s and 1970s. Gordon’s text, *Learning Sequences in Music: Skill, Content, and Patterns*, originally published in 1980, fully explains the theory. This text explains the ideal conditions for music learning in depth and outlines a prescribed sequence of content and instruction for the development of audiation called Learning Sequence Activities (LSA).

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LSA are imitative tonal and rhythmic pattern activities. These activities are published in a manual and register book series that is part of *Jump Right In: The Music Curriculum.* The use of LSA, as intended by Gordon, ensures that students are led through the proper sequence of skills and content areas to maximize the development of audiation, which is the key to the education of independent musicians. It is the author’s belief that the incorporation of LSA and other audiation-based exercises would lead to significant audiational development in young singers, bringing them closer to the goal of musical independence. Furthermore, the principle of audiation also has applications for more advanced singers beyond the realm of music literacy. Singers who audiate well are more likely to achieve success in the technical and artistic realms of singing. Simply stated, if one can imagine the music being sung with great clarity, it is much easier to execute that music without interference.

The development of audiational skills will not only improve the singer's musical ear and overall musicianship but can have an effect on retention of technical information. It is the author’s belief, that as the student’s audiation improves, the student becomes more aware of what is happening physically while singing. The improved internal thought processing will allow for the singer to be more outwardly aware, and therefore retain critical information such as assessments of sound and sensation.

Young singers often lack thoughtful preparation before the act of singing - hence the frequent admonishments "hear the pitch before you sing" or "hear the phrase as you breathe." These are both audiation skills that must be developed. However, many students may not possess the skills necessary to audiate an entire phrase accurately. Furthermore, many teachers of singing do not have an understanding of how to teach the skills of audiation.

The goal of improving audiational skill in singers is to allow the student to understand the music well enough to hear in the mind's ear what is to be sung and then focus the attention on allowing the body to sing the phrase. When the understanding of the music is not clear, or the student is not audiating, the singer will resort to other measures to feel secure about the musical content about to be sung. Examples of these measures might include lifting the eyebrows to "raise the pitch", or bobbing the head with the beat in order to feel more secure of the rhythmic content. Perhaps the most detrimental habit is the tensing of the laryngeal muscles in order to

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feel the pitch a certain way since they cannot simply audiate it. This may be the result of the student trusting muscle memory more than audiation. The teacher may be successful in pointing out these compensatory measures as extraneous tensions that need to be released, but the core of the problem, a lack of audiation, will not have been dealt with.

Traditional musical training reinforces these compensatory measures because of the lack of focus on audiation. Instead, the focus of most musical training in schools is on notation and the decoding of that notation. If choirs learning a new piece were taught to audiate their part before attempting to sing through it, many of the compensatory measures taught to correct the flaws (i.e. raising the eyebrows, "throat memory") would be unnecessary.

Audiational skill is something that can be developed in singers of all levels. The specific skills and types of audiation that need to be taught to an eighteen year old freshman will be different from those required by a 25 year old graduate student, but the principle is the same. The needs of each student can be assessed informally in the way that they prepare music and sing it in lessons. For instance, if the student is unable to learn a song independently, then it is clear that notational audiation, or audiation while reading music, needs to be taught and reinforced. Or, if an advanced student is having difficulty creating ornaments for a baroque aria or writing out a cadenza, then the skills of improvisation and notational audiation in its written form should be addressed. Additionally, formal testing of music aptitude and music achievement levels will provide a teacher with a wealth of information about the student’s needs.

The voice teacher has the unique opportunity as well as the responsibility to tailor instruction based on each student’s needs. Voice teachers are generally quite good at assessing a student's technical needs and vocal flaws, however it is arguable that most teachers are unaware of the student's specific needs as a musician. Music aptitude and music achievement testing provide the teacher with a great deal of information about student's innate abilities, as well as how far along they are in their musical development. Many teachers and students likely become frustrated when the teacher’s assumptions about a student’s musical abilities are incorrect. For instance, the teacher’s expectation of a college freshman's level of music literacy and the student’s actual level can often be far distant. Testing and subsequent evaluation of the results will give the teacher a clear picture of what the student needs and allow a curriculum specific to that student to be created. Variables would include choice of tonal and rhythmic exercises, vocalise work, as well as repertoire selection. It is quite possible, without this information, for a
teacher to assign repertoire that is above or below the student’s capabilities. For example, a student with modest rhythmic aptitude who achieved poorly in rhythmic content on a music literacy test would likely have great difficulty with a piece that contains complex rhythms or quickly shifting meters.

The primary goal for this treatise is to help voice teachers understand the principle of audiation and its effects on the process of singing. It is the author’s hope that, given a greater understanding of how singers audiate and understand music, voice teachers will gain a sizeable addition to the tool kit with which they teach.
CHAPTER 2

MUSIC LEARNING THEORY

In order to understand fully how audiation and Music Learning Theory can contribute to the development of singing and musicianship, it is necessary to have a working understanding of the theory and its components. Edwin Gordon developed his Music Learning Theory as a result of many years of research on music aptitude, or music learning potential. After years of exhaustive and thorough research on aptitude, Gordon began to put together an explanation of how people learn music. It is important to emphasize that the music learning referred to here is performance skill, not appreciation. In other words, the matter at hand is how people learn to participate in music rather than learn about music in the more passive sense. This body of research first culminated in the publication of Gordon’s book *Learning Sequences in Music: Skill, Content, and Patterns*. This text, as the title describes, provides a sequential process by which music content and skill can be taught most efficiently and effectively. The foundation of this process is a sequence of tonal and rhythmic pattern activities called Learning Sequence Activities (LSA).

According to Gordon, LSA should be a part of every general music class, ensemble rehearsal, and private lesson that involves musicians still in the developmental stages of audiation. In the purest form, each class would begin with 7-10 minutes of interactive pattern instruction. Both tonal and rhythmic content should be addressed in each class period, but only one area of content should be dealt with (major or minor tonality, duple or triple meter). In practice, many teachers have found this process somewhat cumbersome and have adapted it to meet the needs of their students in many different ways.\(^\text{10}\) Only one existing study cites the use

of LSA in the applied voice lesson. Diane Clarke introduced LSA to her college voice studio in an informal case study and found students enjoyed the musical challenge and felt it assisted their musical development.\textsuperscript{11} However, no formal testing or observations were done to show the effectiveness of this type of instruction. It is likely that most voice teachers would be hesitant to spend this amount of time in every lesson on LSA. An adaptation for the use of LSA in the applied lesson is suggested in the practical applications section of this treatise.

**Discrimination vs. Inference Learning**

The two generic types of music learning theory are discrimination learning and inference learning. Discrimination learning is essentially rote learning. Students are taught skills, content, and patterns by rote. Gordon states:

Discrimination learning is the basis for the development of audiation skill. Discrimination learning includes perception, sensation, and audiation. We perceive in discrimination learning when we take in information from our environment through our senses, as when we listen to music being performed. We sensate in discrimination learning when we physically feel what we perceive, as when we sing, chant, and move. We audiate in discrimination learning when we silently recall or create music, as when we silently recall patterns that we have perceived and sensated or when we silently create with patterns that we may or may not have perceive or sensated.\textsuperscript{12}

In inference learning, the teacher guides students to learn skills, content, and patterns by teaching themselves. Both types of music learning contain subtypes. The full skill learning sequence in Music Learning Theory is comprised of the two types of learning and all the subtypes. They are outlined in the Table 1 below.\textsuperscript{13}

\begin{itemize}
  \item \textsuperscript{12} Gordon, Learning Sequences in Music: Skill, Content, and Patterns, 21.
\end{itemize}
Table 1

MUSIC LEARNING THEORY

**Discrimination Learning**
- Aural/Oral
- Verbal Association
- Partial Synthesis
- Symbolic Association
- Composite Synthesis

**Inference Learning**
- Generalization
- Creativity and Improvisation
- Theoretical Understanding

**Content Areas – Tonal and Rhythmic**

The focal point of the skill learning sequence is to develop audiation skill in the two primary areas of musical content: tonal and rhythmic. It is important to note that this does not mean that other areas of musical content such as phrasing, style, and dynamics are to be ignored until tonal and rhythmic content are mastered. The two primary areas have been shown to be fundamental to musical development and are also measurable skill areas, hence the focus on only two musical elements.

