a journal of the Society for Music Theory

Volume 9, Number 2, July 2003

Post-Tonal Improvisation in the Aural Skills Classroom

Peter Silberman

KEYWORDS: ear training, pedagogy, twentieth-century music, post-tonal music, improvisation

ABSTRACT: This paper presents an improvisation-based approach for teaching students to hear and understand aspects of twentieth-century music. The improvisation exercises are based on concepts taken from eight commonly used twentieth-century music textbooks. The paper ends with analyses of improvisations created by two undergraduates who were trained in the author's method. Recordings and transcriptions of these improvisations are included.

Received April 2003

---

[1] Post-tonal music is often a foreign language to undergraduates. In particular, students frequently have difficulty in mastering sight-singing and dictation of atonal materials due to their unfamiliarity. Thus, one of the goals of a course in atonal ear training is to familiarize students with pitch collections and rhythms that might be encountered in twentieth-century compositions. An effective way to accomplish this goal is to teach students to improvise using atonal materials, so that students can get simultaneous experience as both post-tonal performers and composers. Student improvisers must make decisions about how to use twentieth-century musical materials, and as a result students gain greater understanding of how twentieth-century composers constructed their music.

[2] Further, the National Association of Schools of Music has recently added improvisation to its guidelines for degrees in music. Its most recent handbook, in a section entitled "Competencies Common to All Professional Baccalaureate Degrees in Music and to All Undergraduate Degrees Leading to Teacher Certification", suggests that students should acquire the following skills during their undergraduate education:

> 1. Rudimentary capacity to create derivative or original music both extemporaneously and in written form.
> 2. The ability to compose, improvise, or both at a basic level in one or more musical languages, for example, the imitation of various musical styles, improvisation on pre-existing materials, the creation of original compositions, experimentation with various sound sources, and manipulating the common elements in non-traditional ways.[(1)]

Incorporating improvisation across the curriculum in order to teach students to improvise "in one or more musical languages", and to "[imitate] various musical styles", entails teaching not only tonal improvisation and jazz improvisation, but post-tonal improvisation as well. This article will suggest methods for doing so, and will situate improvisation in the aural skills classroom so that students can work on improvisation while improving their ears and their understanding of post-tonal music and compositional techniques.

[3] Why improvisation? The real-time nature of improvisation, in contrast to composition, is a challenge for many students. However, students benefit from real-time work in the long run, because they must master the materials and techniques under study to such an extent that they are available at a moment's notice. Steve Larson, in an article that discusses methods for using improvisation in teaching about common-practice tonality, writes "knowing facts about music . . . is only useful if those facts can be brought to bear as quickly as the musical situation . . . requires. Improvisation not only requires that those skills be accessible, but also makes them available."[(2)]

[4] Kate Covington makes the case for improvisation in aural training as follows: "Improvisation involves active learning, or learning by doing . . . By necessity, improvisation occurs in 'real-world' contexts which possess more similarities to career activities and professional needs than sitting at a desk and responding with paper and pencil."[(3)] She goes on to elaborate on the real-world nature of improvisation as opposed to more conventional classroom activities: "A . . . problem with traditional aural pedagogy is that it primarily addresses aspects of pitch and rhythm, to the virtual exclusion of other music parameters, such as texture, timbre, dynamics, and articulation. Improvisation . . . demands that the practitioner consider and integrate these other dimensions into existing and developing concepts of pitch and rhythm."[(4)]

[5] There have been few cognition experiments that involve improvisation, but one study conducted in Hungary in the 1970s does suggest that improvisation can be a good test of performers' understanding of musical structure.[(5)] Researchers Maria Sagi and Ivan Vitanyi asked non-musicians to perform several tasks, including improvising melodies over chord progressions and improvising continuations of melodic fragments. They found that the non-musicians were good at improvising when the given chord progressions or melodic fragments were familiar. Subjects were best at improvising melodies over common practice chord progressions and over modal chord progressions found in Hungarian folk music, and were best at continuing melodic fragments that were diatonic or pentatonic. Chromatic harmonies and melodic fragments made of synthetic scales gave the subjects much more trouble. Sagi and Vitanyi concluded that people can improvise only with materials that they understand. This conclusion has important ramifications for using improvisation to teach post-tonal music. It suggests that once students have learned to improvise successfully with post-tonal materials, they have internalized a sort of post-tonal style, and made that style a part of their musical vocabulary. Hence, they are a step closer to understanding post-tonal music.

