Ear Training: A Critical and Practical Approach

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The development of aural skills is a very important area of study for any musician. In his book *Modus Novus*, Lars Edlund says: “The main object of aural training should be to develop musical sensitivity. The different exercises - sight-reading (sight-singing), dictation etc., should not be regarded as an end in themselves but as a means to attain this sensitivity.” In this study, I have evaluated four ear-training books, and four computer programs as they relate to my own study of ear-training. The first book to be discussed (Karpinski) is in many respects an evaluation in and of itself. It covers nearly every possible aspect of tonal ear-training while relating its studies to those of other books. Due to the exhaustive and high-quality discussion of tonal ear-training in this book, I have focused on the study of atonal ear-training in the other three books. In the following paragraphs, I will outline what my personal ear-training method has been before the evaluation of these sources followed by a new personal approach to ear-training incorporating what has been learned.

In my personal tutoring of ear-training, I have used the following exercises to guide the development of my students in interval identification, identification of chord quality, harmonic progressions, melodic dictation, rhythmic dictation, and sight-singing. In the past when tutoring interval identification, I have suggested that students use several different associations with the interval as they are hearing it. The student should listen first for distance from one pitch to the other, relative dissonance, and any type of melodic tendency of tone. Once these elements have been discussed, I ask the student to come up with his/her own verbal description or association with that interval. When a student is first learning to identify intervals, it is important to be able to use as many different elements as possible decide on an answer. I use the same approach in the identification of compound intervals.

This is similar to the method I use when teaching the identification of chord types. Whether the lesson is in triads or in seventh chords, I begin by playing all possible chord types with the same root while explaining the difference between each one as I go. I spend a lot of time with this idea while teaching seventh chords. I generally begin with a major seventh chord and then begin to lower pitches one-at-a-time until I have arrived at a fully diminished seventh chord of the same root. Once it is clear that the student understands this principal, I begin to spend more time with each chord discussing stability, construction, function, and tendency as well as asking
the student to invent his/her own verbal descriptions of the sound of each chord type. As the student becomes more comfortable with the identification of the chord types, I begin to ask more things of them such as singing the root of the chord to me (especially if it is an inversion), identifying various elements of the chord and their position within, and singing proper note of resolution of certain tendency tones.

Once the student feels comfortable with the identification of intervals and chord types, I begin to spend more time with harmonic progressions. For this exercise, I ask the student to sit without staff paper and to listen to the progression as I play it at the piano. I select a key and begin to improvise in four-voice block chords, stopping on each chord for the student to name the chord function within the key. This exercise combines everything that the student has worked on up to that point. He/she should be listening for bass line movement, for chord quality, and for the location of each member of the chord. I generally spend time going back and forth between various chords several times to secure the sound of any particular harmonic movement within his/her ear. As the student becomes more comfortable with this exercise, I begin to ask more by selecting one voice to be aurally “traced” through the entire progression. Coinciding with the student’s progress through written theory, I introduce chromatic harmonies once they have learned about it in an analytical setting. An exercise that I use for extending hearing is through the use identification of non-functional harmonic progressions. Like the other form of harmonic dictation, I intend only for the student to sit and listen, then identify. I play triads and seventh chords with no harmonic function or relation to each other. I name the first chord for the student, then ask him/her to identify the note name of the root, and quality of the chord for me. This helps to expand the ear for chord progressions in any type of music.

In all of these aural exercises, students are asked to sing, whether he/she is working with intervals, chord types, tendency-tone resolutions, or rhythmic/melodic dictation. I believe that the key in the ability to dictate rhythms and melodies is in the ability to sing and understand their function. I begin by choosing melodic and rhythmic examples from the student’s own literature for them to sing. This makes the work seem more applicable to him/her, and can last a long time depending on what the student is working on at that time. Once we run out of that material, I begin to bring in other materials for the student to sing. I have always achieved results that are satisfactory to me from the students that I take through these exercises. I feel confident in this
system and it will now be strengthened by the new ideas and knowledge gained through the evaluation of the following sources.