Another crucial aspect to the skill learning sequence is the separation of elements during LSA. In order to focus exclusively on developing audiation in each content area, the elements must be taught separately. For instance, when tonal patterns are delivered, they should not be sung in a specific rhythmic context. Also, they should be performed with time between each pitch in order to give the listener time to audiate each pitch being sung. Of course, rhythm is, in reality, always present, but what is important is that durations of pitches in each pattern be similar so that the student does not begin to focus on the rhythmic element of the pattern. Similarly, rhythmic patterns should be chanted without specific pitch content. The separation of elements will be discussed in the Practical Applications chapter of the treatise.
The basic level of music learning involves developing listening and singing skills using music’s fundamental functional vocabulary – tonal and rhythmic patterns. In this stage, students listen to and perform tonal and rhythmic patterns on a neutral syllable to begin developing fluency in musical language. According to Gordon, this is done during Learning Sequence Activities, and also during other musical activities, such as in alternation with song repertoire. During Learning Sequence Activities, the teacher establishes tonality or meter and focuses exclusively on call and response pattern instruction. The skills and content learned in LSA can and should then be transferred into the more realistic musical context of a song by alternating performance of the full song or individual phrases with simple call and response patterns in the tonality or meter of the repertoire being studied. The following sequence is an example of how this can be implemented at this most fundamental level.

Step 1: Teacher performs the song, “My Bonnie Lies Over The Ocean” in F Major.
Step 2: Teacher performs the song again, this time stopping after each phrase and singing a tonic major pattern such as mi so do on a neutral syllable; student echoes patterns.
Step 3: Teacher and student perform the song together, but stopping to echo patterns.
Step 4: Student performs song in solo.

Notice that this process involves no labeling or analyzing. Discrimination learning requires that no attempt be made by the teacher to skip ahead and explain the process theoretically regardless of the age of the student or students. The above example is clearly extremely elementary and would not often need to be employed to deal with major tonality or duple meter in a typical voice student. However, if a more advanced tonality or meter is being taught and the student does not have a working vocabulary or has limited understanding of that area of musical content, the process should theoretically begin at the aural/oral level. An example of this would be teaching 7/8 meter. Rather than beginning with a theoretical explanation of beats in a measure and note values, the correct sequence according to MLT would be to begin with call and response patterns in this unusual meter. Since it is unlikely that even a college freshman has extensive experience with mixed meter, it would be appropriate to begin with patterns on a neutral syllable to develop the student’s vocabulary for unusual meter before
asking the student to analyze it theoretically. So, the label aural/oral means students are simply developing listening and singing skills with no notation involved.

**Verbal Association**

Once students develop this fundamental vocabulary of musical content, they are ready to begin dealing with labels. However, this is still discrimination learning, so they learn the labels by rote without notation or explanation. The labels used in Music Learning Theory are solfege syllables for both tonal and rhythmic patterns. So, at the verbal association level, the same call and response technique used in the aural/oral level applies, but the teacher uses solfege syllables and students echo back with solfege. This begins to develop a solfege vocabulary for tonal and rhythmic content.

The type of solfege used is very specific for both tonal and rhythmic content. Gordon insists on the use of movable *do* with a *la*-based minor for tonal patterns. The reason for the use of this system is the emphasis on tonal context. This means that in major, the tonic or resting tone is always *do*, no matter what the key. Similarly, in minor, the tonic is always *la*. For those used to *do*-based minor, this seems unusual until one examines the natural order of whole tones and semi-tones in each scale. Natural major, or Ionian mode, is C because we can achieve a major scale with no accidentals. Natural minor, or Aeolian mode, is A for the same reason. This allows for a minimal use of chromatic solfege syllables. This system also accommodates more unusual modes such as Mixolydian, Dorian, and Phrygian easily using the same principle.

For rhythmic content, Gordon and colleagues James Froseth and Albert Blaser created a system of rhythmic solfege that is based on beat functions rather than on notation. In this system, the pulse that is felt in movement as the large beat, or macrobeat, is always *du*. The syllables for the small beats, or microbeats, change according to meter. In duple meter, microbeats are *de* and in triple meter they are *da* and *di*. The subdivision of the microbeat in all meters is *ta*. It is important to reemphasize that this system is not based on notation but on audiation. Therefore, a pattern or passage that is in triple meter that could be notated in a variety of ways would always be performed in rhythmic solfege the same way, based on the way we feel the beat function.
Incidentally, voice teachers will find it convenient that both tonal and rhythmic solfege syllables use spellings that parallel the International Phonetic Alphabet. For example, the rhythmic syllables for triple meter are spelled *du da di* and pronounced [du da di]. So, as students are using the solfege system, they are actually practicing correct vowel and consonant sounds as well.

**Rhythmic Syllables – Duple Meter**

![Duple Meter Rhythmic Solfege Examples](image1)

**Rhythmic Syllables – Triple Meter**

![Triple Meter Rhythmic Solfege Examples](image2)

Figure 1, Rhythmic Solfege Examples.

**Partial Synthesis**

At this level, students can begin to synthesize content and bring another level of meaning to their audiation. The basic premise of partial synthesis is that the teacher teaches students some of the basic labels that relate to what they are audiating. So, the terms major and minor and duple and triple are taught through LSA and coordinated activities. Because the students have been introduced to solfege, the syllables are used to facilitate learning new labels. For instance, in tonal content, the teacher would sing one major pattern and one minor pattern. Students would be asked, “Are you audiating *do, mi and so* or *la, do, and mi*? Patterns using *do, mi, and so* are called *major,* and patterns using *la, do, and mi* are called *minor.*” The same principle can be applied in rhythmic content: patterns with *du* and *de are duple,* patterns with *du, da, and di are triple.* Note that all information is still taught by rote at this level, so it is still discrimination learning.
Symbolic Association

At the symbolic association level of the learning sequence, notation is introduced. The students’ working vocabulary of patterns and syllables is now applied to bring meaning to notation, much like students who are learning to read in their native language already have a working vocabulary of spoken language. Students are simply shown the patterns they can already audiate as they perform them. In this sense, it is a process of recognition, not decoding note names.

In symbolic association, students learn to read and write notation through audiation. Hence, this skill is called notational audiation. While the students are reading and writing notation, this does not mean it is necessary for them to be well versed in music theory or traditional music terms. The use of solfege serves the only real need for labels at this point. So, note letter names and rhythmic value names are not used at this level of the learning sequence.

Composite Synthesis

At the partial synthesis level of learning, students are able to give syntax to a series of familiar tonal or rhythmic patterns with labels such as *duple* or *major*. In composite synthesis, students read and write a series of tonal and rhythmic patterns with the ability to identify the tonality or meter of the series.\(^\text{14}\)

Generalization

This is the first level of inference learning, meaning that students begin to audiate unfamiliar patterns by comparing them to familiar patterns learned in discrimination learning. Generalization, therefore, includes three sublevels that correspond to the levels of discrimination learning. At generalization-aural/oral, students indicate whether two tonal or rhythmic patterns are the same or different. At generalization-verbal, the student is sung a pattern without syllables and asked to sing the pattern with correct solfege. At generalization-symbolic level, students read unfamiliar patterns and write unfamiliar patterns from dictation.

Creativity/Improvisation

In this level of the learning sequence, students begin to perform with skills that indicate true musical fluency. As in language learning, when a child can express ideas based on a large vocabulary and syntax built over a long period of time, in music learning students can create new or unfamiliar patterns based on a defined or undefined syntax. For example, in creativity activities, when the teacher sings a tonal pattern, rather than echoing, the student responds with a completely different pattern of the student’s own creation, much like a musical conversation. In improvisation, the students are given restrictions on the responses. For example, the teacher might sing a tonic pattern and ask the student to respond with a dominant pattern.

Theoretical Understanding

This is the highest level of inference learning. Music theory is to music what grammar and linguistics are to language. It explains why music is audiated, performed, read, and written as it is. Theoretical understanding can strengthen the skills learned in the earlier levels of the sequence but cannot replace the skill content. If music theory is taught before students can audiate the musical content being studied, this is akin to students being taught grammar before they can think in complete sentences. At this level, students learn information commonly taught in traditional methods as a readiness for music reading, such as the names of lines and spaces, rhythmic value names, sharps and flats, time signatures and so on. It may be alarming to those of us who have been taught with traditional methods that these seemingly basic musical concepts are not included earlier in the sequence. However, these theoretical ideas have no affect on how music is actually audiated. To further the comparison with language learning and practice, it is possible for someone to be an excellent writer of literature without knowing the rules of grammar. Similarly, it is quite possible for someone to be a fine musician without knowing music theory. This is not to say that it should not be taught, but that it should be there to help further understanding and audiation, not be placed before them.