[6] Teaching post-tonal improvisation, and then using it in a music theory or aural skills class, can be difficult. There are comparatively few method books in post-tonal improvisation, and no established pedagogy. In contrast, there are probably hundreds, if not thousands, of method books on tonal improvisation, mostly jazz, with a smaller selection of works in the "classical" music tradition for organists and continuo players. There are even a few tonal improvisation books and articles written for use in the music theory curriculum, such as Wittlich and Martin's *Tonal Harmony for the Keyboard,* Berkowitz's *Improvisation Through Keyboard Harmony,* and the Larson and Covington articles cited above.[(6)] Tonal improvisation is easily adapted for use in classroom settings. Tonal music has clearly defined rules and a well-established syntax, and wrong notes stick out like sore thumbs, allowing improvisations to be evaluated relatively easily.

[7] Post-tonal improvisation is quite different. How can one teach and then evaluate what seems to be an "anything goes" style of improvisation, without pre-established chord progressions, melodies, or forms? **Example 1** shows an analysis, based on analyses by Steven Block and Tom Darter, of a brief section of an improvisation by Cecil Taylor, which will suggest some answers to this question.[(7)] [(8)] This passage is from an improvisation entitled "Air Above Mountains (Buildings Within)", and is from the CD *Air Above Mountains.*[(9)] Taylor juxtaposes three types of collections of notes — chromatic, represented by set classes [0123] and [01234], whole tone, represented by set classes [026], [0248], and [02468], and diatonic, represented by set class [027]. Taylor usually plays the same pitch classes when each collection returns. Further, this whole passage can be considered to be a giant expansion of the initial chromatic motive, containing pitch classes C♯, D, D♯, and E, labeled "X". "X" reappears twice, but more significantly comprises the upper and lower bounds of later collections, which have E or D♯ as highest notes, and D or C♯ as lowest notes, as shown by the stems with flags. The one exception, the high F at the end of the second system, may be a finger slip, as there is an E directly below it.

[8] Taylor's improvisation suggests three strategies for structuring a post-tonal improvisation, each suitable for classroom use — intervals (in this case the progression from half steps to whole steps to perfect fifths), pitch class sets (in this case the juxtaposition of chromatic sets with whole tone and quintal harmonies), and scales (in this case the use of chromatic, whole tone, and diatonic scales as sources from which pitches can be selected). These topics are shown below in a brief survey of pitch-related subjects presented in post-tonal music theory textbooks.[(10)] Each listing of these topics is preceded by an asterisk.

Introduction to Post-Tonal Theory by Joseph Straus

- *Intervals
- *Pitch-class sets
- *Referential collections [scales]
- Serialism
- Operations (T, I) and other relationships (complement, invariance)

Materials and Techniques of Twentieth-Century Music by Stefan Kostka

- *Chords and simultaneities
- *Scale formations
- Serialism
- Melody and voice-leading
- Harmonic progression and tonality

Theories and Analyses of Twentieth-Century Music by J. Kent Williams

- *Intervals
- *Set types
- *Scales (in several chapters)
- Serialism
- Operations (T, I) and other relationships (symmetry)
- Neotonality
- Minimalism

[9] Joseph Straus's text has chapters on intervals, pitch-class sets, and referential collections (in other words, scales). Stefan Kostka's text also has chapters on pitch class sets, which he calls "chords and simultaneities," and scales. Kent Williams's text has sections on intervals and set types (in other words, pitch class sets), and covers scales in a variety of different chapters.

[10] The above list demonstrates that these topics are commonly presented in textbooks. These textbooks could be used as supplementary material for a course unit on post-tonal improvisation. Likewise, improvisations built on intervals, pitch class sets, and/or scales, could easily be introduced in a course using any of the above texts. The same pitch-related topics appear in three sight-singing and ear training texts that deal with twentieth-century music, shown below.(11) Again, these textbooks could be used to supplement instruction in improvisation, or improvisation could be introduced in a course using any of these books.

