

Dalcroze's Approach to Solfège and Ear Training for the Undergraduate Aural Skills Curriculum

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INTRODUCTION

Swiss composer and pedagogue Emile Jaques-Dalcroze (1865-1950) is most widely known as the creator of eurhythmics—a movement-to-music approach that engages the moving body in musical training. Today, eurhythmics is taught around the world, with the central unifying principle of connecting movement to music.

Eurhythmics, however, is just the tip of the iceberg. The Dalcroze approach is made up of eurhythmics, solfège, and improvisation. Dalcroze believed the combination of these was essential to a complete musician's training. Ideally, elements from each branch blend, resulting in an education that stresses musical motion, sensitivity to harmonic function, and improvisation—skills especially applicable to the training of performing musicians.

Much has been written about eurhythmics as an approach to training musicians through movement, and this has largely overshadowed Dalcroze's other pedagogical innovations.¹ His extensive ear training and solfège exercises—devised during his tenure as Professor of harmony and solfège at the Geneva Conservatory (1892-1910)—are largely unknown to all but those who have had Dalcroze training. His solfège texts have never been published in English.² This article aims to introduce some of these exercises—which we believe are immediately applicable in traditional aural skills curricula—to a broader audience.

¹ Please see an annotated bibliography of select Dalcroze Eurhythmics sources in Appendix A.

² These include *Exercices Pratiques d'Intonation* (Practical Exercises for Intonation), Luasanne: Jobin et Cie, 1894, *Les Gammes et Les Tonalités, Le Phrasé et Les Nuances* (Scales and Keys, Phrasing and Nuance, in three volumes), Lausanne: Jobin et Cie, 1906, and many other smaller volumes of music for sight singing. His *Préparations pour une méthode de Solfège Rythmique Vocal* (Preparations for a Method of Vocal Rhythmic Solfege), Luasanne: Jobin et Cie, 1925 is an approach to teaching rhythm, and will not be discussed in this article.

Dalcroze's approach to teaching aural skills consists of exercises and games designed to develop facility in hearing function and harmonic context, even in highly modulatory music. Because it is a set of tools, not a specific sight singing or dictation sequence, it can be incorporated into any traditional undergraduate aural skills sequence. The exercises also work well in the music theory classroom as an effective aural/sensory tool to complement verbal explanations of tonal concepts.

In this article we present three types of exercises drawn from Dalcroze's solfège and ear training pedagogy: I. C-to-C Scales, II. Scalar Fragments, and III. Harmonic Proof Improvisations. Together these exercises have the primary goals of helping students develop:

- An acute awareness of half- and whole-steps
- Sensitivity to scale degree function
- Knowledge of one's position at all times within a tonal context
- The ability to sing and recognize a modulation to any key instantly
- Improvisatory skills

Some of the exercises we present are of our own invention, others are taken directly from Dalcroze's writing, but most have been passed down to us by leading Dalcroze practitioners in Dalcroze eurhythmics workshops. Workshops are the time-honored approach for training students and teachers in the Dalcroze method.³

Most of the exercises described here are introduced aurally, without written notation. Students listen and sing, repeating or altering what they've heard, with and without clues from the piano. Students are encouraged to improvise; the frameworks are carefully designed to guide them. The teacher can assess what students know by hearing what they invent. Written notation is used for clarification and further understanding, but it typically follows the aural experiences.

³We are indebted to many Dalcroze teachers from whom we received our training. In particular, we would like to thank: the late Robert Abramson, Gabriella Chrisman, Anne Farber, Herb Henke, Stephen Moore, Lisa Parker, and the late Marta Sanchez.

Many Dalcroze exercises are games—an effective pedagogical strategy that promotes active learning and models specific musical behaviors essential for the developing musician.⁴ The games and exercises we present range in difficulty from relatively easy (singing scales from notes other than tonic with support from the piano) to advanced (improvising modulatory phrases). All are variants on the common theme of connecting functional hearing with note names, and teachers should select exercises that are most appropriate for their students. By choosing exercises matching the ability levels of our respective students, we have used these exercises with a diverse range of students: music majors at both a liberal arts university and conservatory, advanced high school students, community college students, and graduate music education students.

ON SOLFÈGE SYSTEMS

Like most Europeans, Dalcroze used a fixed-Do system. In his writings on solfège, he suggested implementing altered syllables to reflect sharps and flats. Sharps were given an “-è” ending, and flats an “-eu” ending; double sharps were given an “-iè” ending, and double flats an “-ieu” ending.⁵ Today, however, the method is taught using the more traditional form of fixed-Do. All types of “F,” regardless of accidental, are called “fa.” Having students not name the accidentals has some advantages that we explain later in the article. The fixed-Do system names pitches, not their function. Among the main strengths of Dalcroze’s approach for those teaching with fixed-Do is that it brings awareness of function (contextual meaning) into a solfège system that might otherwise ignore it.

For those of us teaching in America, where moveable-Do is more widely used, the Dalcroze approach can have a converse benefit: it can help raise awareness to pitch (phenomenological naming) within a solfège system that might otherwise ignore it.

⁴ The approach is similar to the gaming techniques Deborah Rifkin and Diane Urista introduced in their article, “Developing Aural Skills: It’s Not Just a Game,” *Journal of Music Theory Pedagogy* 20 (2006): 57-78. We encourage the reader to consider using these games as preparation for, or in conjunction with, the more advanced scale degree and modulation exercises and games introduced in this article.

⁵ Emile Jaques-Dalcroze, *Les Gammes et Les Tonalités, Le Phrasé et Les Nuances*, p. 14.

This awareness helps students translate their functional hearing more directly to and from musical notation and an instrument. (Appendix B contains suggestions for teachers using moveable-Do to help make these exercises work most efficiently in that context.)

The real benefit of Dalcroze's approach is that it fuses contextual and phenomenological thinking, since each exercise requires students to be aware of both.

Dalcroze's exercises easily adapt to any singing system, but they are most effective when an absolute system (letter names/fixed-Do) is combined with a relational system (scale degree numbers/moveable-Do). This combined approach prepares students for fluent sight singing and dictation of highly modulatory music by enabling them to think functionally within the context of all major and minor keys.⁶

I. C-TO-C SCALES

The C-to-C scales are Dalcroze's most significant contribution to ear training pedagogy. These scales are often referred to as "Dalcroze Scales" or "Do-to-Do Scales." The C-to-C Scales develop:

- Sensitivity to scale degree function and functional transformation/modulation.
- The ability to conceive of any tone as any scale degree function.
- An acute awareness of whole- and half-step patterns for all keys.
- Knowledge of one's position within a tonal context at all times.
- A strong memory for C, and the ability to identify the key of a musical passage based on the function of C within the passage.