Given this overview of Music Learning Theory and its levels, it should be clear that it is not within the scope of this paper to apply every level of the theory to the voice lesson scenario. Rather, the purpose here is to take the most salient information from this theory and apply it toward the improvement of vocal music instruction. As Gordon states, it is the principle of
audiation that is most fundamental to this entire process, so it is the principle of audiation that shall be more closely examined in the chapter to follow.
AUDIATION

Audiation is best described as the ability to hear and to comprehend music when the sound is not physically present. Audiation can occur actively during music listening, performing vocally or on an instrument, conducting, composing and improvising. Audiation is to music what thought is to language. We think in silence, or as we listen to someone speak, but continue to think and process meaning in language as we are engaged in conversation, or in delivering a speech, for example. Similarly, we audiate in silence or while listening to music and continue to audiate while performing music in an ensemble or in solo.

Our brains process language and speech in a very complex and efficient manner. Fine musicians process music in a similar manner. In fact, it has been shown through functional MRI studies by David Levitin and his peers that we process music and language in the same region of the brain.\(^\text{15}\) So, if the brain processes language and music similarly, it makes sense that we learn language and music similarly.

The most fundamental ideas about how audiation is developed can best be explained with a comparison of music learning to that of language learning. Most singers are aware of the difficulty of learning a language that was not spoken to them in their upbringing. The reason for this difficulty can be attributed to the lack of acculturation to that language in the formative years. During early childhood, the human brain is busy forming billions of synaptic connections for cognitive processing. The quality and quantity of these connections is dependent upon the child’s environment and interaction within that environment. During this developmental period, from birth to approximately age nine, the connections are soft-wired and flexible and continue to be made. After age nine, the brain connections become hard-wired. Obviously, this does not

mean that learning ceases, but it does mean that the pathways for thought are fixed and all further
learning must occur through the established connections. Therefore, if a second language is not
part of this initial acculturation stage of development, one lacks an efficient hard-wiring for
acquiring that language as an older child or in adulthood.

A brief examination of how one’s native language is learned will be useful in drawing the
comparison to music learning. Infants are immersed in an environment of language from their
first minutes of life. Parents and relatives talk to the child and converse with one another with no
expectation of verbal response from the child. As the baby grows, he or she begins to
experiment with vocal sounds in an effort to communicate. These babbling sounds begin to take
on meaning and eventually a vocabulary of basic words and phrases is formed. In the preschool
years, the child becomes fluent in the spoken language of the parents. The child is developing
the ability to think in that language. It is only after the child has a working vocabulary and is
able to communicate with adults that the child is expected to begin to learn the written form of
the language.

In order to communicate or function in the so-called language of music, one must be able
to think musically. The ideal developmental scenario for the ability to think musically occurs as
follows: A child is provided with a rich musical environment in which acculturation through
listening is followed by randomly responding to music. Random responses develop into more
purposeful babbling of tonal and rhythmic sounds. This babbling becomes increasingly accurate
until the child is able to sing in tune and keep a steady beat – these are the fundamentals of
musical fluency. Once the child has an aural understanding of tonality and rhythm, notation can
be introduced. Thus, the notation becomes a symbolic representation of what the child already
understands aurally.

Clearly, this ideal set of circumstances does not occur in the musical development of
most people. This problem is compounded by the fact that when music is introduced in schools,
notation is often introduced before musical fluency, or audiational skill, is established. To
further the comparison, this would be akin to teaching children to spell their names before they
can say them. So, children’s early experiences with music often become a process of decoding
notes into letter names and rhythmic values into “tees” and “tahs.” The great problem here is
that content is being introduced without context being established.
Content in language is letters and words. When strung together into a sentence, they create context, or meaning. In music, content is individual patterns – tonal, rhythmic, melodic, or harmonic. Meaning is brought to the patterns when strung together into a phrase – that is musical context. The essential elements of musical context are tonality and meter. In order for musical content to have meaning, it must be understood within the context of tonality and meter. Therefore, content must be taught in coordination with the audiation of tonality and meter, not in isolation from it. Gordon summarizes the issue of content and context when he states, “without the necessary readiness of the audiation of context, the teaching of content precludes the possibility of desirable musicianship, forcing students to assume the role of rigid dutiful robots.”

It is crucial to the future of musical culture that each area of music education finds a way to resolve the lack of musical fluency that is the result of inadequate earlier training. For voice teachers, this means that we must acquire a set of skills for dealing with students who come to us at the high school or collegiate level with fine voices but little music literacy and questionable audiation skills. Furthermore, the possession of these skills will enhance our ability to teach higher-level musical skills as well. All singers have the capacity to audiate, and this skill can be developed at any level.

**Terms related to audiation**

The terms inner hearing, aural imagery, auralizing, and pitch internalization are all similar to audiation. These terms are found frequently in the broader literature of the psychology and cognitive processes of music and aural processing. The key difference between these terms and audiation is in context. Gordon states that audiation must include comprehension of musical context, not simple imitation of single pitch or intervals outside of a tonal context. Audiation is the most music-specific term available, and as this chapter describes, involves a great deal more than simple short-term retention of pitch.

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Types of Audiation

In his Music Learning Theory, Gordon discusses the varying types and stages of audiation. The types of audiation are non-sequential and are outlined in Table 2. Some of these types of audiation are more directly related to the process of singing than others, although all of them have implications for musicianship.

Table 2

| Type 1: Listening to familiar or unfamiliar music |
| Type 2: Reading familiar or unfamiliar music |
| Type 3: Writing familiar or unfamiliar music from dictation |
| Type 4: Recalling and performing familiar music from memory |
| Type 5: Recalling and writing familiar music from memory |
| Type 6: Creating and improvising unfamiliar music while performing or in silence |
| Type 7: Creating and improvising unfamiliar music while writing |

Listening to familiar and unfamiliar music

This is the most common type of audiation. It may seem that listening to music would simply be labeled aural perception. However, aural perception refers to the recognition of a tune or even simply noticing the sound. Type 1 audiation involves comprehending the music that is being heard by organizing the content as we hear it into sequences, recalling familiar patterns, and anticipating unfamiliar patterns. An example of audiation in listening is the momentary thrill experienced when a cadence does not resolve as expected. A listener that is not audiating would certainly not have this type of reaction.

In the study of singing, this type of audiation is very important to develop. On a basic level, a singer must be able to audiate context while listening. Is that passage in major or minor? What is the meter of the exercise my teacher just demonstrated? The type of listening being addressed here is not passive listening of the sort the student may do while doing homework with music playing in the background. This is active listening that occurs not only while listening to a

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18 Ibid, 11.
recording, but during the act of making music. Listening to the piano introduction of an art song before the voice enters requires concentrated audiation to establish context. If the singer must be given the starting pitch and hum it through the entire introduction to enter on the correct pitch, the singer is not audiating the tonal context, but is simply using muscle memory to retain the pitch.

**Reading familiar or unfamiliar music**

This type of audiation takes place as we read notation and is therefore called notational audiation. This includes silent score reading, performing what is being read, conducting from a score, or following a score while listening to music. True music reading is the ability to audiate from the notation what is to be performed before the sound is physically heard. Most musicians are taught only to decode the notation through an instrument such as the keyboard. So, music reading becomes a three-stage process of seeing the pitch on the page, translating that to a pitch name that tells us which key to press, and then hearing the pitch that results. Ideally, with experience and training, musicians develop the true ability to read music at sight.

Singers and voice teachers most often rely on the keyboard to provide tonal context. The keyboard is an excellent tool for learning to audiate tonality, but should not be used as a crutch or a quick fix to get beyond a singer’s difficulties with notational audiation. Simply playing the vocal line for a singer or playing it while the student sings will not improve notational audiation, this will only serve to reinforce the singer’s habit of imitating in lieu of audiating. While it is true that there are a number of great singers who have sustained successful careers without developing reading skills, this fact should not be viewed by voice teachers or students as an excuse to avoid a path toward musical independence. It is possible to audiate complex music on a high level without ever learning to read notation because music is, in fact, an aural art form. However, notation is an extremely important tool for connecting the performer with the composer’s intentions. If a singer must rely on another musician, perhaps a coach or a voice teacher, to interpret the music from notation and facilitate correct audiation, then the singer is left out of one of the most important aspects of the creative performance process. Suggestions for developing the skill of notational audiation will be provided in Chapter Five of this treatise.
Writing familiar or unfamiliar music from dictation

Writing music is another form of notational audiation. A clear description of this type of audiation is as follows: “When we write from dictation, we audiate what we have already aurally perceived, then we represent what we have audiated with symbols in notation.” This type of audiation highlights the fact that as we aurally perceive the music we hear, we first audiate the essential pitches and durations, or the context, and fill in the nonessential pitches and durations to complete the phrase or pattern we are hearing. These essential pitches and durations are what cause us to audiate tonality and meter. For instance, if a phrase we are to write from dictation contains a scalar passage in D major, it is the pitches of the D major triad that are essential to audiating the passage in major tonality. Listeners who cannot discriminate the essential from nonessential pitches will have great difficulty audiating the correct tonal context of a phrase.