**Evaluation of Books:**


**Order of Chapters:**

- Part I: Listening Skills
  - Identification of Basic Features
  - Preliminary Listening Skills
  - Melodic Dictation
  - Polyphonic and Harmonic Dictation
  - Other Listening Skills
- Part II: Reading and Performing Skills
  - Fundamental Reading and Performing Skills
  - Sight Reading
  - More Complex Reading Skills

This book acts primarily as a guide for teachers of aural skills. Karpinski goes to great length to discuss the workings of the mind and ear as one, while evaluating virtually every known source of ear-training studies. Many scientific studies are cited and discussed while describing Karpinski’s suggested method for ear training. In the Chapter *Identification of Basic Features*, Karpinski points out that before a student can be dictating melodies or even identifying intervals, he/she must be able to recognize such elements as texture, timbre, tessitura and resister, tempo, dynamics, and articulation. These principals begin in a very simple manner with discussion of pulse and meter in which the student is taught to dictate simply the pulse of an example. Once this is comfortable, he/she will be ready to learn how to translate what has been written into an actual meter. Karpinski is very interested in the development of ability to hear pitches in this book and is the only of the authors to discuss the notion of pitch memory, its use, and its development. Along with the discussion of pitch hearing and memory, the important topics of inference of tonic, perception of melodic contour, identification of scale degrees, identification of intervals, identification of scale degrees, solmization systems for preliminary listening skill, and absolute pitch (and how to train students that have it).
Karpinski is clear about his opinion of current practices in the teaching of melodic dictation and the fact that is inadequate (as is discussed in his section titled The Inadequacies of Melodic Dictation). A technique for dictation called Protonotation is then introduced in which the student draws vertical lines to show pulse, horizontal lines for note duration, and solfege syllables for perceived scale degrees that have been heard. According to Karpinski, this method is quicker and less troublesome for students than standard melodic notation. Once a student is comfortable with what they have written with the protonotation it is easy to translate it to standard notation and check the final answer. This is the door to a different kind of musical perception. Karpinski offers the following model for music perception and cognition during dictation:

- **Hearing**: A student must have the capacity to fully focus while doing a dictation exercise in order to place what they have heard into their short-term memory.

- **Short-term Melodic Memory**: Much detail is given on how short-term memory works in relation to the perception of a melody and how it can be developed.

- **Extractive Listening**: “Extractive listening is a combination of focused attention and selective memorization.” One model for this type of hearing is to simply try to hear halves (or phrases) of the melody played.

- **Chunking**: The development of the skill to immediately recognize larger features (chunks) of the music such as scalar passages, triads, repetitions, sequences, modulations and rhythmic patterns.

- **Conclusion**: “Short-term musical memory is a capricious thing, complicated by the length and complexity of the material to be remembered, disrupted by thwarted expectations, and affected in various ways by a host of other factors. Dictation and the many concomitant activities that can improve and increase short-term musical memory also go a long way toward improving musicianship in general.”

The primary goal behind everything discussed in this book is a greater musical understanding for the student, because with understanding comes greater ease in all things musical whether in sight-singing/reading or performance.

Once all of these initial exercises have taken place, Karpinski finally introduces a method for melodic dictation. In this discussion, Karpinski address what information should be given beforehand and what should not be, proper tempi, duration between playings, and number of playings. Regarding the appropriate number of repetitions for a melodic dictation example,
Karpinski offers a detailed mathematical explanation based on how much information is in any given example. In the following flowchart, Karpinski offers what he believes to be the desirable dictation process:

For each playing:
- Hear
- Remember
- Understand
  - Temporal
    - Pulse
    - Meter
    - Rhythmic proportion
  - Pitch
    - Tonic
    - scale degree of starting pitch
    - scale degree of subsequent pitches
    - stepwise groups
    - each skip treated as new starting pitch
- Notate
  - What has been heard, remembered, and understood.

