Journal of Music Theory Pedagogy

Volume 27 Article 3

1-1-2013

Playing With Motives - Aural Skills Exercises for Tonal Structure

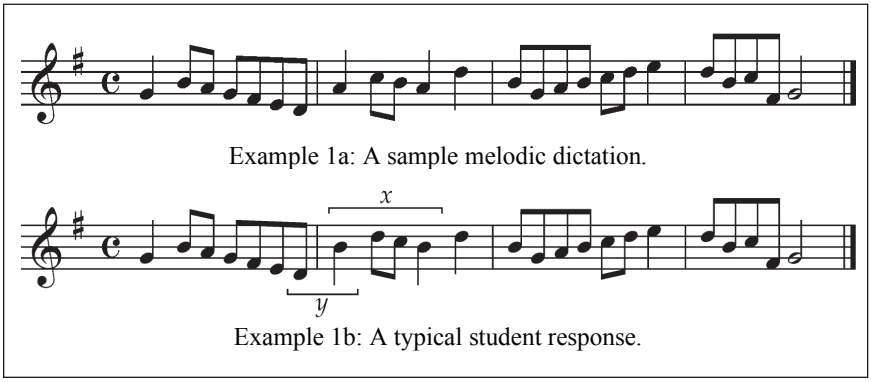
David Castro

Playing With Motives: Aural Skills Exercises for Tonal Structure

By David Castro

The type of musical comprehension that is the goal of dictation exercises depends entirely on the cognitive systems that are available to students in order for them to make sense of what they are hearing. There are many such cognitive systems, including the diatonic scale, 4/4 meter, phrase rhythm, and so on, and each one of them allows us to give meaning to the individual events in a given piece or fragment of music. It is just this sort of meaning that the discipline of music theory engages and it is this sort of meaning that we want our students to learn.[1]

Consider the following error that is typical of student work. Example 1a shows a melody that was played in class and was to be notated by the student; Example 1b shows what the student actually notated. The error in the student work occurs under the bracket labeled *x*. Notice that these four notes are incorrect in that each one of them is one diatonic step higher than what was played, but that they are correct in that they consist of an ascending third followed by two descending steps. In other words, the contour of these four notes is correct, but they were notated one diatonic step too high.



Example 1a: A sample melodic dictation.

Example 1b: A typical student response.

Examples 1a and 1b

[1] The author would sincerely like to thank Music 112 (Fall 2010) and Music 214 (Spring 2012) for being willing to try something new and for their invaluable feedback and advice.

One school of thought among aural skills teachers would interpret this error as the result of a failure to recognize the melodic interval above the bracket labeled *y* in Example 1b, a perfect fifth from D up to A. That interpretation follows from the fact that had that interval been heard correctly, the three pitches that follow it also would have been correct. However, cognitive research tells us that the source of this error is not in the absolute distance from D up to A, but that it is in the recognition of *re*,[2] which is the goal of the leap and the first scale degree in that contour. Michael Rogers' comments reflect this fact in that no. 6 in his list of twelve specific suggestions for getting the most out of the classroom experience of melodic dictation includes the following statements: "Development of a sensitive feel for the psychological location and the pulls and attractions of each pitch within the major/minor system is one of the goals of doing dictation in the first place. ... This approach is both more musical and useful than trying to compute intervallically from point to point."[3] This admonition is based as much on a philosophical orientation as on a practical one, since Rogers is not specifically addressing the type of error that is my concern here. Nevertheless, these words are valid in terms that are both philosophical and practical, for the "sensitive feel" he would have us instill within our students is precisely the key to success in overcoming errors of this type.

The primary purpose of this article is to present a few aural skills exercises that focus directly on students' schematic familiarity with the diatonic scale, enabling them to recognize and/or reproduce scale degrees quickly and accurately. However, because it may not be clear exactly why I am introducing a new type of aural skills exercise, I will begin with a brief summary of the cognitive foundations for *Playing With Motives* in order to precisely define the cognitive systems these exercises engage and reinforce. Following that, I will present the exercises themselves.

Cognitive Foundations

In the chapter on melodic dictation in *Aural Skills Acquisition*, Gary Karpinski notes that accuracy in melodic dictation is

[2] In this article I will refer to all scale degrees using movable-*do* and *do*-based minor solfège.

[3] Michael Rogers, *Teaching Approaches in Music Theory*, 2nd ed. (Carbondale and Edwardsville: Southern Illinois University Press, 2004), 114.

dependent on the innate mechanisms that govern the encoding of melodies in memory. Citing the relevant music perception literature on the subject, he writes, "Such reports point to evidence for two separate memory encoding mechanisms: one that encodes the contour of a melody—its direction and step-versus-leap shape—and another that encodes specific pitches, at least of starting notes of stepwise groups."[4] By "specific pitches," Karpinski is here referring to scale degrees within a diatonic context, and the basis of this model for melodic memory lies in numerous cognition studies conducted by W. Jay Dowling, Carol Krumhansl, and others.[5] The watershed moment in this regard seems to be Dowling (1978), which established the model of melodic memory and processing that is based on contour and scale degree. In this paper Dowling synthesizes several experiments and observations, ranging from ethnomusicological research to experiments conducted by Helmholtz in the 19th century to contemporary experiments, including several conducted by Dowling himself, in order to arrive at his model. Subsequent studies confirmed and refined his findings, including Yi (1990), which extends the concept of "contour" from pitch to rhythm in order to show their interdependence in the memory and processing of melody.[6]

In his 1978 study Dowling uses the term "scale degree" to denote the mental process of assigning meaning to a given pitch within a tonal context, but this term refers not to a mental construct, but to a product of that construct. Therefore within cognition literature the preferred term for this phenomenon is now tonality, which means the mental construct by which we orient ourselves toward a single pitch and hear other pitches as being related to it in a hierarchical relationship.