Singers generally experience writing from dictation only in an aural skills or music theory classroom. This skill is not one that will ordinarily have direct applications to the study of singing, but one that will improve overall notational audiation. Just as the reading and writing of words and sentences are related processes, when we learn to write music, we become better readers.

Recalling and performing familiar music from memory

Recalling and performing from memory includes performing vocally or on an instrument, conducting, or listening in silence. As we recall familiar music, essential patterns audiated create a sort of domino-effect in our memories. Each pattern we audiate guides us in recalling the next pattern, or group of patterns.

Singers are, of course, expected to perform from memory in the majority of situations. It may then be assumed that all singers are audiating when they perform from memory. To some extent, this is true. However, a few example scenarios will lead us to understand that it is possible to perform from memory with little or minimal audiation occurring.

The first example is the young singer who has been inadvertently trained to rely heavily on the piano. If that young singer is asked to perform a passage without support from the piano, it may be quickly discovered that the singer was not audiating the music when singing with accompaniment, but imitating on a very sophisticated level. This becomes apparent because,

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without the piano, the singer struggles to remain in a single tonality or in the correct key. The melody or rhythm may become less accurate as well. All of these are signs that the student is unable to audiate the music independently of the piano.

Another example is the choral singer who seems to function fairly well when asked to sing the part with the rest of the section or the whole choir, but when asked to sing alone, either a cappella, or with piano, is unable to sing the part accurately. This is another instance of so-called instant imitation. That singer is essentially imitating the other voices in the section, but doing so quickly enough that it is undetectable by the conductor until asked to sing in solo.\(^{20}\)

**Recalling and writing familiar music from memory**

When writing music from memory, the notation becomes a representation of what we are audiating. This differs from dictation in that the music is familiar and the sound is not immediately present, but in our memory. In the simplest form, this can be transcribing a vocal exercise that was taught aurally. The manner in which we recall and organize the music is the same as in performing from memory, with the difference lying primarily in the product being written notation rather than a performance.

**Creating and improvising**

Types Six, Seven, and Eight all involve creating and improvising unfamiliar music. The types are delineated in the same ways as notational audiation: performing, reading, and writing. This level of audiation requires great musical fluency. In order to improvise or create music spontaneously, one must have a very large and complex tonal and rhythmic vocabulary, and a strong ability to put this vocabulary to work in various tonal and rhythmic contexts.

From the perspective of a voice teacher that teaches primarily in the realm of Western classical music, an understanding of the creativity and improvisation types of audiation are certainly less immediately needed for teaching young singing musicians. The most obvious benefit to improvisational and compositional skill in classical singing is the ability to ornament and embellish. The skill of ornamenting in Baroque music is one that should initially be approached in an improvisatory manner. The more advanced the audiatational skill, the more

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innovative and complex the ornaments that a singer may create. Cadenzas in operatic and song literature of the Italian bel canto period are often notated but certainly allow for some creativity as well. The singer who is capable of creating and executing exciting and fresh embellishments of this sort becomes a unique commodity in the singing world.

**Stages of Audiation**

The stages of audiation, as outlined by Gordon in his Music Learning Theory, are sequential and occur in the actual moment of musical thought. These stages and the mental process that takes place during audiation can only be theorized at this point. Gordon summarizes the way the stages of audiation function in the following statement: “Logic and reason suggest that when learning conditions for a given type of audiation are ideal, all relevant stages are included in one form or another and interact in a complex circular sequence of mental activity.”

So, in examining the six stages more closely, it should be kept in mind that these stages occur so quickly in strong musical minds that they are not perceptible to observers, or even to the musicians themselves.

**Table 3**

<table>
<thead>
<tr>
<th>STAGES OF AUDIATION</th>
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<tbody>
<tr>
<td>Stage 1:</td>
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<td>Stage 2:</td>
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<tr>
<td>Stage 3:</td>
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<td>Stage 4:</td>
</tr>
<tr>
<td>Stage 5:</td>
</tr>
<tr>
<td>Stage 6:</td>
</tr>
</tbody>
</table>

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22 Ibid, 14.
**Momentary retention**

This is the first and most elementary stage of audiation. Upon hearing music, we retain short series of pitches and durations that have yet to be organized in our minds by audiation. Momentary retention, while not audiation in and of itself, is a necessary preparation for the stages of audiation that follow.

**Imitating and audiating tonal patterns and recognizing and identifying tonal centers and macrobeats**

The pitches and durations that have been retained in our minds are then imitated silently. Imitation is essentially the repetition of music without giving it meaning. As we imitate what is heard, we begin to recognize and identify tonal centers and macrobeats (the primary pulse of the music). The pitches and durations are then organized into essential pitches and durations and their essential tonal patterns and rhythmic patterns.

**Establishing objective or subjective tonality and meter**

As the essential pitches and durations are organized into patterns, the individual’s musical experience and understanding determines how the patterns are identified as content. If the patterns audiated are recognized as major/duple, then objective tonality and meter have been established. If the patterns have more than one possible musical context, such as minor versus dorian mode, then the individual determines subjective tonality based on that individual’s previous musical vocabulary. If the information given by the pattern is insufficient for indicating tonality or meter, the individual will either make a judgement or be unable to audiate the pattern correctly. For instance, the tonal pattern do la do, which contains the interval of a minor 3rd, can be audiated as part of a minor triad (la do mi), or as part of a major triad (fa la do). Tonality cannot be determined by a two-note pattern, so the individual will subjectively (and subconsciously) decide how to audiate that pattern.

**Retaining in audition tonal patterns and rhythmic patterns that have been organized**

At this stage, the pitches, durations, and patterns that have been organized in audiation in the first three stages are retained. Gordon explains: “Thus, we are engaging in the first four stages of audiation in a cyclical process as the stages are interacting with one another, continuing to assess and restructure the essentials that we have organized earlier and are retaining in
audiation, and continuing to clarify and make better decisions about the tonality and meter we have already recognized or identified.”

Recalling tonal patterns and rhythmic patterns organized and audiated in other pieces of music

In this stage, we bring more meaning and understanding to the music being audiated by subconsciously comparing it to other music we have heard. The deeper the individual’s understanding of music, and the more extensive his or her musical vocabulary, the greater the meaning that will be brought to the music being audiated.

Anticipating and predicting tonal patterns and rhythmic patterns

In familiar music, stage six involves the anticipation of essential tonal and rhythmic patterns that we expect to hear in the musical future. In unfamiliar music, stage six involves predicting what is to come based on knowledge gained from experience with familiar music. “The more accurately we anticipate and predict, the better we will understand the music we are hearing.”

This explains why individuals with a limited musical vocabulary have difficulty understanding complex music. For instance, if an individual has experienced primarily major tonality and duple meter, which is often the case in popular music listeners, this individual will be unable to comprehend a piece with shifting tonalities and complex meters and will likely hear it as noise rather than music.

Each individual’s ability to process music through the six stages of audiation outlined above varies tremendously. This variation brings us back to the notion of the musical ear. Those with strong musical ears, or strong audiational skills, can process music on a more complex level than those with weak ears, or weak audiational skills. So, why do some of us have better audiational skills than others? Can we have an impact as voice teachers on how well our students audiate? These questions will be addressed in the following chapter on the nature and measurement of music aptitude.

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24 Ibid, 19.
CHAPTER 4

APTITUDE, ACHIEVEMENT AND TESTING

It is essential for voice teachers to have as much information about their students’ musical abilities as possible in order to provide each student with the type of instruction most needed. Most voice teachers will engage a new student in an informal interview to find out such factors as previous vocal study, choral ensemble experience, instrumental music training, and so on. Then, vocal production and musical abilities are assessed by listening to the student perform vocal exercises or a piece of music. While this process certainly provides the teacher with a great deal of information on which to base instruction, the matters of musical potential and current audiation skills are likely undiscovered or possibly misinterpreted. This chapter is devoted to discussing music aptitude and achievement and objective tools that teachers may use to measure both.

Music aptitude is the potential to learn music. Music achievement is the measure of what one has already learned. Gordon explains, “Music aptitude is a hunger, whereas music achievement is the satisfaction of that hunger.”25 While it is easily imaginable for a student who is a high achiever in music to also have high aptitude, it is also possible for someone who demonstrates low music achievement to have high music aptitude due to inadequate formal training. It is not possible for a student to have low music aptitude and high achievement.