Introduction To C-To-C Scales

C-to-C scales are major and minor scales performed within one octave (C4 to C5 for women; C3 to C4 for men). In keys where C is

⁶Two of the authors use a combined fixed-Do/scale degrees system at their respective institutions, and one uses a combined moveable-Do and letter names system. Two of the authors would like to personally thank William Marvin from the Eastman School of Music for introducing them to this combined approach. For a more thorough discussion of solfège systems and the use of a combined phenomenal and contextual approach, see Marvin's "A Comparison of four Sight-Singing and Aural-Skills Textbooks," *JMTP* 22 (2008): 131-148. [see esp. pp. 137-9].

sharped or flatted, they are performed from C $\sharp$ to C $\sharp$ or C $\flat$ to C $\flat$. Minor scales are sung in the harmonic and melodic minor forms. Tonic is often sung following the scale itself for a sense of closure. See Example 1.⁷

B $\flat$ Major Dalcroze Scale, followed by tonic:

Fixed-Do: Do Re Mi Fa Sol La Si Do Si La Sol Fa Mi Re Do Si
Letter names: C D E $\flat$ F G A B $\flat$ C B $\flat$ A G F E $\flat$ D C B $\flat$

Moveable-Do: Re Mi Fa Sol La Ti Do Re Do Ti La Sol Fa Me Re Do
Scale Degrees: 2 3 4 5 6 7 1 2 1 7 6 5 4 3 2 1

D Minor Dalcroze Scale, followed by tonic:

Fixed-Do: Do Re Mi Fa Sol La Si Do Si La Sol Fa Mi Re Do Re
Letter names: C $\sharp$ D E F G A B $\flat$ C $\sharp$ B $\flat$ A G F E D C $\sharp$ D

Moveable-Do: Ti Do Re Me Fa Sol Le Ti Le Sol Fa Me Re Do Ti Do
Scale Degrees: 7 1 2 3 4 5 6 7 6 5 4 3 2 1 7 1

Example 1: B $\flat$ Major and D Minor Dalcroze Scales

At first glance, unaccompanied C-to-C scales look like modes (and certainly could be conceived that way); however, the purpose of C-to-C scales is to learn to perceive them not as modes, but rather as major and minor scales that begin and end on a scale degree other than tonic. This difference is highlighted by the way in which the scale is harmonized.

To demonstrate for yourself, sing a C Mixolydian scale on letter names or fixed-Do.

Example 2a: The Mixolydian Scale

⁷ As mentioned earlier, Dalcroze instructors traditionally use the fixed-Do system with no change of syllable for chromatic alterations in solfège exercises. However, these exercises can also be sung on letter names (without singing 'sharp' or 'flat'). In either system, instructors may ask the students to sing "sharp" or "flat" after a note, where the tempo permits, to aid in identification of the accidentals if they wish.

Now sing the same scale again with the following harmonization. Conclude the scale by singing F, its tonic.

Example 2b: F Major C-to-C Scale Harmonized

The harmonization transforms the dynamic structure of the scale, making it nearly impossible to hear it as anything but a diatonic F major tonality beginning and ending on scale degree $\hat{5}$. If heard as a mode, the ear accepts the lowest tone as the main tone. When heard as a major/minor diatonic scale, the ear searches for clues that will lead it to its tonic.

Now, play just the initial dominant seventh chord of the harmonization above, sing the scale again, and resolve by singing a tonic F at the end. The dominant seventh chord is enough to direct the ear into hearing this in the context of F Major. Finally, with no accompaniment from the piano, imagine the sound of that dominant seventh chord, and sing the scale and tonic one last time. Now the ear is providing its own harmonic support for the scalar melody. Practicing C-to-C scales increases one's sensitivity to melodic direction and tonal harmony, which, in turn, promotes more expressive performance.

Singing a C-to-C scale is like jumping midstream into a scale already in progress. This is one of many practical pedagogical advantages to learning C-to-C scales, given that scalar passages in music often do not start on tonic. Students learn to identify scales as they unfold in real compositions. The C-to-C octave also provides a fixed frame of reference to compare and internalize the dynamic makeup of all twelve major and minor tonalities. Dalcroze viewed modulation as a change of scale, and believed once students could immediately swap between any given scale and another, they could handle all modulations with ease.

PEDAGOGY OF C-TO-C SCALES: INTRODUCING NEW KEYS

The sequence outlined above for introducing the F Major Dalcroze scale provides a model of the classic approach used by Dalcroze instructors to introduce each C-to-C scale for the first time, and it is the sequence we recommend. Prompt the class by saying, "Let's sing an F Major scale from C-to-C," and play a C on the piano. Accompany the students' singing of the scale (perhaps in a strict chorale style as above, or in a freer classical or jazz style of your choosing; refer back to Example 2c). Have students resolve the scale by singing the tonic note (F) at the end. Repeat the process a second time, but this time play only the V7 harmony as support for the singing, and perhaps a closing I chord when the students sing tonic. Repeat the singing a third time, with no harmonic support from the piano, encouraging students to hold on to the memory of the sound of the V7 as they sing.

When you return to this same scale in a later class, instead of giving it harmonic support, you might test students' ability to summon a harmonic context for themselves by playing only the starting C and naming the scale. When only the starting note is played, students must think carefully about the half- and whole-steps as they sing the scale, until the ear orients itself and begins to supply a harmonic context for the key. As students gain familiarity with each key, it will take fewer and fewer notes for them to find this harmonic context, until eventually they can hear it from the starting C, C $\sharp$, or C $\flat$ alone.⁸

Once students have been introduced to the F major C-to-C scale, they are usually eager to move into other keys. We recommend G major, followed by other closely related keys. Continue to introduce scales throughout the semester until all have been introduced. Example 3 shows dominant seventh chords for supporting the major and minor C-to-C scales. For minor keys, we suggest using a V¹³ (the lowered scale degree $\hat{3}$ provides enough information to prompt the minor mode.) Note that middle C sits on the top of each chord; the dominant seventh chord transforms its function for each key.

⁸ Dalcroze wrote, "The first concern of the teacher must be to make the child appreciate the difference that exists between the *whole tone* and the *semi tone*. If the student grasps this difference only with hesitation, whether in singing or listening, there should be no thought of continuing to another subject." Emile Jaques-Dalcroze, *Les Gammes et Les Tonalités, Le Phrasé et Les Nuances*, 1.

F (C = 3) B $\flat$ (C = 2) E $\flat$ (C = 6) A $\flat$ (C = 3) D $\flat$ (C = 7) G $\flat$ (C = 4)

G (C = 4) D (C = 7) A (C# = 3) E (C# = 6) B (C# = 2) F# (C# = 5)

Example 3a: Dominant Seventh Chords for Supporting Major Dalcroze Scales

a (C = 3) d (C# = 7) g (C = 4) f (C = 5) b $\flat$ (C = 2)

e $\flat$ (C = 6) g# (C# = 4) c# (C# = 1) f# (C# = 5) b (C# = 2) e (C = 6)

Example 3b: Dominant Thirteenth Chords for Supporting Minor Dalcroze Scales (For the minor mode use a V $\flat$ 13; the lowered scale degree 3 provides enough information to prompt the minor mode).

EXPANDING THE C-TO-C SCALE MODEL: THE PROMPT, THE SCALE, THE CLOSING

As students gain familiarity with several C-to-C scales, the model for singing these scales can be expanded to add variety and challenge, to reinforce harmonic concepts from theory class, and to build musicality and improvisation skills. We refer to the three parts of the basic model for singing a Dalcroze scale as 1) the prompt, 2) the scale and 3) the closing.

The *prompt* tells students what scale they will be singing. A prompt can be musical or verbal. Prompts challenge students to

identify scale degree function, which benefits dictation work. The *scale* refers to variants in how the C-to-C scale itself is performed. These mainly include the scale's rhythm and what harmonic support (if any) is given from the piano. The *closing* is how the harmonic tension is resolved following the singing of a scale. Typically, the closing requires students to translate harmonic and functional thinking into an absolute solfège system (such as fixed-Do or letter names). Closings build the skills necessary for sight singing. They also provide opportunities for improvisation and creativity.

PROMPTS

In the context of our discussion on introducing new keys, we have already mentioned two methods of prompting a scale: 1) give the students the name of the key and an initial V7 to orient their ears to the key or 2) name the key and play only the starting C/C#/C♭, so that students must find the scale by half- and whole-steps or recalling a harmonic context for themselves.