To be fair to the importance of intervals in melodic memory, there is evidence pointing to the fact that some melodic processing is in fact based on intervals, as such. Dowling (1986) shows that experienced listeners employ a combination of strategies when asked to compare melodies in terms of difference, identity,

[4] Gary S. Karpinski, *Aural Skills Acquisition* (New York, London: Oxford University Press, 2000), 66–7.

[5] See the bibliography at the end of this article for a list of resources.

[6] Current thinking in this regard is summarized in Schmuckler (2009), in which melodic processing is presented as involving two basic organizational structures, tonal structure and melodic contour, the very elements established in Dowling (1978).

or similarity, including both tonal structure (i.e., scale degree information) and purely intervallic information. However, such studies differ with the concerns of the aural skills classroom in that what is asked of aural skills students transcends simple measures of similarity and difference. These students are asked to accurately assess and engage complex technical aspects of melodic notation and structure. Furthermore, the occasional use of intervals in order to understand or identify melodic events does not negate the importance of tonality, which remains a more fundamental system.[7]

The type of tonality at work in the currently accepted model of melodic processing is also reflected in the three types of musical memory discussed by David Huron in *Sweet Anticipation*, namely episodic, dynamic, and semantic. Huron describes episodic memory as "a sort of autobiographical memory that holds specific historical events from our past."[8] In the case of music, this type of memory is at work any time we recognize a bit of music that we have heard more than once and has been encoded in long-term memory. This is music that becomes known to us, or familiar. By contrast, dynamic memory is akin to short-term memory in that it allows us to process the unique events that occur within a single piece, as we are hearing it. Although these are both important parts of melodic memory, the most important type of memory for the purposes of this paper is semantic memory, which relies on established mental schemas. "Schemas are generalizations formed by encountering many exemplars."[9]

I have already mentioned that one of the two fundamental schemas in the processing of melody is tonality, and numerous studies confirm both the existence of and our reliance on such schemata as scales and modes in order to organize our perception of pitch. Krumhansl & Keil (1982) elucidates three stages in the acquisition, or acculturation, of a scale. "The developmental pattern was one in which the acquisition of the tonal hierarchy proceeded in an orderly manner, with the first distinction made being that between the scale and non-scale tones. Once the possible

[7] For more on the importance of intervals see Dowling & Bartlett (1981). For a view on the pedagogical importance of intervals see Lake (1993).

[8] David Huron, *Sweet Anticipation: Music and The Psychology of Expectation* (Cambridge, Massachusetts: MIT Press, 2006), 220.

[9] Huron, *Sweet Anticipation*, 225.

pitches of the tonal system were isolated, finer differentiation was made within the set of scale pitches."[10] This "differentiation" was manifested in demonstrable preferences for diatonic scale degrees over chromatic ones, and for members of the tonic triad over other diatonic scale degrees.

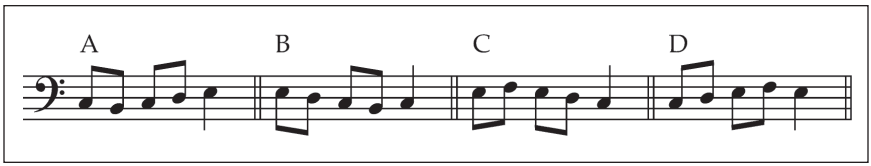
In addition to the difference between their function within our processing of music, there is yet another fundamental difference between episodic and schematic memory, which is that we have direct access to events held in episodic memory, but we do not have total access to schematic memory. In other words, we can actively recall a melody that has been encoded in long-term memory, but there really isn't a way to directly engage the underlying tonal schema within which it operates. To be sure, we can activate schemas and can be aware of them at arm's length (so to speak), but the memories themselves are of a different kind and function, residing in the background of our mental processing.[11] Dowling (2002) makes this clear when referring to knowledge of this kind as implicit. "Neither the knowledge base itself nor the cognitive processes through which it is applied are entirely accessible to consciousness."[12] The exercises described in this article therefore ought to be understood as a method for giving students awareness and deliberate reinforcement of their schemas for diatonic pitch space, even if direct access isn't possible.

In summary, the C+T model asserts that the two essential aspects of melodic processing and memory are contour and tonality, with the latter being a type of schematic memory. Therefore, aural skills students will benefit from systematic exercises that directly engage their schema for the diatonic scale. This is possible only by focusing their attention on the identity of individual elements within that schema and what follows is a set of exercises that do just that.

[10] Carol L. Krumhansl and Frank C. Keil, "Acquisition of The Hierarchy of Tonal Functions in Music," *Memory & Cognition* (1982) 10/3: 249.

[11] This may seem counter-intuitive at first, because one may object that of course we can sing a scale, or sing *do*, and so on. However, to sing a scale or to sing *do* is not to access the schema itself. Rather, these activities are possible *within* or *because of* the schema, which is operating in the background, giving meaning to what we sing.

[12] W. Jay Dowling, "The Development of Music Perception and Cognition," in F*oundations of Cognitive Psychology: Core Readings*. Ed. by Daniel J. Levitin. (Cambridge, Massachusetts: MIT Press, 2002), 482.



Example 2: Four versions of a single motive.