Modus Novus by Lars Edlund

- *Sight-singing melodies by interval content
- *Hearing chords by interval content

Sight-Singing: Pitch, Interval, Rhythm by Samuel Adler

- *Sight-singing melodies by interval content
- *Hearing chords by interval content
- *Scales

Ear Training for Twentieth-Century Music by Michael Friedmann

- *Dyads [intervals]
- *Chords
- Processes (T, I, R, invariance, contour relations)

[11] Both the Edlund and Adler texts teach students to sightsing melodies by interval content, and are organized accordingly — melodies made up of seconds are introduced first, then melodies made up of thirds, then fourths, etc. These books do the same thing with pitch class sets, introducing pitch class sets made of seconds, then thirds, then fourths, etc. The Friedmann text, which is more of an aural analysis book than a sightsinging book, first has listening exercises comprised of intervals, then proceeds to pitch class sets. The Adler text alone has a section on singing twentieth-century scales.

[12] Intervals, pitch class sets, and scales have three things in common that make them good building blocks for student improvisations. 1. They're easy to remember, at least compared to, say, remembering a 12-tone row. Thus, they're easily repeated, so that, for example, an improvisation could be structured around one chord or one interval. 2. They are static — it's easier at first to improvise with things instead of with processes. 3. They lend themselves well to transposition and inversion, two important operations that students will encounter throughout their music theory education. In contrast, a difficult improvisation might be to improvise a serial composition using 12-tone rows, which meets only one of these three requirements, that of transposition and inversion. Surprisingly, there is a book by Meyer Kupferman called *Atonal Jazz* that presents a method for learning to play 12-tone jazz improvisations.[(12)] An improvisation of that nature would be beyond the abilities of most performers without extensive study.

[13] Ed Sarath, in an article in the *Journal of Music Theory,* gives some cognitive justification for the use of small building blocks in improvisation, as opposed to global processes. Sarath distinguishes between two types of time, one experienced by an improviser, and one experienced by a composer. Sarath writes ". . .the improviser experiences time in an inner-directed, or 'vertical' manner, where the present is heightened and the past and future are perceptually subordinated. I contrast inner-directed conception with the 'expanding' temporality of the composer, where temporal projection may be conceived from any moment in a work to past and future time coordinates."[(13)] Since the improviser focuses on the present, any longer-range structure will be difficult to put into effect, and thus smaller events are a better match with the improvisational process.

[14] So far, criteria for selecting pitch materials only have been discussed. What about rhythm and meter? I've found that, especially in the beginning, it's all that students can do to master the pitch dimension of improvisation. Therefore, I start off by allowing them to perform improvisations without a pulse or meter, and without rhythmic requirements. I gradually introduce pulse into their improvisation assignments, and eventually meter. Jeff Pressing, in an article in *Music Perception,* concludes that the use of a pulse causes improvisations to be more motivically unified than improvisations without a pulse.[(14)] This has also been my experience, and since I want students to work with intervallic, pitch class set, and rhythmic motives, I make sure to require a pulse as my students become more comfortable with improvisation.

[15] In selecting rhythmic material, I try to stick to the first two of my requirements for improvisation building blocks — a building block should be easy to remember, and a thing instead of a process. Topics presented in three rhythm textbooks that have sections on twentieth-century rhythm and meter are shown below.[(15)] Topics that appear in all three books are preceded by asterisks.

Studying Rhythm by Anne Hall

- *Changing meters
- *Meters with unequal beats
- Quintuple meter
- Quintuplets
- Metric modulation
- Cross rhythms (2 against 3, 3 against 4)

Sight-Singing: Pitch, Interval, Rhythm by Samuel Adler

- *Changing meters
- *Meters with unequal beats
- Quintuple meter
- Irregular subdivisions (quintuplets, septuplets)
- Septuple meter

Rhythm Reading by Daniel Kazez

- *Changing meters
- *Meters with unequal beats
- Metric modulation
- Polymeter
- Ametric music

[16] The topics common to all three books are changing meters and meters with unequal beats. One of them meets these criteria — meters with unequal beats — and the other, changing meters, doesn't. Short rhythmic figures or motives, for example quintuplets or cross rhythms, also make good subjects for improvisation.