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Development of Music Aptitude

All people are born with some level of music aptitude. This initial level of aptitude is innate, just as other areas of intelligence are innate and variable in each person. As we develop, our environment stimulates brain connections that are made to become responsible for various senses and intelligences. Gordon explains this in the following manner:

The cortex consists of neurons that are interconnected by axons and dendrites, which are stimulated by syntactic activity. Nature provides the child with an overabundance of cells to make these connections, both before birth and at critical times after birth. Unless the cells are used for that purpose during these critical times, they may be lost and never recaptured. Thus, if a very young child has no opportunity to develop a music-listening vocabulary, the cells that would have been used to establish that hearing sense will be directed to another sense, perhaps the visual, and so the visual sense will be strengthened at the expense of the aural sense.26

Thus, the innate level of music aptitude is impacted either positively or negatively by a young child’s environment. In a child born with a high aptitude but lacking a rich musical environment, some atrophy of aptitude will occur, while a child born with low or moderate aptitude may experience an increased aptitude level when exposed to a strong musical environment. It is also known that the above-mentioned brain connections become stabilized, or hard-wired, at approximately age nine or ten.27 Clearly, this does not mean that learning ceases, but it does mean that the aptitude level stabilizes and is no longer affected by environment.28 So, unfortunately, those who teach voice cannot have an impact on student’s music aptitude levels since they do not generally begin work with students until the adolescent years. This does not mean that teachers cannot facilitate student’s improvement as musicians. The voice teacher’s task is to help them reach their musical potential, or aptitude level.

Music aptitude is not a one-dimensional intelligence. In fact, more than 20 different music aptitudes have been discovered.29 Of these, seven are considered measurable. The two

26 Ibid, 9.
28 Ibid, 10.
29 Ibid, 11.
measurable music aptitudes that are fundamental to individual musical development are tonal aptitude and rhythmic aptitude. Tonal and rhythmic aptitudes are independent of one another. For example, an individual may have very high tonal aptitude and only average rhythmic aptitude, or low average rhythmic aptitude and high tonal aptitude. It is also important to note that the music aptitudes are not related to other areas of intelligence. So, while many students who are high academic achievers also may have high music aptitude, there are also students who do not achieve well academically who have high music aptitude.

Knowing students’ stabilized tonal aptitude and rhythmic aptitude allows the teacher to create a profile of each student. An aptitude profile informs the teacher’s selection of exercises and repertoire, as well as career guidance for the student. In order to measure a student’s aptitude, two different valid and normalized tests are available: Music Aptitude Profile, and Advanced Measures of Music Audiation.

**Measuring Music Aptitude**

The measurement of music aptitude or potential for a student of any level requires that the testing tool not be based on principles of music achievement. In other words, to assess a student’s potential to learn music, one cannot assume that formal music learning has taken place. Therefore, no notation, musical terms, or theoretical knowledge can be required of a student while measuring aptitude. If these were required, the test would be measuring music achievement, not music aptitude. Both of the following testing tools are valid music aptitude tests.

The Music Aptitude Profile (MAP) is a measure of stabilized music aptitude that has three sections: Tonal Imagery, Rhythmic Imagery and Musical Sensitivity. This test has been validated through extensive pre-publication and post-publication investigations and norms have been established for students ranging from grades seven through twelve. It has been used in practice for college students, but no validity data or norms have been established for this age group. Each section of the test takes fifty minutes to administer, so teachers must plan for three hours of total testing time. It is recommended that the three test sections be taken on three different days. The test yields a tonal aptitude score, rhythmic aptitude score, and musical
sensitivity score. While this test provides the fullest picture of a student’s musical potential, its length and lack of validation data at the college level limit its usefulness for many voice teachers.

The *Advanced Measures of Music Aptitude* (AMMA) is also a measure of stabilized music aptitude, but it is intended for high school and college aged students. Validation data and norms are available for high school, college non-music majors, and college music majors. It contains thirty questions that combine tonal and rhythmic audiation skills. The entire test takes only twenty minutes to administer and it yields tonal, rhythmic, and composite scores. Due to the above factors, the AMMA is recommended for use in testing music aptitude for high school and college level voice students. It should be noted that aptitude tests are also available for younger students. The Primary Measures of Music Aptitude (PMMA) and Intermediate Measures of Music Aptitude (IMMA) may be used for younger students.

The questions require the student to listen to two musical examples and to decide whether the two examples are the same or different. If the examples are different, the student must answer whether they differed in tonal content or rhythmic content. On the answer sheet, students are instructed to mark S (same), T (different tonally), or R (different rhythmically). The rationale for the test is based on a carefully written set of basic principles. Those principles, which will assist the reader in further understanding the nature of this test, are excerpted below from the *Manual for the Advanced Measures of Music Audiation*.30

1. The audiation of music, not imitation, memorization, or the discrimination of musically isolated pitches or durations, should be the integral element of the test.
2. Students should not need to be able to read or write music in order to take the test.
3. Students should not need to be able to perform vocally or instrumentally to take the test.
4. Students should not need to be familiar with the theory of music or the history of music in order to take the test.
5. All music in the tests should be specially composed for the specific purpose of the test. The use of original music prevents giving some students an advantage as a result of their familiarity with existing music.
6. All music in the test should be performed by a professional musician.
7. Students should enjoy taking the test. The test should provide students with educational listening experiences. A variety of tonalities, keyalities, meters, and tempos should be included in the test.
8. The test should be suitable for assessing a wide variety of music aptitudes.

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9. Test questions should not be arranged from “easy” to “difficult.” Rather, item difficulty should vary throughout the test to stimulate and maintain student interest.

10. The types of responses needed to answer the test questions should not be so complex as to require abilities extraneous to music aptitude.

In order to provide the clearest understanding of how the test works, the author of this treatise has provided two sample questions. These are not actual questions from the AMMA itself, but merely samples created by the author to emulate the test. In Example 1, the student hears the first musical phrase, followed by four seconds of silence, then the second musical phrase. The correct response would be “Rhythm,” meaning that the two phrases were different rhythmically and the same tonally. In Example 2, the student hears the two phrases in the same manner. The correct response would be “Tonal,” because the two phrases were different tonally and the same rhythmically. These samples are quite simple and rather obvious in order to illustrate the basic concept. Many of the questions on the actual test are very challenging and the differences much more subtle.

Example 1:

Example 2:

Figure 2, Notated examples of AMMA question
Each test will yield a tonal score, rhythmic score and composite score. These scores can then be used to derive a percentile rank based on the norm scores for the appropriate category. These percentile rankings can be used to determine if a student has high, high average, average, low average or low aptitude. These categories are broken down as shown in Table 4.31

<table>
<thead>
<tr>
<th>Aptitude</th>
<th>Percentile Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>80-99%</td>
</tr>
<tr>
<td>High Average</td>
<td>60-79%</td>
</tr>
<tr>
<td>Average</td>
<td>41-59%</td>
</tr>
<tr>
<td>Low Average</td>
<td>21-39%</td>
</tr>
<tr>
<td>Low</td>
<td>1-20%</td>
</tr>
</tbody>
</table>

Table 4
Aptitude Levels Based on AMMA Percentile Rank

It is not unusual for a student to have high tonal aptitude and average rhythmic aptitude or vice versa. Tonal and rhythmic aptitudes are separate but often correlated.

The teacher’s manner of interpreting the test results is essential to proper implementation of the testing procedure. Gordon states that the AMMA is “a test designed to act as an objective aid to the teacher in assisting each student to make the best use of his or her music aptitudes through appropriate music instruction and opportunities.”32 Aptitude scores should never be used to deprive a student of music instruction or to prevent a student from participating in music activities. The manual for the AMMA provides the following purposes for the test for use in interpreting the results:33

1. To serve as a part of the criteria for entrance to a college or university department or school of music.
2. To identify college and university students, non-music as well as music majors, who possess the music aptitude to achieve high standards in music.
3. To establish objective and realistic expectations for the music achievement of college and university music and non-music majors.
4. To efficiently and diagnostically adapt music teaching in private instruction and within a classroom and ensemble to the individual musical differences found among students.

32 Ibid, 36.
33 Gordon, Advanced Measures of Music Audiation, 33-35.
5. To assign college and university students to specific music classes, ensemble, and types of private instruction that are designed to meet their individual musical needs.

6. To assist college and university music students with objectivity in making career decisions.

7. To efficiently and diagnostically adapt music teaching within a classroom and ensemble and in private instruction to the individual musical differences found among high school students.

The purposes outlined above show that interpretation of test results could have a significant effect on an entire university music curriculum if implemented properly. However, since the scope of this treatise is limited to the voice studio, the author will discuss possible scenarios where interpretation of test results could impact the voice teacher and student. The most important information a voice teacher gets from the AMMA is an objective idea of each student’s potential musical capabilities. Clearly, tonal and rhythmic aptitudes do not represent the whole picture of a student’s musical potential, but they are the foundational elements and can be measured objectively. The following scenario will hopefully assist in clarifying the value of aptitude testing.