It is also possible to use purely musical prompts, in which the students are given enough musical information to determine the function of C (its relative position in the scale) and, by extension, determine the name of the key itself. These musical prompts reinforce the work on key signatures and scales that generally takes place in a first semester theory course.

Mastery of these prompts enables students to identify scale degree function and harmonic context quickly. Prompts model the kinds of subtle changes in collection and scale degree function that listeners encounter when a tonicization or modulation occurs in a musical context. The goal is for students to discern the tonic of any given musical context instantly and effortlessly.

"V7 Plus C" Prompt:

Play one of the V7 chords with C on top from example 3a or 3b. Ask students to hum C, and if need be, hum up and down the scale to determine C's relative position in the scale. When they know how C is functioning, they should discretely hold up the number of fingers of its scale degree (or show its Kodály / Curwen hand sign). Once a majority of the class has the solution, have the class sing the scale together followed by an ending on tonic. (If C is sharped or flatted in the key, you can let students know this. Or, if they are

experienced in Dalcroze scales and have sung several already that day, they should be able to recognize the alteration of C.)

For instance, upon hearing a D7 chord with C on top, students show 4 with their fingers. They then sing the G Major C-to-C scale followed by the tonic. Work on speed until students can identify the function of C and /or tonic instantly from any aural prompt you play for them.

Alternately, with the same prompt, you can have the class sing the scale (without identifying accidentals) before they have had a chance to analyze how C is functioning, and encourage them to discover which note feels like tonic as they sing the scale. For an ending, the class might sing the scale degree function of C and identify tonic. See Example 4:

Example 4: V7 + C Prompt, E_b Dalcroze Scale, Function & Key Identifying Closing

For any aural prompt, as with V7 + C, you can have the class identify the function of C and the tonic before or after singing the scale when using a phenomenological system such as fixed-Do or letter names without singing accidentals. When we want students to sing without naming accidentals, we tell them so, to ensure that nobody gives away the answer until everyone has had a chance to figure it out.

If students struggle to find tonic before singing the scale, let them sing the scale and discover which note feels like tonic within the context of the scale. Repeat the process in another key, but encourage them to imagine singing the scale silently (audiating it) to find which note feels like tonic. In an advanced class, as a speed drill, you might give an aural prompt, have the class immediately identify the function of C and the name of the key, and entirely skip singing the scale.

"Scale as Prompt:"

Sing or play a C-to-C scale (harmonized or unharmonized), without giving tonic at the end, as a prompt. Students must listen very closely for (and remember!) the pattern of half- and whole-steps they hear.

"Whisk & Cluster" Prompts:

These are advanced versions of the scale prompt. For a Whisk, play the scale as quickly and dryly as possible before singing the scale. For a Cluster, play and sustain all eight tones of the scale at once before singing the scale.



Example 5: Whisk and Cluster Prompts

"Tritone Plus" Prompt:

This is the most challenging prompt. It should be played either in major or minor (tell the students which), since sometimes there will not be enough information for students to determine whether you intended a major or minor key.

Play only the tritone from $\hat{4}$ to $\hat{7}$ within the octave of C-to-C. Encourage students to imagine it resolving both inwards and outwards (since they won't yet have enough aural information to know how it will function in the key). Add C, and encourage the students to let the added note help them know which way the tritone resolves. Ask the students to identify the function of C and sing the scale.

Say: "This is the tritone; try to hear it resolving both in and out." "Now I'll add C. Let it help your ears know which way the tritone resolves, then show me the scale degree function of C with your fingers." (Long pause.) "Let's sing the scale."

The musical notation shows a piano introduction of the tritone (F and C) in both hands, held as whole notes. This is followed by a series of chords where the tritone resolves inwards and outwards. The final part shows the tritone with a C added, resolving to a C major triad, followed by the beginning of a C major scale. The notation ends with 'etc...'.

Example 6a: "Tritone Plus" Prompt

When C is part of the tritone, it is obviously not possible to add C as the additional note. Instead, tell the students which note of the tritone is C, and give them any other note. If you give $\hat{2}$ or $\hat{5}$ this is much easier; $\hat{1}$, $\hat{3}$, and $\hat{6}$ are quite challenging:

Say: "This is the tritone; the top note is C $\sharp$. Try to hear it resolve both in and out."

"Now I'll add a new note. Let it help your ears know which way the tritone resolves, then show me the scale degree function of C $\sharp$ with your fingers." (Pause.) "Let's sing the scale."

Example 6b: "Tritone Plus" Prompt when C $\sharp$ is in the Tritone

Discussing why it is possible to identify the scale from such sparse information is an excellent method for teaching the key-defining properties of a tritone. Students can be led to discover aurally that keys sharing tritones on the keyboard share no other notes and are themselves a tritone apart (i.e. if enharmonicism is evoked). This is a wonderful challenge for students in any semester of theory, but especially useful for pushing first year students, and worth returning to as a concept when augmented sixth chords and jazz tritone substitutions are introduced.

"The Changing Faces of C" Prompt:

This prompt models musical contexts with rapidly changing tonics and requires some improvisatory keyboard skills on the part of the teacher. Improvise around a C pedal point—in the bass, a middle voice, or in the uppermost voice (See Example 7 for one of many possible renderings). As students determine the scale degree of C, they should show it with their fingers. Once they have, bring the improvisation to a fermata. Cue the students to sing the scale, and accompany it in the style of your improvisation. On finishing the scale, continue improvising around the C pedal point, but shift (gradually or directly) to a new key, repeating the process. In the hands of a good improviser, students are content to play this game for many minutes, providing a chance to teach and communicate through music instead of words. For a speed version of this game, skip the scale entirely.

Example 7: "Changing Faces of C" Prompt

"Musical Context" Prompt:

Our final tonic finding prompt requires students to listen to a piece. Just after the piece has finished, play C on the keyboard. Dalcroze gives the following advice, "Without thinking of a particular scale, simply from the influence of the tune," sing the C-to-C scale. From this exercise, students learn to determine the key of a piece based on its relative relationship to C.⁹

⁹ Emile Jaques-Dalcroze, *Les Gammes et Les Tonalités, Le Phrasé et Les Nuances*, 106.

THE SCALE

As a teacher, you should decide how much harmonic support to give to the singing of the C-to-C scale proper: full accompaniment, a single chord, something in between, or nothing at all. Provide fuller accompaniment when students need harmonic support to understand a new or challenging scale, less when you want to challenge them to find their own harmonic context or focus closely on the half- and whole-steps. Although unaccompanied scales are in some ways more difficult, even advanced students benefit from and enjoy singing with a thoughtfully harmonized scale, and the harmonic choices you make will guide their expressivity and dynamic shaping of the scale.

It is usually best to choose a rhythm for the C-to-C scales, communicate it to students, and stick with it for a while. This can be a fixed rhythmic pattern, such as:



Example 8: Possible Rhythm for Singing C-to-C Scales

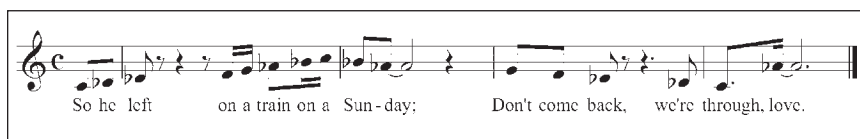
Or, you might choose a rhythm to highlight the arrangement of whole- and half-steps in the scale. For instance, ask students to sing whole-steps in quarter notes, and half-steps in eighth notes. See Example 9:



Example 9: Highlighting Half Steps with Eighth Notes in a B^b C-to-C Scale:

Try this yourself in any key; notice how far ahead you have to think to be able to do it. Dalcroze was particularly fond of games demanding this sort of mental attention.