Playing With Motives: The Basics

The exercises that I refer to as *Playing With Motives* (*PWM*) require that students focus on scale degrees in a way that traditional melodic dictation does not.[13] This is because in *PWM* melodic contour is a (near-)given, thereby isolating scale degree as the indeterminate variable. Example 2 provides four permutations of a single motive, labeled A, B, C, and D, respectively. These four versions of a basic contour will constitute all of the melodic material that is used in this exercise—at least in the initial stages.[14]

The exercises of *PWM* are based on the employment of brief melodic contours, such as those given in Example 2, because they provide the student with a ready musical "object" that can be learned quickly and positioned within diatonic space with relative ease. A motive lies between a full melody, which is too unwieldy

[13] I use the term "motive" in this article to refer to melodic contours, a usage which is not original to me. The following passage from Pearsall and Schaffer (2005) is representative: "In this article, we advocate a return to analysis based on ordered motives long advocated by such theorists as William Benjamin, Jonathan Bernard, and Richmond Browne. Building on the ideas of these theorists, we propose an approach to analysis and aural skills that emphasizes germinal melodic ideas, ideas that form the basis for musical organization within individual pieces, yet transcend the boundaries of the various isms and schools. We will refer to these germinal ideas as motives. While motives can take on a number of different forms ranging from abstract ideas to highly-prescribed pitch/rhythm designs, defining motives according to shape (contour) and intervallic content alone produces quite rich results when applied analytically and aurally to twentieth-century music." (58)

[14] The relationship between these motives is derived from standard twelve-tone operations, which are themselves derived from the treatment of thematic material in 18th-century counterpoint: motive B is the retrograde of motive A (R of P), motive C is the inversion of motive A (I of P), and motive D is the retrograde of the inversion (RI of P).

for the purposes of these exercises, and a single pitch, which lacks even a modicum of melodic interest. It is also for the sake of melodic interest that I use four closely related versions of one basic contour. To be clear: the motives are not the point of this exercise. However, it is only while working with an object such as a motive that the student can activate his or her schema for the diatonic scale, which *is* the point. The core concept of *PWM* is the free transposition of a motive within the diatonic scale for the purpose of focused and deliberate practice in the recognition and recall of each scale degree, as such.

The first step in this exercise is to have students establish a secure sense of tonic. This can be done in two different ways, which can be thought of as the active and passive forms of tonal orientation. The passive form is that familiar routine in which the instructor plays a brief chord progression at the piano, such as I-IV-V-I, which students listen to in order to orient themselves to the given tonal center. I call the second type active orientation because it requires students to sing a brief prepared melody that orients them to the tonal center of their choice.[15] When students are first learning such melodies they need to be sung out loud, but they should also learn to audiate them (i.e., to sing them "in their heads").[16]

After establishing a secure tonic, the instructor proceeds by using a set of motives, such as that given in Example 2, in the manner of a dictation or in the manner of a singing exercise. When conducting a singing exercise, the instructor declares which form of the motive students are to sing, then tells them the scale degree on which they are to begin. After a brief pause, which allows students time to recognize the form of the motive they are to sing and to audiate the starting scale degree, a clear direction (e.g., some kind of conducted downbeat) is given by the instructor and students sing the requested motive. This exercise can be done with just one student, a small group of students, or an entire class. It is advisable that all three of these arrangements should be used. While having the entire class sing in unison is the most efficient way of giving everyone the

[15] For more thoughts on this process see Edward Klonoski, "Teaching Pitch Internalization Processes," *Journal of Music Theory Pedagogy* 12 (1998), and Karpinski, *Aural Skills Acquisition*, pp. 151–154.

[16] The term "audiate" is taken from Gordon (1976), and is analogous to "visualize." Both terms refer to the mental representation of a sensation that is not physically present. Karpinski's term for this skill is "auralize," and it has precisely the same meaning.

opportunity to practice, having students sing individually prevents them from simply copying what they hear others singing. Note that during singing exercises the feedback to the student is virtually instantaneous as they can compare what they sing with what they audiated just before they began singing, in addition to what they might hear from classmates in the moment.

When conducting *PWM* as a dictation exercise, the instructor plays various forms of the motive at the piano at various diatonic pitch levels while students write down which version they hear and the scale degrees on which it begins and ends. Based on feedback from students, my own practice has been to play each prompt twice, and to leave a fair amount of time between prompts. In addition, I project the four motive forms at the front of the room, thus avoiding the need to memorize the label for each version, although an argument could be made for the value of having students memorize them.

The answers provided by the student can take several forms. One type of response could consist of writing out "A, *mi*-*sol*," indicating that the student heard the A form of the motive starting on *mi* and ending on *sol*. Note that the order of these two pieces of information is given in the most typical order of recognition; during dictation students readily recognize the form of the motive before they are able to situate it in diatonic space. A second type of student response would be to notate the answer on staff paper within a given key, just as one would during a melodic dictation exercise. Finally, a student could simply give a verbal response.

The orienting activities mentioned above ought to be repeated throughout the lesson, as necessary, in order to refresh the student's sense of tonal orientation. As the time since the most recent orienting activity increases, the student's memory for *do* fades, which is why exact transpositions of a motive are apt to confound the beginning student during dictation. For example, the A form of the motive given in Example 2 is intervallically identical when it begins either on *do* or on *fa*, so the student must distinguish between these two answers based solely on their sense of tonal orientation. The goal, of course, is for student performance in this aspect of *PWM* to improve with time and practice, requiring fewer orienting activities for the same number of prompts.