The next subject touched upon that is rarely addressed by other sources is in Karpinski’s chapter Assessment Tools and Evaluation Rubrics. In this chapter, along with evaluating the few ear-training resources available that do contain assessment in some form, offers the following proposal:

1. Correct and evaluate the rhythms first
2. Correct and evaluate the pitches in light of the corrected rhythms
3. Evaluate other details of notation
4. Look for obvious sources of errors and offer meaningful, usable feedback.

When addressing polyphonic and harmonic dictation, Karpinski stresses the importance of learning to hear both melodies simultaneously rather than separately. If a student can hear the function of the melodic lines as they relate to each other, he/she will have a better understanding of what is truly happening in the music. As harmonic dictation is concerned, Karpinski makes the point that the student should be listening for harmonic progressions and function rather than trying to hear four separate melodies and should be able to strongly build things from the bass line. Karpinski closes the first section of the book with the discussion of several other skills regarding listening such as transcription, instrumental playback, error detection and correction,
advanced hypermeter, Large-scale features (form and key areas), identification of various compositional devices, identification of pitch collections, and aesthetics.

Part two of Karpinski's book addresses reading and performance skills such as vocal production, solmization systems, inculcating scale and solmization, establishing collection and tonic, establishing pulse, tempo, and meter, aural imagery prior to sound production, and reading from protonotation. Karpinsky comes to the conclusion after researching numerous studies that some sort of Solmization system in sight-singing and in hearing is useful to students. This is followed by thorough discussion comparing fixed- and moveable-do systems. It points out that for students practicing new clefs, transpositions, or even simple note learning, fixed-do is desirable. Students learning the tonal roles played by individual notes are better off with moveable-do. A connection is also drawn to written theory and its usefulness in understanding of tendency tones such as le or fi. The next step in developing comfort with solmization is in singing the major scale. For students who have trouble with the moving notes, a drone note on the tonic or dominant (or both) may be played to help the student. Through this, the student will begin to develop comfort in the association of solmization syllables with pitches from the scale. From this point, the student should use various patterns and sequences to gain comfort with the syllables. The book draws attention to the study by Jorgen Jersild in "functional progressions" using note-pair resolutions such as: 7-1, 5-1, 6-1, 4-3, 6-5, 2-1, 5-3, #5-6, #4-5, b7-6. These studies may also offer help to a student in hearing the tendency of certain tones within a tonal framework. Karpinski says the following about this topic: “With the conscientious practice and execution of these scalar exercises, sequentials, and resolution and tendency-tone patterns, musicians can gain some fluency at singing with syllables and will begin to associated specific syllables with particular scale degree functions.” Aural imagery prior to sound production is a concept rarely addressed in other sources. Tonal/Atonal by Ronald Herder is the only other book addressed here that includes the topic. The discussion in this book is not quite the same as in Herder. Here, Karpinski is referring to the ability of hearing something internally before it is played. Herder’s method will be addressed later. The last major section of the book addresses the skill of sight-reading and covers the idea of scanning music before sight-reading looking at every possible aspect of the score, and hearing as much of it as possible with the inner ear before singing (or playing). The final thoughts addressed by Karpinski are in regards to some more complex reading skills. The skills presented are: various
types of chromaticism, modulation, proportional tempo or meter changes, clef reading, transposition, score reading, conducting as a set of aural skills, and reading Schenkerian graphs. Karpinski offers the following concluding thoughts:

“All of the aural skills discussed in this and previous chapters should become as generalizable and practical as possible. Musicians should be able to use both long-held and newly learned aural skills in a variety of settings. In various roles—for example, as performers, conductors, composers, arrangers students, teachers, scholars, editors, and copyists—musicians can apply their aural skills to all their musical activities. Practicing, rehearsing, performing, listening, composing, arranging, conducting, studying, and teaching are but a few of the circumstances in which musicians can draw on their aural skills. Anywhere there is music to be heard, read, or made, aural skills should be at the ready.”