You could also challenge students to write lyrics and a rhythm for each C-to-C scale, so that the scales become more memorable. The idea is to make the scale feel like a melody within the key, and the results can be quite musically satisfying. One possible solution for A♭ Major is given in Example 10:



Example 10: A♭ Major Dalcroze Scale Melody

The exercise is challenging, and provides a creative approach to mastering the basic forms of the C-to-C scales. Adding rhythms and words enlivens the scales, fostering a connection between abstract scales and real music. As with many Dalcroze exercises, this draws on another branch of the method: improvisation. As stated previously, in an ideal Dalcrozian approach, all three elements—eurhythmics, solfège, and improvisation—coalesce and reinforce one another. We will introduce other improvisatory activities below.¹⁰

“Scale Degree Mimes”

An important goal of the C-to-C scales is for students to learn the unique tendencies and characteristics of each scale degree. A particularly Dalcrozian way of teaching this is to involve movement. Students could be asked to invent a gesture or posture that best expresses the feeling of each scale degree. The central principle of eurhythmics—embodying musical features—is invoked in this exercise. Here, students at Interlochen Arts Camp act out a major scale from tonic to tonic:



Example 11: Scale degree mimes

¹⁰ We would like to thank Anne Farber, who teaches at the Dalcroze School of Music, in New York, for this idea.

When singing a C-to-C scale, students can take up each of these postures (or postures of their own creation) as they sing the appropriate scale degree. Doing this within the C-to-C scales has the added benefit of teaching students to simultaneously track pitch names and scale degree function through all of the keys.

While always moving like this could be tiring, and somewhat over simplifies the functional relationship of scale degrees (how different scale degree $\hat{1}$ feels as part of a $ii^{\frac{4}{2}}$ chord!), it invites expressivity, nuance and musicality into the aural skills curriculum. Whether they are moving or not, students should always be encouraged to perform scales musically and with sensitivity to scale degree function. In Dalcroze's words, nuance is "the joy of the lessons that cloaks the aridity of certain exercises in a resplendent mantle of poetry and beauty."¹¹

THE CLOSING

Since most Dalcroze scales do not end on tonic, they invite a musical addition that resolves the lingering harmonic tension. In its simplest form, as suggested earlier, that could mean singing the tonic note immediately after the scale. But the closing can also be an opportunity to reinforce harmonic progressions and scale degree patterns related to students' work in theory and sight singing. Equally important, the closing can give students a chance to improvise and express themselves creatively.

"Up to tonic" Closing

Following the singing of a scale (in a rhythm and meter of the teacher's choosing), students have one measure to sing from C back up the scale to tonic. They can do so in any rhythm and can repeat notes at will, but should arrive on tonic (or an artful $\hat{7} - \hat{1}$ retardation) on the final downbeat.

"Wrap it up" Closing

Following the singing of a scale, students have one measure (two, three, etc...) to improvise a melody that cadences on tonic.

¹¹ Ibid, p. 3

"Dominant-Tonic Improvisation" Closing

To reinforce the dominant-tonic relationships, and help students become more fluent at recognizing the notes of these chords in various keys, students can improvise melodic riffs on the dominant seventh for one bar, then on the tonic in the final bar. Depending on the student, improvisations can be simple or elaborate:

Example 12a: D $\flat$ Major C-to-C Scale with Improvised V7-I Closing

Students learn through trial and error which type of melodic endings will effectively (or not so effectively) establish the key.

If students struggle to solfège their improvisations, it is often because they cannot recall the notes of the chords quickly enough in that key. To help prepare for this, instead of improvising the two measures, first have students arpeggiate the V7 chord within the octave of C-to-C for one measure, and the tonic chord for a second measure, until they reach tonic descending:

Example 12b: D $\flat$ Major C-to-C Scale with Arpeggiated V7-I Closing

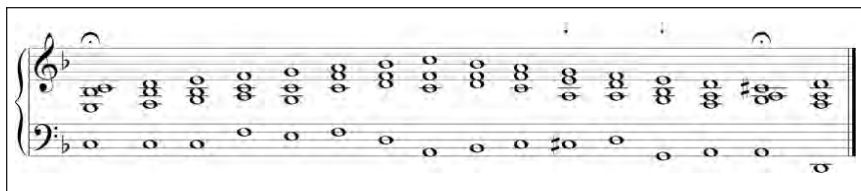
This exercise can be varied to reinforce different harmonies and complement learning from theory classes. Instead of V7-I, you might use ii $\frac{6}{5}$ -V7-I, Fr $\frac{6}{4}$ -V-I, or any other progression of your choosing.

"Fixed Pattern" Closing

Students sing a predetermined scale-degree pattern (such as $\hat{4}-\hat{3}-\hat{2}-\hat{5}-\hat{1}$) in note names or fixed-Do *within the C-to-C octave* following a scale. This exercise can reinforce scale degree patterns that are being introduced in sight singing, and helps students increase speed at translating scale degrees to pitch names. Because of the nature of the C-to-C scales, even relatively smooth patterns will result in large leaps in some keys as students leap up or down to keep the pattern within the octave of C-to-C. (Imagine, for instance, $\hat{4}-\hat{3}-\hat{2}-\hat{5}-\hat{1}$ within C# to C# in A Major.) Students generally enjoy these disjunct moments.

MODULATING C-TO-C SCALES

Once students have mastered singing and identifying C-to-C scales using the exercises above, the scales can be useful tools for teaching modulation. It is possible to harmonize a C-to-C scale in such a way that it convincingly modulates to another key. A class might be given a starting C7 chord and instructed to sing a C-to-C scale. (At this point in their studies, they should be able to quickly recognize what key they are in from a V7 prompt alone.) As they sing, this curve ball is thrown at them. See Example 13:



Example 13a: Modulating C-to-C Scale (Relative Major to Minor)

The harmonization is clear enough that, nine out of the ten times we have tried this, the class automatically sings the C# at the end of the scale. The trick is to then isolate which note feels like it is shifting into a new key. Some students will argue for the G, but most think it is the E. For a greater challenge, have the class sing the scale again, but this time only give them the starting C7 harmony followed by the closing predominant and cadential $\frac{6}{4}$ in the new key. Finally, have students sing the scale without any harmonization, encouraging them to *remember* the harmonic support at the pivot.

These sorts of harmonizations are possible for all typical modulations although they take a bit of thought to work out. Here

are several possible harmonizations of modulations to closely related keys in C-to-C scales:



Example 13b: Modulating C-to-C Scale (Tonic to Dominant)



Example 13c: Modulating C-to-C Scale (Tonic to Subdominant)

"Mid-Scale Pivots"

In another exercise, students sing a C-to-C scale up to a given note; they put a fermata on that note, at which point a new scale degree is called out. The students complete the C-to-C scale and sing the new tonic. For a more challenging version, after the fermata, the students complete the C-to-C scale silently and everyone sings the tonic together. For an even greater challenge, students sing the new tonic immediately after the fermata. As a middle step leading to this, we often have students first learn to think of any tone as scale degree $\hat{5}$ in the new key. Students sing a Dalcroze scale to a given point, and then sing " $\hat{5}\text{-}\hat{4}\text{-}\hat{3}\text{-}\hat{2}\text{-}\hat{1}$." At that moment, we give them the harmonic support of a dominant pedal, and then encourage them to hear this harmony for themselves. To test whether students are hearing the dominant, we have them arpeggiate it: " $\hat{5}\text{-}\hat{7}\text{-}\hat{2}\text{-}\hat{4}\text{-}\hat{2}\text{-}\hat{7}\text{-}\hat{5}$ " before moving on.