Anecdotal evidence from students suggests two strong tendencies while taking part in these exercises. First, when listening to dictations, students report paying more attention to the last note

than to any others in the motive. This is because they typically audiate a stepwise motion from that last note back to *do* in order to determine its identity. This "gap-fill" technique provides a very reliable measure because students identify *do* with greater speed and accuracy than any other scale degree. Karpinski supports this technique for identifying scale degrees, saying that it allows students to go "from the unknown to the known." He also notes that "as listeners become more familiar with the tonal functions of the pitches they traverse, they can begin to identify the scale degrees of pitches on that more meaningful and immediate basis."[17]

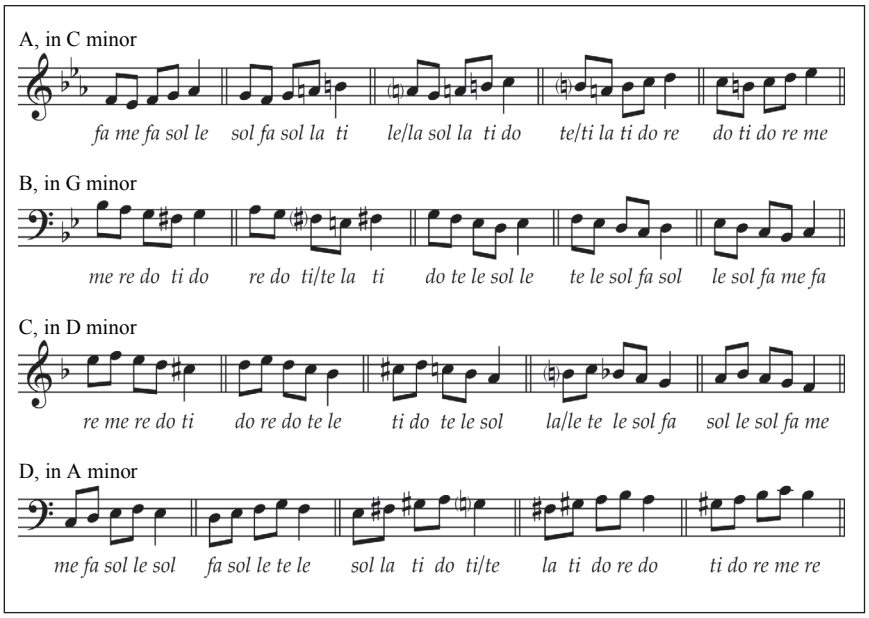
The second general tendency among students occurs when they are asked to sing the motive at various diatonic pitch levels. In that context students report paying special attention to the first pitch, then singing the remaining notes by tracing the contour of the motive in diatonic space. In the process of doing this students learn that some scale degrees are audiated more quickly than others. The pattern is predictable, with *do*, *mi*, *sol*, and *ti* being scale degrees that students are able to audiate quickly. Scale degrees *re*, *fa*, and *la* require more time, or even the audiation of a stepwise relationship from one of the more stable scale degrees, in order to be located reliably.[18]

Under certain circumstances students will have to be aware of the need to switch from one octave to another while singing. As always, range considerations come to bear when singing these exercises, and because students tend to follow the path of least resistance—a phrase which here means that students always choose the smallest interval from one scale degree to another—it is possible for them to be lead into a vocal range in which they are no longer able to produce the motive correctly without first transferring it to an adjacent octave.

This exercise should also be done in melodic minor, which presents certain challenges with regard to scale degrees $\hat{6}$ and $\hat{7}$. When used as a singing lesson, melodic minor requires students to anticipate whether the raised or lowered version of those scale degrees would be most appropriate. That decision often depends, of course, on the direction of the line. Example 3 is a guide to usage for the motive given in Example 2, with the most typical responses

[17] Karpinski, *Aural Skills Acquisition*, 51.

[18] See Krumhansl, *Cognitive Foundations of Musical Pitch* (New York, London: Oxford University Press, 1990), 16–76, for more on defining and representing the tonal hierarchy.

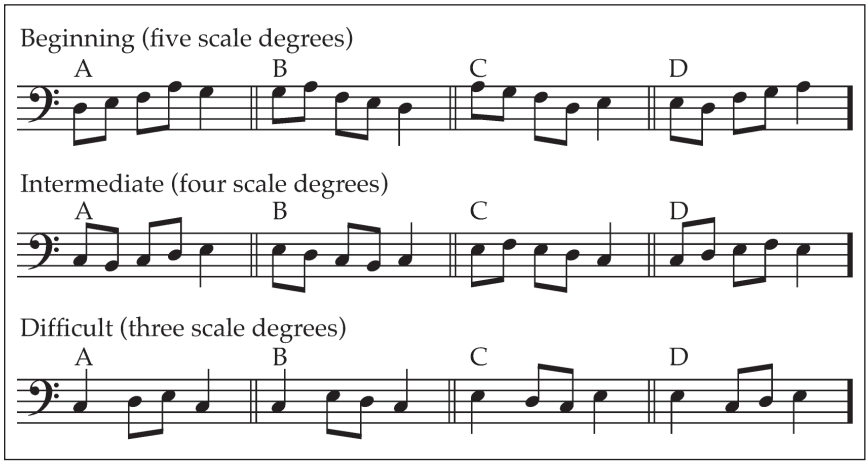


Example 3: Sample interpretation of a motive in melodic minor.

given in both notation and solfège syllables. Because it isn't always clear which version of the scale degree should be used, two options are occasionally given, signified by accidentals in parentheses and alternative solfège syllables separated by a slash. Note that the motives in this graphic are not necessarily meant to be sung in the order given.

Regarding the design of a motive, there is an inverse relationship between the number of discrete scale degrees in a motive and the difficulty it poses to the student, especially in dictation exercises. Whereas we might think that a simple neighbor motion would be easier than the motives provided in Example 2 (possibly because fewer notes means fewer things to think about), the reality is that a motive with fewer discrete scale degrees reveals less information that students can use as they try to situate it within tonal pitch space. When tonally orienting figures are provided infrequently students are required to retain the sound of *do* mentally. Failing that, they revert to listening for half-steps and whole-steps, using the arrangement of those intervals in the motives they hear in order to guess at the identity of scale degrees. Therefore one of the easiest melodic segments to work with might be a perfect fifth that has been completely filled in with steps, due both to its simplicity and to the fact that it contains enough scale degrees (i.e., half-steps and

whole-steps) to be almost conclusive with regard to its position within the scale. After that, a motive containing four scale degrees (such as the one given in Example 2) might be appropriate, and then a three-note motive would be even more challenging.[19]



Example 4: Three graded motives.