Imagine beginning a new school year with a first year student who performed extremely well in the audition for entrance to the studio or institution. The student possesses a fine instrument and exhibits a maturity of presentation that is rare in young singers just beginning vocal study. The student’s teacher, seeing this seemingly boundless vocal potential, assigns repertoire that is musically quite difficult in order to challenge this fine talent. After several weeks of study, it is apparent that the student is struggling to grasp the assigned literature and is beginning to become frustrated. The teacher may be confused as to why the student is struggling due to the perceived high talent level and may begin to question the student’s work ethic or commitment to vocal study. The subjective assessments made by the teacher based on the audition are now in conflict with the student’s true ability levels.

If an aptitude test had been given, the teacher likely would have noted that despite a fine instrument, this student has only average tonal aptitude and low average rhythmic aptitude. Though the student was clearly achieving at a relatively high level at the audition, this measure alone did not provide the teacher with all the information necessary to establish an appropriate course of study. Of course, knowing the aptitude levels of the student should not discourage the teacher from accepting the student, as the innate vocal gifts give the student other advantages.
Having the objective aptitude measurement would have provided the teacher insight into the musical mind behind the voice and allowed a more appropriate course of study to be offered to the student. This scenario could work in the reverse as well. A student who performs poorly at an audition may possess extremely high aptitude but require proper instruction in order to achieve closer to potential. The aptitude scores are a key component, but not a complete view, of a student’s overall musical profile. Another objective component that may be measured is a student’s music achievement, or current ability to audiate.

**Measuring Music Achievement**

A music achievement test serves the need for assessing whether a student’s performance reflects his or her capabilities as established by the music aptitude score. The areas of music achievement to be measured, therefore, must be comparable to those measured in the aptitude test. A music achievement test may measure knowledge of music theory, knowledge of music history, music-reading skills and music performance skills. The measure of most interest here is the student’s ability to audiate. So, a test that measures tonal and rhythmic audiation, as well as notational audiation (reading and writing notation), is necessary. The *Iowa Tests of Music Literacy* (ITML) is a multi-level battery of tests designed by Gordon to measure these dimensions of music achievement.

The ITML has six levels of tests that are designed with increasingly difficult content areas. Within each level, there are six subtests classified into two divisions: Tonal Concepts and Rhythmic Concepts. Each division contains the subtests Audiation/Listening, Audiation/Reading, and Audiation/Writing. In the Audiation/Listening subtests, students hear tonal or rhythmic patterns and are asked to indicate whether the tonality is major or minor or the meter is duple or triple. The Audiation/Reading subtests require that a student indicate whether the tonal or rhythmic patterns that are seen in notation are the same as the ones heard on the recording. In the Audiation/Writing subtests, the student sees incomplete notation for tonal or rhythmic patterns heard on the recording and must complete the notation by filling in note heads, flags, beams, ties, and rests. Each level of six levels of the test follows this structure. The level of difficulty is increased at each level by adding more tonal and rhythmic concepts. For instance,

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Level One tonal concepts include major and harmonic minor tonalities and notation is only in treble clef with no sharps or flats in the key signature, whereas Level Four tonal concepts include the above plus multitonal (atonal) and notation is in treble clef with up to three sharps or three flats in the key signature. The multiple levels are designed to be given over time to track student progress.

The ITML will yield a score for each subtest of each level as well as a composite score for each level. Norms are available in the test manual for comparison for grades 4-12 for Levels 1, 2, and 3, and for grades 7-12 for Levels 4, 5, and 6. With this information, the teacher can assess student abilities in each of the six areas, providing a broad view of the student’s fundamental music literacy.

**Comparing Scores**

Given scores from both the AMMA music aptitude test and the ITML music achievement test, the teacher can make some conclusions about each individual student’s needs. When comparing the aptitude scores to the achievement scores, the teacher should look for inconsistencies between potential and achievement. For instance, if a student shows a high tonal aptitude but does not score well on the tonal imagery portions of the achievement test, it is clear that this student is achieving below potential. Likewise, if a student shows average aptitude in both tonal and rhythmic but scores well in both of these areas on the achievement test, then this student is achieving at potential.

These assessments are most useful if a course of action is taken by the teacher to adapt instruction to meet each student’s individual needs. If the student is achieving at potential as in the case above, it can be assumed that the current course of study is meeting the student’s needs. However, in the case of the student achieving below potential, the instruction should be adjusted to focus on improvement of skills in the area where achievement is far below potential. Suggestions for adapting instruction based on knowledge of aptitude and current achievement will be discussed further in Chapter Five.
CHAPTER 5

PRACTICAL APPLICATIONS OF AUDIATION IN THE VOICE STUDIO

The knowledge of the function of audiation and aptitude can offer voice teachers a new awareness of students’ singing. Given knowledge of audiation, the teacher can implement a variety of exercises and techniques to improve audiational skill and potentially improve a student’s singing. This chapter will outline suggestions as to how one can implement the knowledge of audiation into the voice studio. These techniques fall into three categories: 1) exercises to improve fundamental audiational skill and music literacy, 2) techniques to be used in vocalise, 3) techniques to be used in repertoire study.

Improving Fundamental Audiation and Music Literacy

In the ideal musical world, voice teachers would not need to address the improvement of audiation skills and music literacy in the voice studio. Students would arrive at the studio with highly developed ears, excellent reading skills and strong theoretical understanding. However, the reality of the current climate in music education is one wherein many students enter high school or college with a good variety of musical experiences, but without strong musical fundamentals. These fundamentals include music reading, knowledge of repertoire, theoretical understandings and, of course, the ability to audiate.

The methodology that Gordon’s writings prescribe for developing audiation is the combination of Learning Sequence Activities (LSA) with coordinated classroom activities. In the classroom or ensemble setting, this means 7-10 minutes of LSA at the start of each class period or rehearsal and including other activities that reinforce the skills learned during LSA. A direct adaptation into the voice studio would involve using the first five to ten minutes of the voice lesson for one-to-one pattern instruction, then reinforcing the basic tonal and rhythmic
skills of the learning sequence with coordinated vocalise and repertoire study. The difficulties with such a direct application are many: large amounts of lesson time used for pattern instruction, complex record keeping, and too little time for music making and voice development. This author would submit a modified methodology that puts more impetus on the student, but which has the potential to provide excellent results.

**Self-Study Using Computer Software Aid**

A useful piece of software, titled *Audiation Assistant*, has been developed by Bruce Dalby, and is available for both PC and Macintosh platforms. The software is essentially a do-it-yourself version of Learning Sequence Activities. The program allows users to select the level of the sequence they wish to practice and provides recorded patterns for students to echo aloud. The full details of the software will be discussed below, but the possibility for application should be clear. Given access to this software, the teacher could assign a specific content area for the student to practice independently each week, then quickly assess the student’s progress by having the student demonstrate a few exercises during the lesson time. It is important to note that while the exercises begin quite simply, the level of difficulty can be set to challenge even the best professional musician. The inclusion of guided use of this software could provide an excellent sequential model for audiation development throughout the young singer’s training.

The following is an example of how a student might interact with the software program. The teacher assigns the student to practice major tonal patterns at the aural/oral level. At this level, the student will hear patterns in major tonality of tonic and dominant function which should be echoed aloud. The student may choose a comfortable key in which to sing, and choose between a male- and female-recorded voice. At the aural/oral level, students do not see notation or use solfege syllables. They are simply learning the patterns through repetition. This is much like learning words or phrases in the study of a foreign language. In order to put words into context, one must have a working vocabulary. The patterns function as a basic musical vocabulary. A high school or college student with a strong musical background and average to high music aptitude will likely find this level quite simple and be able to progress quickly through the aural/oral sequence. In order to provide more challenge at this level for a student with high aptitude, the harmonic functions of the patterns may be changed from simply tonic and dominant in major and minor to include a much greater variety of harmonic functions.
Once the student demonstrates mastery of the given patterns at the aural/oral level, the verbal association level of learning should follow. Here, the student will echo the patterns sung or chanted by the recorded voice using solfege syllables instead of a neutral syllable. It should be emphasized that the tonal solfege system used is moveable do with a la-based minor and that the rhythmic system used is the so-called rhythmic solfege outlined in Chapter 2. Again, this level is simply rote learning by imitation of recorded patterns. The student is developing a vocabulary in both tonal and rhythmic solfege.