Pedagogical Advantages of Singing C-to-C Scales vs. Traditional Tonic-to-Tonic Scales

C-to-C scales offer a number of significant pedagogical advantages worth considering. The most obvious is that all major

and minor scales are set in a range comfortable for most students to sing. However, there are deeper, more compelling reasons for incorporating them into the traditional aural skills curriculum. Let us begin by comparing them to traditional tonic-to-tonic scales, and ask: what do C-to-C scales require of students that traditional scales do not?

First, students have to be much more aware of the accidentals needed to sing a C-to-C scale. To sing a traditional tonic-to-tonic scale, the singer need only be concerned with where the scale begins and ends. By comparison, to sing a B $\flat$ Major C-to-C scale, for example, the singer must know which accidentals are needed, in this case, B $\flat$ and E $\flat$. She cannot simply sing the tonic-to-tonic major scale transposed. When Dalcroze scales are incorporated into aural training, students learn to automatically recall the accidentals required for all keys and scales.¹²

Second, C-to-C scales bring focus to the unique half- and whole-step patterning of each major and minor scale. These scales force students to concentrate on whether they are singing a whole- or half-step. For instance, singing the A $\flat$ Major Dalcroze scale for the first time often requires enormous attention—to start a scale with a half-step is typically quite difficult for a beginner. Soon, this becomes automatic, and half- and whole-step patterns become aural clues for the student. This knowledge has vast implications for the teaching of sight singing and dictation; students need only hear a tiny fragment of a scale in a composition to know what part of the scale they are in.

Third, C-to-C scales train students to become as familiar with starting a scale from *any* scale degree as they are from tonic, which models how scales are often experienced in real music.

Fourth, C-to-C scales train students to make any pitch feel like *any* scale degree, a critical skill for students to have acquired when they begin sight singing and hearing modulating passages. In the Dalcroze approach, this ability is hardwired from the beginning. Students are cognizant of and able to adapt instantly to the functional transformations that occur among tones when moving from one key to the next.

¹² We have found that singers, whose instrument does not specifically require an awareness of note names, especially benefit from learning to think about scales in this way, and that the work can greatly improve their intonation in sight singing and performance settings.

Fifth, C-to-C scales can help strengthen the functional hearing of students with absolute pitch. In most dictation contexts students with absolute pitch can still arrive at the correct answer without necessarily hearing function. (Even in harmonic dictations, as an example, many students with absolute pitch first hear the letter name and then use their knowledge of theory to give it a functional label.) But absolute pitch is not helpful in discovering the function of C. This fact levels the playing field, challenging those with absolute pitch and often enlivening those without it. Discovering the function of C is a game in which all students can participate equally. Although Dalcroze uses a "fixed" system, the fundamental goal of his method is to teach sensitivity to functional hearing.

Finally, C-to-C scales ground students in the absolute sound of C. We have found that many students who study Dalcroze scales and other related exercises are able to find middle C by the end of the first semester.¹³ Moreover, most highly experienced Dalcroze students are able immediately to identify how C is functioning within the scale of a piece of music, and from that, know what key the piece is in.

Conclusion to C-to-C scales

Singing, ear training, and improvising within C-to-C scales develop in students an acute sense of scale degree function and tonal context. Unlike other methods that use relative systems (scale degrees or moveable-Do), Dalcroze's solfège method, by its very use of absolute systems (fixed-Do or note names), intentionally postpones labeling function. These exercises encourage students, and indeed require them, to discover function for themselves. The main goal of every C-to-C exercise is to discover, by ear, *how* C is functioning. Once students have discovered the function of C, singing the scale with functional labels (scale degree numbers or in moveable-Do) confirms and names their discovery.

¹³ We recognize that developing the ability to recall middle C is not the same as developing absolute pitch, which research suggests can only be acquired during a critical-period in childhood. For an interesting discussion on this critical-period of absolute pitch acquisition, see E. W. Marvin, "Absolute Pitch Perception and the Pedagogy of Relative Pitch," *Journal of Music Theory Pedagogy* 21 (2007): 1-37 and L. J. Trainor, "Are There Critical Periods for Musical Development?" *Developmental Psychology* 46 (2005): 262-278.

Students who study C-to-C scales over an extended period of time learn to convert note names to scale degrees automatically; a Dalcroze student hearing C in the key of B♭ major, for example, knows instantly how C *feels* in that key and knows this in terms of the note names themselves. This allows students to transfer their trained knowledge into expressive performance, adjusting their playing accordingly; for they know just *how* any note they play feels.

II. SCALAR FRAGMENT EXERCISES

While C-to-C scales make up the heart of Dalcroze's solfège approach, he devotes the second and third volumes of his *Les Gammes et Les Tonalités, Le Phrasé et Les Nuances* to the study of scalar fragments. Whereas C-to-C scales train students to grasp scales as wholes, scalar fragments invite students to explore *within* the scale. Scalar fragments train students to hear, sing, and improvise a melody starting from any place within any scale. Knowing at all times where one is positioned in a tonal context is an essential skill for any performing musician. Like C-to-C scales, fragment exercises prepare students to hear, sight-sing, and improvise modulations. Scalar fragment exercises develop:

- The ability to recognize the internal make up of any major / minor mode
- The ability to start singing from any place within a major or minor scale
- Sensitivity to the dynamic and functional difference among same-named intervals

Exercises begin with two-note fragments and continue up to fragments of seven notes. For our purposes, we focus primarily on exercises that feature *dichords* (two adjacent notes of the scale) and *trichords* (three adjacent notes of the scale). The terms dichords and trichords are, of course, not to be confused with their use in set theory. While Dalcroze's own solfège texts focus equally on smaller and larger fragments, many Dalcroze practitioners today (including the authors) work mainly with the smaller fragments of the dichord and trichord.¹⁴

¹⁴ Dalcroze refers to scalar fragments as: Dichords—two-notes; Trichords—three-notes; Tetrachords—four-notes; Pentachords—five-notes; Hexachords—six-notes; and Heptachords—seven-notes.

In the Dalcroze approach, scalar fragments are the primary means by which students learn intervals. Intervals are taught as omitted steps within the context of a scale and a key. In other words, the interval of a third is not identified as a measured gap outside the scale, but rather as a skipped step *within* the scale; a third is one skipped step; a fourth is two skipped steps, and so on.¹⁵

We believe teaching intervals as skipped steps in the scale sensitizes students to the dynamic differences inherent in each of the same-named intervals. Take, for example, the four minor thirds that reside in the major mode. Each has a unique dynamic function based on its location within the scale. For instance, when we compare the minor third composed of the leading tone and scale degree $\hat{2}$ to that of the minor third composed of scale degrees $\hat{6}$ and $\hat{1}$, the former sounds more active, even “wider” than the latter, which sounds more passive, even “smaller.” Fragment exercises sensitize students to these subtle dynamic differences among same named intervals.¹⁶

Dichords

To begin, students sing the scale in dichords (Do-Re, Re-Mi, and so on...) in an eighth note rhythm. When they come to a half-step dichord, they are to sing a triplet figure (e.g., Mi-Fa-Mi in C Major). Again, solfège can be substituted with scale degrees or letter names. For instance, in E Major:



Example 14: E Major Dalcroze Scale with Triplet Half-Steps

¹⁵ Whether the reader agrees or not with a scale-based approach to teaching intervals, this method has its merits in illuminating an interval's scalar position and can be combined with other non-scalar based approaches to teaching intervals.