Example 4 provides three graded motives for use as students progress in their accuracy. Within diatonic space, the beginning motive contains two transpositionally equivalent (i.e., "real," as opposed to "tonal") pairs for each version of the motive: A, *do-fa* has the same intervals as A, *sol-do*, and A, *re-sol* has the same intervals as A, *la-re*. The three remaining transpositions are unique, giving beginning students a relatively low number of opportunities for confusion.[20] The intermediate motive has three transpositionally equivalent pairs: (1) A, *do-mi* and A, *fa-la*, (2) A, *re-fa* and A, *la-do*, and (3) A, *mi-sol* and A, *ti-re*. A, *so-ti* is the only unique transposition of version A.[21] The difficult motive has three identical sets: A, *do* is the

[19] The concepts and techniques of *PWM* can also be extended into post-tonal (i.e., fully chromatic) space. In order to do so, students could be asked to recognize and/or sing various permutations of a given ordered set (e.g., simple transposition, inversion, and/or retrograde).

[20] Note that the "beginning" motive contains five discrete scale degrees, but not as a simple stepwise scale segment. That is because such a scale segment wouldn't produce four unique motive forms, as does the motive provided.

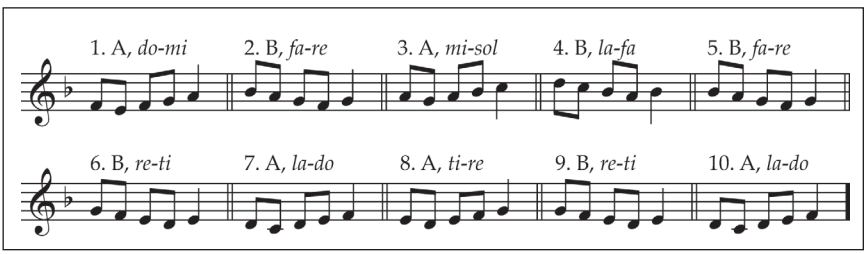
[21] Versions B, C, and D each contain the same number of transpositionally equivalent pairs.

same as both A, *fa* and A, *sol*; A, *re* is the same as A, *la*; and A, *mi* is the same as A, *ti*. The difficult motive has no unique transpositions.

Thus far I have presented the basics of *PWM*, which consists of using four versions of a single motive as either a dictation exercise or as a singing exercise. With guided practice of no more than five or ten minutes a day, students quickly come to recognize which scale degrees they struggle with and which ones they can recall and audiate without difficulty. This metacognitive information should guide students in their practice and study.

Pedagogical Strategies

There are various techniques for structuring an exercise in such a way that it is relatively easy or relatively difficult. For example, students easily recognize stepwise connections between one motive and the next. If a student is asked to sing the A form of the motive given in Example 2 starting on *do*, the motive will end on *mi*, so the easiest way to continue would be to have students sing the A form again, starting on *mi*. This not only repeats scale degree *mi*, but also repeats the A form of the motive. To increase the level of difficulty you can have the next motive be a different form and/or have it start on a scale degree that is just one step away from *mi*, *re* or *fa*. The variables here are versions of the motive and stepwise connections between successive motives. These variables can be used independently or in combination.

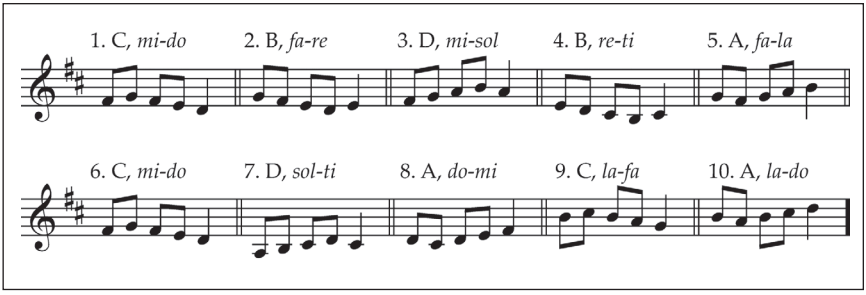


Example 5: Sample singing lesson no. 1.

I will now turn to several sample lesson plans (many of which were used with my sophomore class in the spring of 2012) in order to show how all of this might be put to real use.[22] Example 5

[22] Unless it is specifically mentioned, these lesson plans assume that the instructor is periodically singing or playing a tonally orienting figure. Also, these lesson plans are designed using the motive forms given in Example 2.

provides an ordered list of motive forms and scale degrees for use in a singing lesson. Motive identifiers and solfège syllables are given above the staff, while the notes to be sung are given in the key of F. This lesson is designed as a beginning or even introductory one. As such, only two motive forms are used, one ascending and the other descending, and they are deployed in such a way that each motive begins on or within one step of the note that ended the preceding motive. Furthermore, note that nos. 1–4 trace an ascent from *do* up to *sol* and the *la* just above it, that nos. 4–7 trace a descent to the *la* an octave below, and that nos. 7–10 remain in the lower portion of that octave. These three embedded sets lend coherence to the entire exercise and help students assimilate the essentials of *PWM* while also appreciating the overall melodic shape.