In partial synthesis, the student will hear two series of patterns and must decide the tonal or rhythmic context. For example, the software plays Series One – four different minor patterns performed without tonal syllables, followed by Series Two – four different major patterns performed without tonal syllables, and the student must label each series. This level can be set to include major, minor, dorian, and mixolydian modes in tonal content, and duple, triple, combined meters, and unusual meters in rhythmic content. (See Figure 3) The teacher should
select the appropriate level of difficulty based on the student’s aptitude and current level of understanding of modes.

At the symbolic association level of the learning sequence, the software shows the notation for the patterns simultaneously with the recorded performance, and again the student simply echoes the patterns. Here, the student begins to associate musical symbols with the patterns that can already be audiated, reinforcing and expanding upon notational audiation skill.

At the generalization level, the software moves to a form of inference learning. The student hears the patterns sung without solfege and must sing the patterns back with the solfege syllables. The student can choose to work at this level with or without the notation being shown. After the student performs the pattern with solfege, accuracy can be checked by having the computer sing the pattern again with the correct solfege answer.

Once the student has progressed through this sequence, Audiation Assistant also offers a quiz mode to synthesize various aspects of the knowledge gained in the lower levels of the software. In the quiz mode, the student again chooses either tonal or rhythmic content and sets the level of difficulty. The computer then performs a pattern on a neutral syllable and shows the
student four notated patterns in multiple-choice format. This mode is illustrated in Figure 4. The student’s task is to choose the notated pattern that matches the pattern performed by the recorded voice.

Due to the multiple levels of difficulty, the sequence can be repeated when adding a new level of content. For example, a new student with average tonal aptitude and average rhythmic aptitude should begin the sequence with the following prescribed content and difficulty:

- Tonal Content: Major and Minor
- Harmonic Functions: Tonic, Dominant, Subdominant
- Rhythm Content: Duple and Triple
- Beat Functions: Macrobeat, Microbeat, Divisions

The student should follow the entire sequence with these settings unless the teacher and student deem the level of challenge inappropriate. Once complete, the level of difficulty should be raised and the student should repeat the sequence. Each time a new content area is to be introduced, the student should begin at the aural/oral level and proceed through the sequence.

So, if the student is being introduced to unusual meters for the first time or is unskilled at working in these meters, the teacher should ask the student to begin the sequence at the aural/oral level and proceed through the sequence focusing on unusual meters. The skill building provided by following the learning sequence would help students continue to grow to reach their fullest potential as musicians. This attention to fundamentals works to bring students whose audiation skills are below average to a more functional level and to bring those who already have strong skills to a much higher level.

**Reinforcing and assessing audiation development in the voice lesson**

The use of the *Audiation Assistant* software is a practical way for students to develop fundamental audiation skills while using a minimum of lesson time. However, it is important for the teacher to track student progress with the software by having the student perform the exercises in lessons. Additionally, the teacher can provide more challenge to the student by using some of the techniques Gordon prescribes for Learning Sequence Activities in a classroom setting.

The sequence of pattern instruction exercises for Learning Sequence Activities are published in *Jump Right In: Tonal and Rhythm Register Books*. These Register Books contain
the same sequence of patterns that is used in the *Audiation Assistant* software, but the techniques used have more variety than simple rote imitation. The various techniques used in the Register Books include:

1. Teacher sings the pattern and the student sings only the resting tone (tonic).
2. Teacher sings the pattern and the student sings only the last note of the pattern.
3. Teacher sings the pattern and the student identifies it as tonic or dominant.
4. Teacher chants the pattern and the student identifies it as duple or triple meter.

Use of these variations during the lesson time will further challenge and develop the student’s audiation skills and allow the teacher to assess the student’s progress through the sequence.

**Vocalise**

The primary purpose for vocalise work in the voice lesson is to develop the various aspects of vocal technique such as breath management and coordination, phonation and onset, resonance and articulation, and issues of registration. Additionally, vocal exercises provide an opportunity to develop and reinforce audiation skills.

**Use of the piano**

During vocalise work, the piano should be used only to provide tonality, play example exercises, and possibly provide harmonic support. The teacher should not play pitches for the student while the student sings. The simple reason for this is the matter of independence. If a student learns to rely on the piano for pitch security, that student is not challenged to develop musical independence. The imitation of pitch that a singer experiences while the teacher is playing the pitch as the student sings is not audiation, in fact it can interfere with audiation, causing the student to remain in a state of constant momentary retention of pitch. In order to engage audiation, the teacher should play and or sing the desired exercise and ask the student to imitate. While imitation in itself is not audiation, it is preparing the musical mind for the process of audiation by beginning Stage 1 of audiation, momentary retention. Put simply, playing pitches with singers only allows them to think in the musical present. Audiation requires anticipation of what music is to come.
Because students are often accustomed to depending on the piano or on other members of a choir, they may at first be hesitant to sing without each pitch being played with them. Following a short adjustment period, students will gain confidence and begin to establish more independence. This is a necessary step toward developing audiation and musical independence. From the teacher’s perspective, it is important to allow students more independence and to challenge them in this way. It is also vital to the teacher’s ability to assess the full spectrum of a student’s sound that the ears be cleared of the sound of the piano.

Teaching a new exercise

When the teacher would like to begin a new exercise with a student, a concerted effort should be made to be sure the student can audiate the pattern of the exercise. If the exercise is musically simple, such as sliding up and down a fifth, it can be assumed that the student will not have difficulty comprehending the pattern. However, the more complex the exercise, the more likely it is that some students will need assistance in audiating the exercise. The best manner of demonstrating the recommended sequence for teaching a new vocalise is to give a specific example. Figure 5 is an exercise from Mathilda Marchesi’s Op. 31 vocalise book.

![Figure 5, Marchesi Exercise.](image)

While not extremely complex, the exercise does involve a series of sequential patterns. Note that the focus of this process is to allow the student to audiate the pattern correctly prior to vocalization so that compensatory muscular habits are not learned while trying to negotiate the pitch patterns.

Step 1: Demonstrate

Demonstration by the teacher should present the ideal performance of the exercise both musically and vocally. This allows the singer to hear instinctively both the musical content and the manner of execution. If desired, the piano may be used to reinforce the musical content after the vocal demonstration.
Step 2: Ask the student to audiate the exercise in silence

Play the tonality for the student. Ask the student to imagine executing the pattern correctly. Then, ask the student to assess whether the pattern is clear in his or her audiation. If not, ask where the content is unclear and reinforce that portion with vocal demonstration or on the piano.

Step 3: Identify essential and non-essential pitches

Before asking the student to vocalize the entire exercise, break it into patterns. For this specific exercise, the essential pitches are those of the major arpeggio. The descending scalar portion consists of many non-essential passing tones arriving at parts of the triad on strong beats.

![Figure 6, Essential pitches of Marchesi Exercise.](image)

In order for the student to audiate the pattern successfully as a whole, it will be helpful to identify and perform the essential pitches first. Ask the student to audiate silently the essential pitches only. Then, ask the student to vocalize the essential pitches. Once successful, the student should sing the essential pitches only while the teacher sings or plays the entire exercise.

Step 4: Student performs full exercise

Having followed the above procedure, the student should have a firm mental grasp of the exercise and is now ready to perform it and focus on vocal production. Of course, audiating the exercise correctly does not guarantee a perfect vocal performance of the exercise. Matters of breath coordination, vowel production, articulation and registration will still play a role in mastering the exercise. However, the student will have the correct musical information in his or her imagination, and from there be allowed to engage the instrument to produce the correct sounds. When the process of teaching a student to audiate the exercise is not followed, a period of trial and error ensues which can potentially cause the student to learn poor habits of controlling the sound with muscle tension.
Repertoire

Song Study and Preparation

Every singer must develop his or her own method for learning new repertoire. Conscientious voice teachers have a prescribed system that they teach in order to facilitate learning repertoire. This process usually involves researching the background of the piece, attending to the text, then negotiating the vocal line, harmonic structure, and coordinating with the accompaniment. The process of learning a new song can be used as a tool for developing audiation.

The process outlined here is similar to those recommended by many voice teachers and coaches but also offers a new perspective on learning the musical content of the piece. Singers should research the composer background, cultural context, poet and text as the first step in this process. Once ready to begin the musical learning stage, the following steps are recommended:
1) isolate rhythmic content, 2) isolate melodic content 3) combine rhythmic and melodic content, 4) combine text and rhythmic content, 5) combine all elements.

The reason for separating elements comes from Gordon’s research on aptitude. It has been shown that each person has a separate tonal and rhythmic aptitude. Some musicians have a higher rhythmic aptitude while some are higher in the tonal realm. Ideally, both areas are strong, but regardless, they should be dealt with separately when initially learning a piece. When each area is learned correctly in isolation, the likelihood of learning errors is minimized. For instance, if one is attempting to learn pitch, rhythm and text all at once, a simple rhythmic error will become more problematic because it is then embedded into the text and pitch content. This makes unlearning the error more difficult than if the rhythmic problem was identified and corrected in isolation.