¹⁶ See Karpinski's discussion, which draws together several strands of research in support of a context based approach to teaching intervals in Gary S. Karpinski, *Aural Skills Acquisition: The Development of Listening, Reading, and Performing Skills in College-Level Musicians* (New York: Oxford University Press, 2000), 52-56.

This E major scale looks like a C# minor scale; however, from the work in C-to-C scales discussed previously students have learned to internalize a harmonization that makes this scale feel as if it is in E major. The teacher can help by providing an E major harmonization as the students sing. Highlighting half-steps with a triplet helps students distinguish between half- and whole-steps and to locate their position in each scale. For an added challenge, ask students to physicalize the eighth note rhythms by patting their laps on the downbeat and clapping their hands on the off-beat as they sing—resulting in several three against two rhythmic patterns.¹⁷

Trichords

Most American Dalcroze teachers today spend more time on trichords than any other scalar fragment. Trichords are grouped into five species. The first three occur in the major and minor modes, but the last two only occur in harmonic minor. Bob Abramson assigned numbers to each of the five trichords to clarify their identification. See Example 15:

Trichord:	#1	#2	#3	#4	#5

Example 15: Trichord Species 1-5

To ensure students know the position of each trichord in the scale, ask them to indicate its species by holding up the appropriate number of fingers, or singing words such as “trichord 1,” while singing up the scale. This exercise trains students to become aware of a trichord’s placement in the major and minor scales, which helps in understanding modal differentiation.

Trichord:	1 2 3 1 1 2 3 2 1 1 3 2 1 3

Example 16: Trichords within the Major Scale

¹⁷ Dalcroze presents several rhythmic solfège exercises in his writings. We encourage teachers to invent other exercises combining pitch and rhythm.

Choose other Dalcroze scales and do the same exercise. You will notice how acutely aware you become of the half- and whole-steps patterning for each scale. Once students are fluent with their analysis, ask them to sing trichords going down the scale. Identifying trichords while singing up the scale is comparatively easy, but it takes practice to sing and identify descending trichords given the analysis of species is from low to high. We recommend singing trichords in major and natural minor scales first. After having sung Trichord Species 1, 2 and 3 for some time, the sound of Species 4 and 5 is quite distinctive.¹⁸

"Scrambled Trichords"

For a greater challenge, students sing the three notes of each trichord out of order, for instance (Mi Do Re, Fa Re Mi, and so on...). Starting the trichord from any of its three pitches furthers one's familiarity with its internal make up.

"Rhythmic Trichords"

Ask students to sing different rhythmic patterns for each trichord, such as:



Example 17: Rhythmic Trichords

This particular rhythmic pattern reinforces the location of half-steps with a longer note value on the way up. You could reverse this pattern on the way down, or appreciate the "displaced dissonance"¹⁹ you experience when quarter notes no longer line up with the half steps.

¹⁸ Identifying the species of trichords adds another layer of understanding to the sequence drills Karpinski uses to develop fluency with syllables, see Karpinski, *Aural Skills Acquisition*, 149-151.

¹⁹ Dalcroze was particularly fond of these types of exercises, and includes several games in his method that teach this sort of "dissociation."

"Coded Melodies"

Pick a C-to-C scale and sing through it to establish the key and a harmonic context. Sing a note (on letter names or fixed-Do) for students, while showing three fingers either pointing upwards or downwards. Students sing the trichord (up or down) from the note you've sung. For added challenge, do not *sing* the first note, but simply *say* its name or fixed-Do solfege. (By changing the number of fingers, you can indicate dichords, tetrachords, and so on, for a more varied melody.)

Trichords do not reveal any new or unusual information, but singing them teaches students the internal makeup of the scale, which in turn trains them to know where they are positioned at all times within a tonal context. Harmonizing trichords while students sing helps them understand the harmonic implications associated with different parts of the scale.

"Coded Melodies 2"

In another variant of this game, the number of fingers you show can instead represent the species of trichord students are to sing. This highly challenging exercise is a great way to introduce elements of chromaticism, including modulation and mixture.

"Melodic Walks"

In these exercises a melodic pattern within a scalar fragment is given, and students take it for a "walk" up or down the scale.



Example 18: An Example of a Melodic Walk (*Marche Mélodique*) in D Major

Singing these patterns makes students highly aware of the functional makeup of smaller fragments contained within the scale; in fact, the second and third volumes of *Les Gammes et Les Tonalités*, *Le Phrasé et Les Nuances* are largely devoted to this type of exercise.

Fragments of various sizes can be used, and we encourage teachers to invent their own scalar patterns for students to “walk” up and down.

“Trichord ID”

Play a trichord for students; they should immediately sing it back on words that identify it by number, such as “Trichord 1” for two whole-steps. Alternately, if you are working within a key, students can sing it back first on its trichord name (“Trichord 2”) and then sing it on scale degrees (for example “ $\hat{6}-\hat{7}-\hat{1}$ ”).

“Trichord Hunt”

Play a scalar fragment, and tell students the starting note. Once students have identified its species (e.g. species 2/ whole-half) and the note names (e.g. D-E-F) they should “hunt” for it in all the major and minor scales in which the trichord functions, and sing those C-to-C scales. For instance, D-E-F is $\hat{2}-\hat{3}-\hat{4}$ in C major, $\hat{6}-\hat{7}-\hat{1}$ in F major, $\hat{1}-\hat{2}-\hat{3}$ in D minor, and $\hat{4}-\hat{5}-\hat{6}$ in A minor. This exercise is an excellent precursor to teaching modulation.

III. IMPROVISING HARMONIC PROOFS

Dalcroze taught modulation as a change of scale, and believed that if students could immediately swap between any two scales, they could handle all modulations. Harmonic proof improvisations develop the ability to:

- Establish a tonal context for oneself
- Sing and hear a modulation to any major or minor key
- Interpret all possible pivots of any set of notes
- Hear associations between recently heard melodic pitches and those recalled from earlier

The exercises that follow are largely drawn from the teaching of Anne Farber, and are clearly an extension of Dalcroze Scales.

Proving Tunes

Once students have gained experience singing and identifying trichords, they are ready for a more advanced game called Proving Tunes, which teaches the processes of modulation. Proving tunes require students to improvise melodies from a given trichord that ultimately must end in a key that proves the assigned function of the opening trichord. From this activity, students learn how the same trichord can serve as a “pivotal gateway” into all its possible keys.²⁰

To play the game, ask a student to sing (on solfège or letter names) a given trichord that starts on any pitch. For instance, the student could sing a species 2 trichord on Re-Mi-Fa (D-E-F). Assign one of the four possible scale-degree functions to the trichord: $\hat{2}-\hat{3}-\hat{4}$, $\hat{6}-\hat{7}-\hat{1}$, $\hat{1}-\hat{2}-\hat{3}$, or $\hat{4}-\hat{5}-\hat{6}$.

Ask the student to improvise a melody that ends on the “tonic” that will prove the function of the opening trichord. For instance, if Re-Mi-Fa is assigned to scale degrees $\hat{4}-\hat{5}-\hat{6}$, the student needs to improvise a melody that convincingly ends in the key of A minor. See Example 19b:

a: Species 2 Trichord as $\hat{2}-\hat{3}-\hat{4}$ in C Major



b: Species 2 Trichord as $\hat{4}-\hat{5}-\hat{6}$ in A Minor



c: Species 2 Trichord as $\hat{6}-\hat{7}-\hat{1}$ in F Major



d: Species 2 Trichord as $\hat{1}-\hat{2}-\hat{3}$ in D Minor



Example 19 a-d: Possible Proving Tunes for Trichord #2 on D

²⁰ We recognize that our game, “Proving Tunes” is a more elaborate version of the game, “One-Note Wonder,” presented in Deborah Rifkin and Diane Urista’s article, “Developing Aural Skills: It’s Not Just a Game,” 57-78.