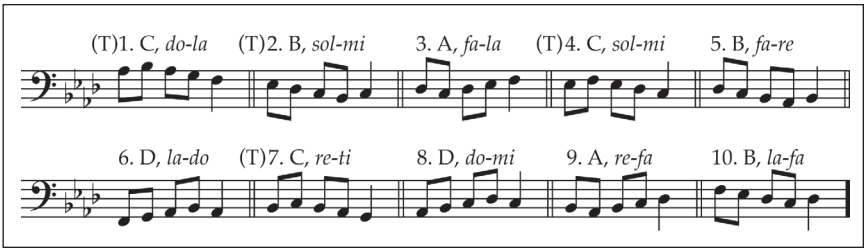


Example 6: Sample singing lesson no. 2.

Example 6 provides a second, more challenging singing lesson. The greater difficulty of this lesson derives in part from the diversity of motive forms (all four are used), as well as the leaps between ending and beginning scale degrees. Furthermore, some of those leaps are to scale degrees that are unstable, and therefore more difficult to audiate. For example, no. 8 ends on *mi* and no. 9 begins on *la*, which can present challenges within a single uninterrupted line, let alone when combined with a mental break and the additional task of preparing to sing a new motive form. The transition from no. 5 to no. 6, in which *la* is followed by *mi*, serves as a sort of preparation for the later and more difficult leap in the opposite direction.

A second challenge involved in singing lesson no. 2 can be found in the octave shifts required by motive no. 7. Notice that motive no. 6 ends on *do* and that in order keep no. 7 within a singable register sopranos and tenors might need to sing no. 7 an octave above the notated register. As a result, the *ti* that ends no. 7 would lead

most closely to the *do* an octave above that given in no. 8, bringing sopranos and tenors up to a high F♯. Hence, a second and more awkward octave shift would most probably occur between nos. 8 and 9, as sopranos and tenors begin no. 9 on the *la* below the *mi* on which no. 8 concluded. For the same reason, altos and basses would probably need to sing nos. 9 and 10 an octave below the notated register.

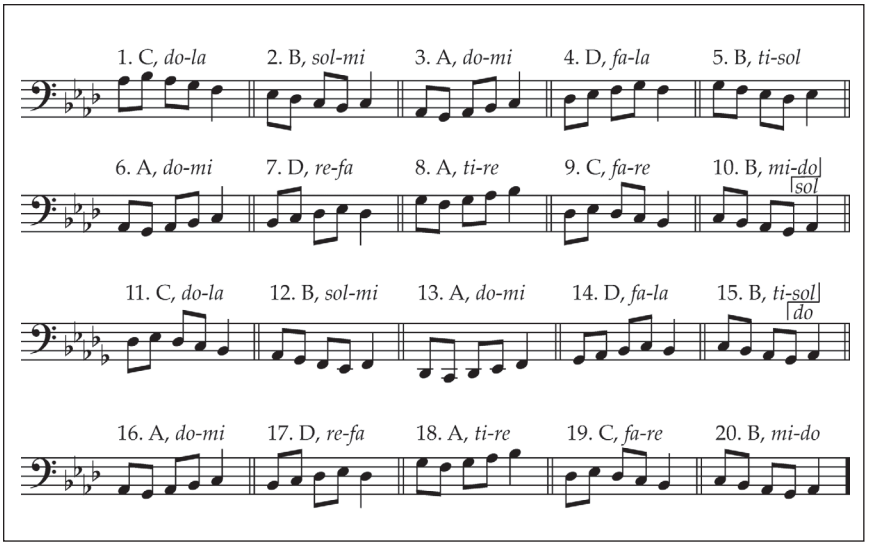


Example 7: Dictation lesson no. 1.

A dictation lesson is given in Example 7. Although this example is given with direct stepwise connections between motives, it is also possible to displace some of them by an octave, thereby reinforcing the octave equivalence of scale degree function. Notice also the symbol (T), which here serves as a prompt for the instructor to either play or have students sing an orienting progression. Since these motives are most typically dictated on the piano, the most efficient option is to play an orienting progression at these points in the lesson.

If all prompts are to be answered before the correct answers are announced by the instructor then the feedback students receive is somewhat removed from the event. The student must wait for all of the prompts to be heard and answered before learning of their success or failure on the very first one. However, it is possible to turn such a problem into a pedagogical opportunity. One rather effective way of gradually introducing greater difficulty into a single set of prompts is to give fewer opportunities for tonal orientation as the set progresses. For example, in a ten-prompt dictation set the instructor might play an orienting progression before nos. 1, 2, 4, and 7 (as shown in Example 7), thereby requiring students to maintain the sense of tonic for a longer amount of time and across an increasing number of prompts. This effectively divides the ten-prompt set into mini-sets of gradually increasing size and difficulty. As with many of the variables in these exercises,

the frequency of orientation is ultimately at the discretion of the instructor, so it is advisable that advanced classes should hear an orienting progression less frequently (e.g., only before nos. 1 and 5).



Example 8: Singing lesson no. 3, with modulation.