**Order of Chapters:**
- Calisthenics:
- Dyads: Melodic Motion and Harmonic Structure
- Processes: Pitch, Pitch Class, and Contour Relations
- Trichords: Sets of Three Elements
- TetraChords: Sets of Four Elements
- Sets of More Than Four Elements

This book has many great features and a few potentially negative ones. The introduction and the first chapter entitled *Calisthenics* are both great. The introduction discusses the primary problem in the performance of modern music, which he traces to a lack of understanding of
expression within the harmonic language. The idea behind the focus of this book is to explain the expression of atonal music and to teach a student how to hear it. The Calisthenics for the ear that are introduced in the first chapter are as follows: Singing by imitation, hearing spatially adjacent pitches, memorization, hearing verticalities, transferring melodies to verticalities, two-part exercises, dictation after singing, dictation without singing, dictation of verticalities, and more advanced two-part examples. This initiates the initial work on the part of the student in the understanding of atonal melodies. In the chapter entitled Dyads, Friedman is quick to do away with the use of standard interval names such as P4, m3, M6 and so on because of their tonal implication. The next step is for Friedman to explain the basics of Pitch-class-set theory beginning with new interval names based solely on the number of half-steps within them using a mod12 system. This is followed by the discussion of a solmization system using pitch-class numbers for sight-singing in which C=0, C-sharp=1, D=2……A=9, A-sharp=10, and B=11. For the pitch-class numbers seven and eleven, the syllables “sev” and “lev” are used. I think that on one hand, the destruction of old interval names in this book is an interesting thought, but on the other hand could easily create more confusion and trouble for the student. I believe that certain intervals with always have their own tendencies regardless of a tonal or atonal context. By the time a student is learning to hear atonal music, the old interval names are so ingrained in them that to try and make them think of these various intervals in a different way could be detrimental. The exercise of thinking of the intervals only as a collection of half-steps, however, could act as a good refresher in the way a student hears things. In the end, this method would probably have to depend on the student at hand and how they are prone to learning. I agree without question, however, with the use of pitch-class numbers as syllables in the sight-singing of atonal music. I feel that some sort of solmization system for sight-singing is useful for tonal and for atonal music. It gives slightly more meaning to the notes that are being sung and their relation to the context in which they exist. Every Chapter of the book introduces new principals of pitch-class-set theory and how it pertains to what they are singing and hearing. At times, the information may get a bit thick for younger students, but with a good teacher, the concepts are within the reach of any capable student. Were the average student to attempt to work through this book on his/her own, it would prove a daunting task due to the advanced analytical material in every chapter. If a student (or teacher) is liberal with the use of the book, though, it can be an incredible tool. The exercises are introduced
in a very appropriate order of difficulty and there are several great things to work though within the chapters including beginning work on hearing different clusters (up to four elements). The book also includes a very lengthy appendix of musical examples to be sung (or heard in dictation). Working through this book in the order of exercises without worrying too much about the set theory portion of it and not using the book’s interval naming system seems like a perfect introduction to the world of hearing, sight-singing, and performing atonal music.


**Order of Chapters:**
- Major and minor second
- Perfect fifth
- Major and minor thirds
- Examples of melodies from the repertoire (Application exercises for chapters I-III)
- The Tritone
- Minor sixth
- Major sixth
- Examples of melodies from the repertoire (Application exercises for chapters IV-VIII)
- Minor seventh
- Major seventh
- Example melodies
- Compound intervals

This is a well-written book in the order of material introduced. The examples and exercises are introduced one small part at a time as can be seen from the chapter listing. The organization of having example from the repertoire after the introduction of every two or three new topics works very well. Like the Friedman book, this book also deals with the identification of clusters. There are more cluster exercises in this book than in Friedman, but Friedman offers more discussion on the technique of hearing the clusters. In general, this book offers little coaching on how to hear and sing the material. This does not mean it is not a good source. It has enough examples and
exercises within to keep student very busy and for a student to be very proficient after truly working through the exercises. Like the Friedman book, Edlund begins the book with a set of preparatory exercises. They are as follows:

a. The phrase is sung from the music
b. The teacher gives the first note and plays the phrase. The pupil sings it on the names of the notes without looking at the music and without accompaniment.
c. Play the phrase. The same as (b) except the pupil repeats the phrase on his instrument
d. Locate deviations from the notation. The pupil sees the music. The teacher plays or sings the phrase with a few wrong notes. The pupil analyses the wrong notes.
e. Dictation. The teacher gives the name of the first note, plays the phrase. The pupil sings the phrase and writes it down.
f. Sing or play the phrase again at a different pitch. This exercise is of special importance in the case of pupils with different forms of absolute pitch.