Improvising Proving Tunes trains students:

- to determine ahead of time the tonic and function of the opening trichord, such as D-E-F as $\hat{4}\text{-}\hat{5}\text{-}\hat{6}$ in A minor.
- to insert the required accidental(s), such as a leading tone G $\sharp$ in A minor, which places a half-step between sol and la.
- to improvise a melody with enough key-defining properties to transform the opening trichord into its prescribed function.

Through the act of improvisational trial-and-error students learn the combination of musical elements (time / rhythm / pitch patterns) required to create a convincing key-defining melody, an activity that trains students to establish a tonal context for themselves. This game also helps develop the memory of non-adjacent pitch associations. Upon reaching the final tonic, the student has to have mentally retained the sound of the opening pitches to assure that they have been converted into their prescribed function. After the student finishes singing her melody, the rest of the class could sing it back. The teacher could harmonize the melody to solidify harmonic hearing (dominant and tonic chords often suffice).

Students can take turns improvising proving tunes from the same D-E-F trichord with the remaining functions, respectively, $\hat{2}\text{-}\hat{3}\text{-}\hat{4}$, $\hat{6}\text{-}\hat{7}\text{-}\hat{1}$, and $\hat{1}\text{-}\hat{2}\text{-}\hat{3}$ (refer back to Examples 19a-d). Improvising proving tunes teaches *pivotal fluency*: the ability to interpret instantly all possible pivots inherent in a given set of notes—an essential skill for becoming fluent in identifying and singing a modulation into any key.

Once students have mastered improvising melodies into different keys, they can take turns singing one continuous modulating melody that moves into several keys using the trichord as a pivotal gateway into each new key. This exercise is especially useful in teaching musical passages that contain rapidly changing tonal contexts, as in the case of development sections or late Romantic works.

A student or teacher can also improvise a proving tune as a C-to-C scale *prompt*. First play a trichord from C. Then improvise (or have a student improvise) a proving tune using that trichord. Once students determine how C is functioning, they should hold up that number of fingers. Following the tune, all students sing the C-to-C scale that has been “proven.”

Proving Tunes train students to seek out tonal cues as the melody unfolds, which helps them to verify the assigned function of the opening trichord. Increase the speed at which you play each new melody; the goal is for students to recognize instantly the key and

assigned function of the opening trichord. Or students can take turns improvising melodies beginning with Do-Re-Mi using all possible functions and keys for the class to identify. This activity engages the entire class in the improvisatory and ear training process.

Paths to C

In *Paths to C*, students improvise melodies from any given starting pitch that must end on C. The object is to create a melody that clarifies the final function of C as a scale degree in the chosen key. For instance, if F# is given as the starting pitch, one possible path from F# to C is in G minor. The improvised melody must convince the listener that the final C is scale degree $\hat{4}$, an unstable tone in the key of G minor. See Example 20a.

a. Path from F# to C in the key of G minor; C is scale degree $\hat{4}$



b. Path from F# to C in the key of E minor; C is scale degree $\hat{6}$



c. Path from F# to C, modulating from G Major to C Major; the final C is scale degree $\hat{1}$



Example 20 a-c: Paths to C

Alternatively, the student could improvise a path from F# to C in the key of E minor, in which case C is confirmed as scale degree $\hat{6}$. See example 20b. A longer modulatory path could take place from F# to C that begins in G major, but then modulates to C major, which confirms the final C as scale degree $\hat{1}$. See Example 20c. In advanced classes, students might also treat the starting note as a non-diatonic tone, freeing them to make C take on any scale degree function. *Paths-to-C* is a more advanced improvisatory exercise than *Proving Tunes*, in that students have to finesse a melody on-the-spot that converts the final C into a variety of different scale degrees.

CONCLUSION

In closing, we have found Dalcroze's exercises and games particularly useful in the first and second semesters of a traditional aural skills curriculum. When practiced over time, Dalcroze's approach to solfège and ear training greatly improves students' sensitivity to function and the harmonic meaning of tones. C-to-C scales are particularly beneficial for students who struggle with intonation or tend to "drift" from the key; the Dalcroze method makes it almost impossible for a student to accidentally sing a note outside the tonal context they are working in. The exercises are designed in the spirit of exploration, and help cultivate an engaging classroom dynamic. They require no special materials and can be used in the context of any aural skills curriculum. They can be endlessly varied, and we encourage teachers to invent exercises and games of their own following the principles of Dalcroze's method.

**SUMMARY OF
DALCROZE SOLFÈGE AND EAR TRAINING
PEDAGOGICAL BENEFITS**

I. C-to-C Scales develop:

- Sensitivity to scale degree function and functional transformation/modulation
- The ability to conceive of any tone as any scale degree function
- An acute awareness of whole- and half-step patterns for all keys
- Knowledge of one's position within a tonal context at all times
- A strong memory for C, and the ability to identify the key of a musical passage based on the function of C within the passage

II. Scalar Fragment Exercises develop:

- The ability to recognize the internal make up of any major/minor mode
- The ability to start singing from any place within a major or minor scale
- Sensitivity to the dynamic and functional difference among same-named intervals

III. Harmonic Proof Improvisations develop the ability to:

- Establish a tonal context for oneself
- Sing and hear a modulation to any major or minor key
- Interpret all possible pivots of any set of notes
- Hear associations between recently heard pitches and those recalled from earlier in a melody

APPENDIX A

AN ANNOTATED BIBLIOGRAPHY OF SELECT SOURCES ON DALCROZE EURHYTHMICS

Abramson, Robert M. "The Approaches of Emile Jaques-Dalcroze." In *Teaching Music in the Twentieth Century*. New Jersey: Prentice Hall, 1986.

An overview of Dalcroze's movement-to-music educational philosophy and approach for teaching rhythm, solfège, solfège-rythmique and improvisation to children in the classroom; some ideas are adaptable to the undergraduate music major.

———. *Feel It! Rhythm Games for All*. Warner Bros. Publications, 1998 and *Rhythm Games for Perception and Cognition* (Revised edition). New York: Volkwein Bros., 1997.

Both sources present a series of basic movement exercises and games for teaching rhythm to children that can be made more challenging for the undergraduate music major.

Abramson, Robert M. and Joseph Reiser. *Music as a Second Language*. New York: Music & Movement Press, 1994.

Numerous exercises and games for teaching basic ear-training, sight singing, dictation, and expressive performance through movement for children; many exercises are adaptable for a college-level fundamentals course.

Alperson, Ruth. "A Qualitative study of Dalcroze Eurhythmics Classes for Adults," PhD diss., New York University, 1995.

Detailed summaries of four eurhythmics classes for adults that demonstrate teaching various rhythmic subjects, phrase, and form through movement, followed by an interesting discussion on the pedagogical principles and benefits.

Bachmann, Marie-Laure. *Dalcroze Today: An Education through and into Music*. Translated by David Parlett. Edited by Ruth Stewart. New York: Oxford University Press, 1991.

An in depth study of Dalcroze's educational philosophy and practical ideas for teaching rhythm, pitch, and improvisation through movement for children; many of the ideas presented are appropriate for teaching adults.

Caldwell, J. Timothy. *Expressive Singing: Dalcroze Eurhythmics for Voice*. New Jersey: Prentice Hall, 1995.

A thoughtful overview of Dalcroze's philosophy, including introductory exercises for teaching eurhythmics, improvisation, and melody to the college level student with an introduction to Dalcroze's rules of nuance, phrasing, and accentuation to enhance expressive performance with an emphasis on the singer but applicable to any musician.