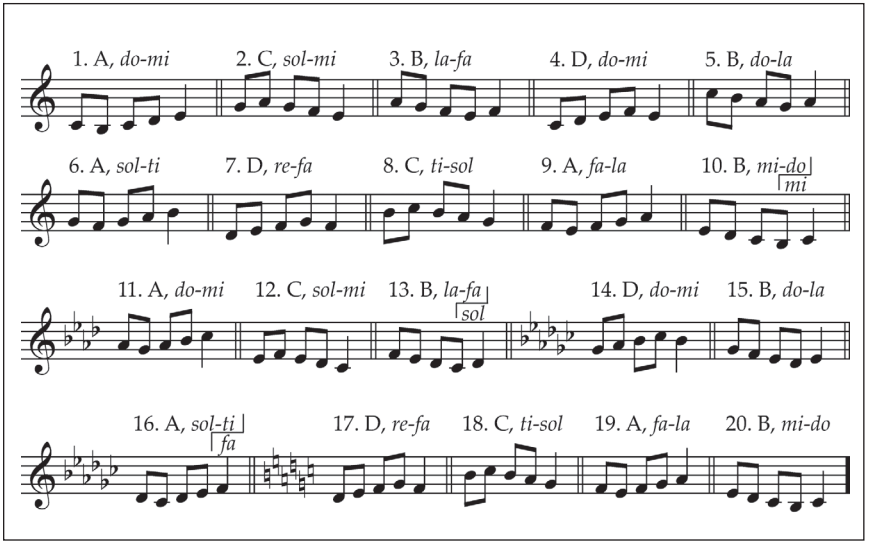
Advanced Techniques

One of the most obvious and natural extensions of *PWM* is in the practice of singing modulations. Example 8 provides a sample singing lesson that consists of a ten-motive set that is sung twice through (no. 1 = no. 11, etc.), with modulations at two points in the lesson. The modulations are shown as pivots in the solfège syllables while the notation simply reflects the change in key with a new key signature. In order to effect these modulations students may sing an orienting melody out loud. In advanced courses they may audiate an orienting melody, after which they should attempt to sing nos. 11 and 16 out loud.

Several details in this lesson are worth mentioning. First, these modulations will be relatively easy to perform because the pivots between keys involve the two most stable scale degrees, *do* and *sol*, both of which are easy to audiate. Second, each of the motives that is to be sung after modulating begins on the new *do*. Third, the tonal path of this lesson is from A♭ to D♭ and back to A♭, which can provide an excellent opportunity to check the accuracy of the student/class in holding pitch from the beginning of the lesson to

the end. Finally, students will immediately notice that nos. 2 and 3 both end on *mi* and will instinctively use that information to gauge their success. ("I recognize that note because the last one ended on it too.")

It is worth observing that the ability to hear and recognize scale degrees that are held in common between exercises is exactly the type of pitch connections that we encourage our students to make as a natural part of musicianship. A greater facility with the recognition of scale degrees can only serve to enhance a student's ability to recognize medium- and long-range pitch connections within a given piece and such observations are integral to a complete analysis.



Example 9: Singing lesson no. 4, with difficult modulations.

A far more challenging take on this basic modulation exercise is given in Example 9. Several elements have been altered in order to raise the level of difficulty in this lesson, one of which is the frequency of the modulations. The most challenging aspect, however, involves the scale degrees on which the pivots take place. The first modulation asks students to reinterpret *do* as *mi*, a pivot that effects a modulation to a chromatic submediant (♭VI). This is a difficult modulation to audiate, but it is mitigated somewhat by the fact that the next motive begins on the new *do*, providing a stable scale degree on which to commence the new key. The modulation following no. 16, however, provides no such stability. Not one of

the three scale degrees involved (the last note of no. 16, the scale degree that pitch is to be reinterpreted as, and the first note of no. 17) is a member of the tonic triad.

A lesson on modulations need not be as elaborate as those provided in Examples 8 and 9. A simpler take on this skill would be to have the class sing any form of the motive on *do* in C major (as established using a piano, if the instructor does not have perfect pitch), and then have them sing that motive again on the same scale degree, but in a different key. One could explore the closely related keys of F major and G major, or explore more remote relationships, such as D major or A♭ major. In addition to being simpler to plan, this technique has the advantage of taking up less class time.

A second extension of *PWM* is to include various chromatic inflections of these diatonic scale degrees. It would be a simple thing to introduce chromatic neighbor tones into this exercise, but consider also the employment of *fi*, which implies a motion to the dominant through V/V harmony, *le*, which engages modal mixture when it appears within the major mode, and *ra*, which signifies Neapolitan harmony. These are just a few of the obvious possibilities that result from integrating *PWM* with relatively basic chromaticism. Another idea is to extend *PWM* into the careful study of the diatonic modes. A third idea is to do these exercises with arpeggiated triads or seventh chords, requiring students to recognize the scale degrees within each chord and to provide its Roman numeral.

It would also be possible to employ *PWM* in simple call and response lessons. In its most basic form, such a lesson would include students simply repeating what you sing, perhaps supplying the solfège that you omitted. Another form would be to have students work in pairs where one of them sings a motive and the other responds with the same motive, but a step below or above the original. These exercises would improve not just schematic familiarity with the diatonic scale, but pitch matching skills and facility with solfège. Furthermore, these exercises can be taken as an introduction to improvisation, the study of which frequently begins with call and response exercises.

Yet another extension of *PWM* would be to employ it as a part of keyboard skills. Students could be called upon to play various motive forms at various diatonic pitch levels in a given key, or they could work in pairs in a call-and-response exercise. Non-pianists would benefit from being able to focus on a single line (perhaps

played by both hands, an octave apart) as they gain familiarity with the topography of the keyboard and with transposition skills. Moreover, this exercise would be invaluable to all students because working at the keyboard provides an experience that is visual, aural, and kinesthetic, thereby reaching various cognitive processing centers all at once.

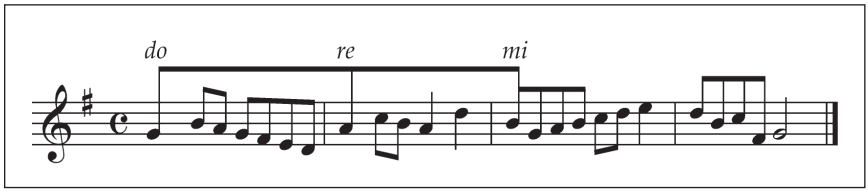
Each one of the exercises described above engages the core concept of *PWM*, which is the recognition and recall of diatonic scale degrees that are realized in the form of brief melodic figures. Although these exercises are more than enough to keep a class busy and learning, especially given all of the other skills that need to be practiced on a daily basis, the reader should by no means consider this coverage exhaustive. The core concept of *PWM* is remarkably flexible and allows for almost limitless variations on the basic singing and/or dictation model. No doubt the reader has thought of at least one novel adaptation while considering the options I have provided and instructors are encouraged to be creative in the ways that they choose to implement these exercises in their own classrooms.