Isolating rhythmic content. The first step in learning the rhythmic content of a song is to establish the rhythmic context. The context includes meter, time signature, and dominant pulse. While a student will be familiar with identifying meter and time signature, identifying the dominant pulse or rhythmic feel of the piece may be more difficult. Guidance from the teacher based on knowledge of the piece is important because the time signature and manner of notation will not necessarily reveal to a singer how to feel the pulse. For example, 3/4 time is sometimes
felt in one and sometimes felt in three. The manner of notation is not so important as the student’s ability to feel the pulse correctly.

Once the context has been established, the student should read through each section of the piece chanting the rhythm on a syllable such as [di] or [da]. Note values should be sustained on the vowel to the full value, just as if singing on pitch. This is necessary so the singer begins to engage a sense of line, even at this elementary stage of learning the piece. The singer should engage the body and mind as if performing while working through the musical rudiments.

Use of a metronome. A metronome is an invaluable tool for use during this phase of learning a song. It, of course, will provide a steady pulse for the singer while chanting the vocal line. It will also help eliminate the habit many young singers have of cheating the tempo when running into difficulty. The tendency to rush ahead during simple passages and slow down or skip beats during difficult passages may cause poor rhythmic habits to develop. Also, working with an inconsistent tempo inhibits the musician’s ability to develop steady, independent time. Using the metronome consistently during the chanting phase helps avoid the development of poor rhythmic habits.

Students should be instructed to avoid keeping the beat by tapping a foot or pulsing the body. This behavior is usually a sign that the student is not audiating the pulse clearly. It will also lead to poor postural habits and a tendency to pulse the beat during performance. Ideally, rhythmic pulse should be internalized and not shown physically while singing. However, movement will be necessary for some students to audiate the pulse correctly. More useful movements that may be used in this case are fluid arm movements or conducting. These types of movement allow the singer to feel rhythm in the continuums of space and weight, rather than simply in time. Gordon explains the connection of movement to rhythm in the following passage:

Musical time (tempo) must exist within the realm of space, but space can be experienced apart from musical time. Students should physically experience space before they are introduced to the concept of musical time, as in tapping feet and clapping hands. There is good reason for this. Consider a very slow tempo. How is it known when the next beat occurs? By counting? Certainly not. When the next beat is to occur is felt actively or imaginatively (in audiation) in the body. For that to take place, students must have first explored space with their arms, legs, hands, and feet in stationary and locomotive positions.35

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The type of movement the student needs in order to maintain steady tempo will vary depending on the student’s rhythmic aptitude and level of physical coordination. The most elementary level of coordination, as stated above, should not be tapping the beat, but moving fluidly to feel space in relation to time. Keeping the pulse by tapping the heels while standing introduces the concept of weight, which is also crucial to audiating rhythm. Combining fluid movement with weighted movement in time is the most complex level. Conducting is an example of this type of movement.

**Isolating tonal content.** Similar to rhythmic isolation, the first step in working through the tonal content of a piece is to identify tonal context. Tonality and key signature are the important elements of tonal context. Once identified, tonality must be established by first playing the tonic chord on the piano. Playing tonic/dominant/tonic is the most effective way to establish tonality. If using only the voice and a pitch pipe or other pitch reference, simply singing *so la so fa mi re ti do* will serve to establish tonality.

When isolating tonal content in learning a new piece, it is important to allow true isolation to occur. This means that only pitch content should be addressed, without following the rhythmic structure and inflection of the piece. This is a difficult task for most musicians because rhythm is considered by most to be the most fundamental musical element. However, it is essential that tonal content be isolated from rhythmic context so that any potential errors in either content area do not negatively affect the other.

Before attempting to read the tonal content in large sections or phrases, it is helpful to group the melody into smaller tonal patterns. Use of solfege is highly recommended and use of the piano should be as limited as possible. Schumann’s *Widmung* is shown in Figure 7 in its original notated form and also grouped into small tonal patterns. It is important to note that tonal patterns are not grouped according to the rhythmic content of the piece, but by how they fit into the tonality and relate to one another tonally. The grouping of patterns is subjective. Notice here that the patterns overlap and consist of both triadic and scalar patterns. The singer should approach each of these patterns individually to achieve mastery out of context before joining them together to bring out the full vocal line.
Gordon has shown through his research that when performing tonal patterns, it is best to leave space between each tone in order for the singer to have time to audiate the next pitch or pitches. For this reason, the singer should sing each pitch briefly, not sustained. This staccato approach ensures that the pitch being audiated is the one that is sung. There is no time for adjusting the pitch once phonation has begun and no time to slide into or out of pitches. This step will most certainly feel the most tedious to the student upon first experiencing it. The urge to play the part on the piano will be strong but will not help the student grow musically and aid in establishing musical independence.

**Combining tonal and rhythmic elements.** Once the two content areas have been mastered in isolation, the singer should begin performing the vocal line in segments combining the tonal and rhythmic content. When first combining the two elements, it is recommended that the use of the staccato approach outlined above be continued on a syllable such as [di]. This ensures that the student is audiating and performing pitches and rhythms accurately and is not relying on muscle memory to feel the pitch changes. Incidentally, it is not recommended that solfege syllables be used once the elements are combined. Because Music Learning Theory includes a solfege system for both tonal and rhythmic elements, each is intended for use only when isolating content areas. Use of tonal solfege while the rhythmic element is present, or vice versa, confuses the fundamental intent of the tool. As soon as the singer can successfully perform the piece in this manner, the piece should be practiced sustaining notes to their full rhythmic values while still focusing on tonal and rhythmic content.

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36 Ibid, 51.
Once the student is familiar with the process outlined above, this type of preparatory work should be done in the practice room. Once the tonal and rhythmic elements are successfully combined, the student should move on to complete the learning of the song according to the process outlined by the teacher to include the elements of text, dynamics, phrasing, style, and so on.

Within the lesson time, there are some additional techniques that the teacher can use to further challenge and develop a student’s audiation while working on repertoire. The use of silence is not one that is often emphasized in the voice lesson, but one that can be extremely effective in assessing and developing a student’s audiation skills. The following exercises include the use of silence, or silent audiation:

1. Ask the student to sing only the first and last notes of a phrase and to audiate the other notes in silence.
2. Ask the student to alternate beats singing and audiating silently.
3. Ask the student to sing for one measure and silently audiate for one measure, then sing a duet with the student where the teacher sings aloud the measures the student was audiating. Switch parts.

These exercises challenge the student to begin listening quite differently than when singing aloud all of the time. The musical imagination is awakened and challenged to become more active. Thus, when the teacher asks the student to “hear the phrase before you sing it,” the teacher and student can have confidence that this is an attainable request. The techniques and exercises discussed in this chapter are but a few examples of how the concept of audiation can be applied to the voice studio. As voice teachers further their understanding of Music Learning Theory, music aptitude, and audiation, more applications will likely be discoverable.
BIBLIOGRAPHY


A native of Williamston, Michigan, Christopher Mitchell received the Bachelor of Music in vocal music education from Michigan State University. Both the Master of Music in vocal performance and Doctor of Music in vocal performance with a pedagogy emphasis were completed at Florida State University.

Mr. Mitchell performs regularly in recital and concert venues and has worked extensively in opera and musical theater. As a recitalist, Mr. Mitchell specializes in German Lieder and British and American art songs. His repertoire includes Schubert’s Winterreise as well as songs and cycles by lesser-known composers such as Hans Pfitzner, Franz Schreker and Othmar Schoeck. Other favorite repertoire includes works by British composers John Ireland and Ralph Vaughan Williams as well as Americans Ned Rorem, William Bolcom and Richard Cumming.

In opera, Mr. Mitchell’s roles have included Nick Shadow in The Rake’s Progress, Leporello in Don Giovanni, Guglielmo in Così fan tutte and the title role in Don Pasquale. Recent concert appearances have included performances with both the South Dakota Symphony and the Sioux City Symphony. The summer of 2006 brought Mr. Mitchell to Northern Italy where he performed Jacques Ibert’s Quatre chansons de Don Quichotte and Barber’s Dover Beach at the Casalmaggiore International Music Festival.

Mr. Mitchell served on the music faculty at the University of South Dakota for five years prior to his recent appointment as Assistant Professor of Voice at Murray State University in Murray, KY. An active NATS member, Mr. Mitchell was selected to participate in the NATS Foundation Summer Intern Program in Fort Collins, Colorado in 2004 and has served as South Dakota District Governor and President of the Lewis and Clark NATS Chapter.