Findlay, Elsa. *Rhythm and Movement; Applications of Dalcroze Eurhythmics*. Evanston, Ill.: Summy-Birchard Co., 1971.

Imaginative movement activities, games, and music for teaching rhythm, pitch, and form to young children.

Graybill, Roger. "Towards a Pedagogy of Gestural Rhythm." *Journal of Music Theory Pedagogy* 4/1 (1990): 1-50.

A study on "gestural rhythm" and the benefits of integrating basic eurhythmics exercises into the college level aural skills classroom for teaching simple rhythmic patterns, meter, and melodic contour.

Jaques-Dalcroze. *Eurhythmics, Art and Education*. Translated by Fredrick Rothwell. Edited by Cynthia Cox. New York: A.S. Barnes and Co, 1930 and *Rhythm, Music, and Education*. Translated by Harold F. Rubenstein. 1921. Reprint, New York: G. P. Putnam's Sons, 1931.

Both sources by Dalcroze present in depth essays about his movement-to-music philosophy and pedagogical purpose for an education in eurhythmics for the child, dancer, composer, and actor; the principles of rhythmic movement, solfège, improvisation, and *plastique animée* are addressed.

———. *Exercices Pratiques d'Intonation*. Lausanne: Jobin et Cie, 1894.

Dalcroze's first publication of the C-to-C scales, including a brief preface enumerating what he saw as the primary benefits of this approach. This slender 41-page volume presents the scales and a variety of rhythmic patterns (some with French lyrics) for practicing the scales.

———. *Les Gammes et les Tonalités, le Phrasé et les Nuances*, in three volumes. Lausanne: Jobin et Cie, 1906.

Dalcroze's most comprehensive solfège manuals, in which he introduces his pedagogy of do-to-do scales, scalar fragments, and preliminary exercises for modulation.

- . *Music Movement and Ear-Training: Games and Exercises*. Translated by The Dalcroze School, London. Switzerland: Charles Huguenin, 1939.

A compilation of basic exercises and games by Dalcroze for teaching ear training, singing, and rhythmic movement, which are applicable for any level or age.

- . *Préparations pour une méthode de Solfège Rythmique Vocal*. Luasanne: Jobin et Cie, 1925.

Exercises and games by Dalcroze that teach pitch and rhythm movement concurrently. Musical subjects include melodic ornamentation, changing meter, polyrhythms, and unequal beats. Appropriate for any age or level.

- . *The Jaques-Dalcroze Method of Eurhythmics: Rhythmic Movement*. London: Novello and Co., 1920.

An analysis of the movement techniques and physical considerations (such as proper carriage, length of steps, etc.) for performing eurhythmics, and a collection of exercises for walking rhythms and beating time in duple, triple, quadruple, and quintuple meters. Diagrams of Dalcroze's full-body conducting patterns are included.

- Moore, Stephen Fred; Julia Schnebly-Black. *Rhythm Inside: One-on-One*. Van Nuys: Alfred Press Inc., 2004.

A compilation of eurhythmics exercises tailored for the private studio appropriate for adults and children.

- Pennington, Jo. *The Importance of Being Rhythmic*. New York: G. P. Putnam's Sons, 1925.

An overview of the principles of eurhythmics and an introduction to basic movement exercises addressed to children but appropriate for any age or level. The book is based on and adapted from "Rhythm, Music and Education," by Dalcroze.

- Rosenstrauch, Henrietta. *Essays on Rhythm, Music, Movement*. Pittsburgh: Volkwein Bros., Inc., 1973.

Interesting essays from a student of Dalcroze on his pedagogical philosophy and the study of rhythm and movement in general; the practical ideas are for teaching children but applicable to any age or level.

Schnebly-Black, Julia and Stephen F. Moore. *The Rhythm Inside – Connecting Body, Mind and Spirit Through Music*. Oregon: Rudra Press, 1997.

A worthwhile discussion on the many pedagogical benefits of eurhythmics, and fourteen basic exercises applicable for any age or level. Includes a CD with accompaniments for movement and exercise directives.

Spector, Irwin. *Rhythm and Life: The Work of Emile Jaques-Dalcroze*. Dance and Music Series No. 3. Stuyvesant, NY: Pendragon Press, 1990.

A thorough study of the historical development of Dalcroze's eurhythmics approach, his influences and pedagogical principles. It also includes practical movement exercises suitable for any age or level.

Steinitz, Toni. *Teaching Music in Rhythmic Lessons: Theory and Practice of the Dalcroze Method*. Edited by Rafi and Bruno Reinhardt. Tel-Aviv: Or-Tav Music Publications, 1988.

A compilation of practical Dalcroze eurhythmics exercises for teaching specific rhythmic subjects, such as, syncopation, cross rhythms, pathetic accents, etc. appropriate for any age or level.

Stevenson, John Robert. *Pursuing a Jaques-Dalcroze Education – Solfège Volume I*. Edited by Arthur E. Oestrander. iBooks, 2013.

A Dalcrozian approach to teaching solfège, sight singing, rhythm, and improvisation that is appropriate for the undergraduate music major or advanced high school student. (Volumes II and III are expected shortly.) Includes numerous music examples and audio files.

Urista, Diane J. "Beyond Words: The Moving Body as a Tool for Musical Understanding." *Music Theory Online* 9 (August 2003).

Eurhythmics inspired movement-to-music exercises and games for teaching rhythm, cadence, and form to the undergraduate music major that includes classroom video demonstrations.

APPENDIX B

SUGGESTIONS FOR TEACHING C-TO-C SCALES IN A MOVEABLE-DO CONTEXT

In my work at DePauw and Interlochen, where moveable-Do (with Do minor) is the institution-wide approach, I've had the chance to see the benefit that these exercises bring to students trained in moveable-Do. Here are some suggestions for teaching C-to-C scales within this context. -Gregory Ristow

1. When starting the C-to-C scales, start with moveable-Do first. Use all the prompts given in the article, but instead of singing letter names, first have the students identify the solfège of the starting C. Students from a moveable-Do background will often find that calling C by its moveable-Do solfege (for instance "mi") will bring to mind the rest of the key and help them sing the correct half-and-whole steps.

2. Once students have sung a scale well in moveable-Do, have them sing it on letter names. Especially in the early stages, pick a slow enough tempo for students to also sing the accidentals. Students find this very challenging at first, and it can really reveal how little students trained exclusively in a moveable solfège system are aware of the actual notes that they are singing.

3. Challenge students to show the Curwen/Kodály hand signs (if you use them) or to hold up fingers for scale degrees as they sing on letter names. This helps students learn to think about both pitch and function at the same time, and helps students connect the new world of pitch naming to their known world of functional solfège.

4. The reverse is also possible: When students sing on moveable-Do, consider having them use one hand as a staff (five fingers = five lines; imagine a treble, bass or C-clef) and point to the note they are singing with their other hand.

5. When giving a prompt for a C-to-C scale, have students name the key (in addition to, or instead of the solfège / scale-degree) before singing the scale. They can do this verbally, or they could show the number of sharps or flats in the key by pointing that number of fingers up or down. (e.g., point 3 fingers up for A Major, 6 fingers down for G $\flat$ Major.)

6. As students gain mastery of singing the C-to-C scales, use a signal to have them change mid-exercise between moveable-Do solfège and letter names. For instance, "Let's sing a B $\flat$ major scale from C. When I snap, switch between solfège and letter names. Let's start on solfège."

With these very few modifications, I have found that all of the Dalcroze exercises we've described work very well in a moveable-Do context.

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