**Order of Chapters:**
- Definitions and brief discussion of Tonality, Chromaticism and Atonality.
- Semitones and Whole Tones / The Minor and Major 2nd
  - The Minor and Major 3rd
  - Consonance, Dissonance and “Hearing Ahead”: The Idea of Silent, Inner-Ear Projection
- Four Short Dissonance Studies: The ChromaticHalfStep (Augmented Unison) / The Augmented 2nd and 3rd / the Diminished 3rd
- Chromatic Half-Steps, 2nds and 3rds in the Literature (Diatonic, Chromatic and Atonal Examples for Further Study)
- The 4th and 5th (Perfect, Augmented and Diminished)
- Tonal / Atonal: Chromatic Transformations of Melodies with 4ths and 5ths
- 4ths and 5ths in the Literature (Diatonic, Chromatic and Atonal Examples for Further Study.
- The Minor and Major 6th / The Perfect Octave
- The Minor and Major 7th
Three Short Dissonance Studies: The Augmented 6th / Diminished 7th / Diminished Octave
- 6ths, 7ths and Octaves in the Literature
- The Octave: Gateway to Wide-Leap Melodies
- Seven Summary Studies

This book covers the middle ground between the Friedman and Edlung books. Numerous helpful exercises and examples are given as well as a very different kind of coaching than exists in the Friedman book. Herder begins by briefly discussing tonality and the construction of major and minor scales as well as how to hear and sing them. Herder teaches atonal hearing as an extension of tonal hearing rather than a completely different world as Friedman does. Once the basics of tonality have been reviewed, Herder presents excerpts of tonal melodies from the repertoire to be sung or dictated (or both), then begins to alter the melodies one element at a time until an entirely different melody exists. As in each of the other books, the types of intervals are introduced one-at-a-time using melodies focused on the intervals at hand. The atonal alterations of these melodies are meant for the student to practice hearing (and singing) the different qualities of any given interval. This is a very effective approach. The most important concept introduced in this book that does not exist in the others is in the chapter Consonance, Dissonance and “Hearing Ahead”: The Idea of Silent, Inner-Ear Projection. This is perhaps the most useful tool for musicians to hear unfamiliar leaps in a passage while sight-singing it (or while simply trying to hear it in his/her head). This is the idea of projecting un-notated but easy to find pitches in your head to get you to next notated unfamiliar pitch. An example of this would be to imagine a perfect fifth above the starting pitch when you have been asked to sing a minor sixth. If you are not confident finding the minor sixth, it is perhaps a great deal easier to hear the perfect fifth plus a minor second. One can project an octave when asked to sing a compound interval of some sort to decrease the size of leap that must be heard in the ear.

All three of the books for atonal ear-training discussed above (Friedman, Edlund, and Herder) are very good books and are worth owning for any student of music. All three offer rather different approaches to the art of developing aural skill for atonality and should all be used regularly if for no other reason than variety of training and exercise. The types of coaching offered
in book are all helpful in very different ways. The understanding of Pitch-class-set relations explained by Friedman is good knowledge to have and not too difficult to comprehend at the level in which it is introduced. The approach of varying the quality of intervals used by Herder is likely the most understandable and gentle approach to expanded harmonic understanding for the student. The Edlund book is useful for a student simply in the sheer volume of examples given for the student. This is a quality of all three of the books. Once all of the concepts have been introduced, there are more than enough excerpts for the student to practice and refine skill.