Summary & Conclusions

Music cognition research has established contour and tonality as the two fundamental schemas involved in the processing and memory of melodies. As such, these two areas are worthy of focused attention as students work to improve not just their performance on melodic dictation exercises, but also their metacognitive skills as musicians. The exercises described in this article are designed to focus on tonality in general, and the recognition and reproduction of scale degrees specifically. Given the importance of repetition in the acquisition of learning (through a process known as statistical learning) it is clear that students will benefit from the carefully controlled environment of *PWM*, during which they can give full attention to engaging and reinforcing their existing schema for the diatonic scale.

Deliberate training in aural skills enables students to make detailed and meaningful observations about music, whether these observations are for the enhancement of a performance or for analysis *per se*. Returning to the student error shown in Example 1b, the original point was that the true nature of the error was a failure to recognize *re*, as such. To take it a step further, though, a

failure to recognize *re* further prevents the student from hearing the structural ascent that occurs in the first three downbeats, in which *do* ascends through *re* on its way to *mi* (Example 10). An observation such as this provides students with a melodic scaffold, enabling them to fill in details around these structural tones.



Example 10: Reprise of Example 1a, showing stepwise ascent on the first three downbeats.

Furthermore, as Michael Rogers writes, "Success in melodic dictation does not depend on mastery of intervals or other fragments. ... The goal in melodic hearing is to comprehend the local movement of pitches through a system of structural points of reference."[23] This type of musical comprehension is enhanced by *Playing With Motives*, which improves student familiarity with the topography of the diatonic scale and provides a valuable step in the direction of mature and thoughtful musicianship.

[23] Rogers, *Teaching Approaches*, 110.

Bibliography

Deutsch, Diana, editor. *The Psychology of Music*. Second edition. San Diego, London: Academic Press, 1999.

Dowling, W. Jay. "Context Effects on Melody Recognition: Scale-step versus Interval Representations." *Music Perception* 3/3 (1986): 281–296.

_____. "Melodic Contour in Hearing and Remembering Melodies." In *Musical Perceptions*, edited by Rita Aiello, with John A. Sloboda, 173–190. New York: Oxford University Press, 1994.

_____. "Scale and Contour: Two Components of a Theory of Memory for Melodies." *Psychological Review* 5/4 (1978): 341–354.

_____. "The Development of Music Perception and Cognition." In *Foundations of Cognitive Psychology: Core Readings*, edited by Daniel J. Levitin, 603–625. Cambridge, Massachusetts: MIT Press, 2002.

Dowling, W. Jay, and Dane L. Harwood. *Music Cognition*. Orlando, Florida: Academic Press, Inc., 1986.

Dowling, W. Jay, and James C. Bartlett. "The Importance of Interval Information in Long-term Memory for Melodies." *Psychomusicology* 1/1 (1981): 30–49.

Dowling, W. Jay, Aron Barbey, and Laura Adams. "Melodic and Rhythmic Contour in Perception and Memory." *Music, Mind, and Science* 1 (1999): 166–188.

Gordon, Edwin E. *Tonal and Rhythm Patterns: An Objective Analysis*. Albany, New York: State University of New York Press, 1976.

Huron, David. *Sweet Anticipation: Music and The Psychology of Expectation*. Cambridge, Massachusetts: MIT Press, 2006.

Karpinski, Gary S. *Aural Skills Acquisition: The Development of Listening, Reading, and Performing Skills in College-Level Musicians*. New York: Oxford University Press, 2000.

_____. "A Model for Music Perception and Its Implications in Melodic Dictation." *Journal of Music Theory Pedagogy* 4/2 (1990): 191–229.

Krumhansl, Carol L. *Cognitive Foundations of Musical Pitch*. New York: Oxford University Press, 1990.

Krumhansl, Carol L., and Frank C. Keil. "Acquisition of The Hierarchy of Tonal Functions in Music." *Memory & Cognition* 10/3 (1982): 243–251.

Lake, William E. "Interval and Scale-Degree Strategies in Melodic Perception." *Journal of Music Theory Pedagogy* 7 (1993): 55–67.

Oura, Yoko. "Constructing a Representation of Melody: Transforming Melodic Segments into Reduced Pitch Patterns Operated on by Modifiers." *Music Perception* 9/2 (1991): 251–266.

Patel, Aniruddh D. *Music, Language, and The Brain*. New York: Oxford University Press, 2008.

Pearsall, Edward, and John Wm. Schaffer. "Shape/Interval Contours and Their Ordered Transformations: A Motivic Approach to Twentieth-Century Music Analysis and Aural Skills." *College Music Symposium* 45 (2005): 57–80.

Rogers, Michael R. *Teaching Approaches in Music Theory: An Overview of Pedagogical Philosophies*. Second edition. Carbondale and Edwardsville, Illinois: Southern Illinois University Press, 2004.

Schmuckler, Mark A. "Components of Melodic Processing." In *The Oxford Handbook of Music Psychology*, edited by Susan Hallam, Ian Cross, and Michael Thaut, 93–106. New York: Oxford University Press, 2009.

Snyder, Bob. "Memory for Music." In *The Oxford Handbook of Music Psychology*, edited by Susan Hallam, Ian Cross, and Michael Thaut, 107–117. New York: Oxford University Press, 2009.

Tighe, Thomas J., and W. Jay Dowling, editors. *Psychology and Music: The Understanding of Melody and Rhythm*. Hillsdale, New Jersey: Lawrence Erlbaum Associates, Inc., 1993.