Computer Applications:

*MacGamut* ear training software is the best computer application for ear-training that I have come across. It is also very affordable at $35. There are multiple areas of aural skills trained and tested by *MacGamut* and it is fully customizable once the initial exercises have been exhausted. This application offers exercises in hearing intervals, scales, chords, rhythmic dictation, melodic dictation, and harmonic dictation as well as keyboard drills for intervals, scales, and chords. In the interval and chord exercises, the student is evaluated on the proper identification of the interval or chord as well as their own proper spelling. In the melodic and rhythmic dictations, the student must properly beam and tie the rhythms in the examples, correctly place bar lines, and of course in the case of melodic dictations, display the correct notes on the screen.

The program *Practica Musica* by Ars Nova Software is very similar in nature to *MacGamut*. The features and interface of the newest version are flashier than *MacGamut* and does a few things that *MacGamut* does not, such as polyphonic dictation. *Practica Musica* offers several tools in the teaching of written music theory that are not in *MacGamut* either. These extra features along with the flashy interface make *Practica Musica* a considerably more expensive application than *MacGamut*. The current version of *Practica Musica* retails at $100 for a downloadable copy or $125 for a CD Rom copy. Due to the difference in cost between these two applications, I prefer *MacGamut*.

Two smaller and more specific applications not currently commercially available but in use in the University of Northern Colorado Music Technology Center are Shaw's TRET (*Tone Row Ear Training*) developed by Dave Shaw and *Soprano-Type-Bass Web-based Ear-Training Tool* developed by Paul Coleman (both former students of UNC). Shaw's TRET is a remarkable program in training
tone rows and intervals. The user sets the parameters of each exercise on his/her own. The user chooses which intervals to be included in the example, how large of a range the row should cover, how many intervals to include, the speed at which the row is played, and how many times a row may be repeated when the user is in test mode. Two menus are given at the bottom of the window for every interval of the row. One menu is for the user to choose the note name of every note played (the first note is given) and the second box is to choose the interval between each of the notes. Once the combination of a correct interval and a correct note name is made, a checkmark appears. Once all note names and all intervals are correct, the user may move on to the next example. This program is wonderful for what it does. It can be used for effectively in very short or long sessions since the practice mode works on an example-to-example basis rather than requiring the user to complete a long series of exercises. Because of this, it is easy for the user to open the application and do one or two exercises when he/she has a free moment.

The Soprano-Type-Bass program is also an example-by-example program. It is very narrow in it’s scope and capability, yet still has it’s purpose. When the user clicks the “play” button, a triad is played. The user must decide what the quality of the chord is as well as what members are in the bass and soprano positions of the chord. There is nowhere for a student to show the answer so he/she must just decide what the answer is, then click the “show answer” button to see if he/she heard it correctly. Like Shaw’s TRET, this program works well to supplement the exercises used by the larger programs and to look at certain aspects in more detail.

New Personal Approach to Ear-Training:

My view of ear-training methods has been slightly altered through the course of this study. For the most part, my methods remain the same as they were before with one large difference. Singing has become a far larger and more important part of my own studies and in my tutoring of others. The resources offered in the Friedman, Herder, and Edlund books have become my favorite resources. The excerpts found in these books can be used for sight-singing or dictation exercises. I have seen in my own personal work what a large difference there is to be had from singing unfamiliar melodies. In my new approach, singing is as much of a focus as anything else. I (or my students) will sing intervals, melodic patterns, rhythmic exercises, and chord members along with the dictation work that was already done. The acquisition of aural skills is something that
requires both time spent alone, and with the help from others (or computer applications). The
time alone can be spent singing, and in analyzing sounds and progressions as they appear
personally to the ear of the student. When this work has been done, the work done with peers or
with computer applications will be more fruitful because the student is then able to really test the
knowledge gained during personal study time. Ear-training is something that needs to be done
regularly by all musicians. Once a musician has reached a certain point of ability with the ear, the
need only maintain that ability through occasional exercise. A good ear is something that can be
lost if the student is not careful and diligent in his/her study. The ear is the most valuable asset to
any musician, and it must be tended to with the same care one would give to his/her own
instrument.