[17] As just discussed, one option in teaching improvisation is to start with pitch and add rhythm later. Another option is to do the opposite and have students start improvising using rhythm alone, without pitch, and then gradually add pitch elements.

[18] How does one start students improvising? Many students already have experience with improvisation, particularly those who have a background in jazz, rock, or folk music, or in composition. Also, some students have improvised with tonal materials in aural skills and/or music theory classes, which is an excellent preparation for later work with post-tonal materials. However, many students have never improvised, and may feel uncomfortable with improvisation.(16) Sample beginning exercises are shown below. Some are my own, some are by others, and all gently ease students into improvisation, without expecting much from them at the beginning. What all these exercises have in common is that it is impossible for people performing them to play wrong notes. This is important because many students' resistance to improvisation comes from stage fright — fear of playing a wrong note, fear of the audience not liking them, etc. — so I start with activities in which it is impossible to sound like a virtuoso, and there is little risk of failure.

- One note (W.A. Mathieu) - Performers sit in a circle. One person starts by playing only one note of any pitch, duration, and volume. The next person does the same, as does the next, and single notes go around the circle to form a melody.
- Two notes - Same as One Note, but performers now play an interval.
- Ten notes - Same as One Note, but now performers must play 10 notes, no more, no less. Can each make his or her own melody? Can each respond to the melody that precedes his or hers?
- Ostinato exercise (David Darling) - Performers sit in a circle. One person starts by playing an ostinato (pitch and rhythm). The next person joins with another ostinato that fits with the first one. When the third person enters, the first person drops out. The ostinato duet goes around the circle.
- Playing contours (Roger Dean) - Performer(s) play an improvisation based on shape. The shape can be realized as a pitch, a rhythm, or anything else (dynamics, register, density, etc.).
- Repeated rhythmic motive (David Darling) - Play any pitches using a repeated rhythmic ostinato — can be Baroque dance figure, for example (sarabande, etc.).
- Playing your name (John Buccheri) - Performers each play a musical fragment that matches the rhythm and inflection of his or her name.(17)

[19] I'll describe a couple of these exercises in more detail. I always start with "One Note", an exercise developed by the pianist W.A. Mathieu. Students sit in a circle. One person starts by playing or singing just one note of any pitch, length, and volume. The person seated next to him or her then also plays just one note, again of any pitch, length, and volume. The person seated next to that person does the same thing, and in this fashion notes travel around and around the circle. Eventually some sort of melody emerges, and students start thinking and experimenting with ideas of continuation and interruption. We then proceed to "Two Notes", which works the same way, except that participants can play or sing just two notes. This gets students to think about intervals — which are easy or hard to sing or play, which sound or don't sound good to them, which go together, which don't, etc.

[20] Further, it's important for instructors to demonstrate improvisation exercises first, so that students can hear a possible result for each exercise. This also helps "break the ice," particularly in situations in which improvisation is new for students. Thus, any instructor incorporating improvisation into his or her classroom should improvise regularly, both in the practice room and in front of students. Instructors with limited experience in improvisation can benefit by working through the exercises in the books listed in footnote 17 above.

[21] I'll now describe how I implemented the foregoing ideas. During the fall semester of 1999, I taught an advanced atonal aural skills course at Oberlin Conservatory. Most of the students in the course were performance majors, with a few music education or composition majors, and most were juniors. This course was not required of all students at Oberlin, only those who had passed a placement exam and had been exempted from taking earlier aural skills classes. As a result, students in this course had above-average skills. I do, however, believe that the methods described in this article would work well with other student populations.

[22] Improvisation was introduced after fall break, the first half of the semester having been devoted to more conventional activities. Students were presented with five improvisation exercises of increasing difficulty at a rate of one a week. The first improvisation exercise, which was assigned for homework, is shown below.

Form: ABA'
Length: 30 seconds to one minute
Directions: The A and A' sections use this contour 21043. The B section uses its inversion, 23401
Contour can represent anything - notes, motives, phrases, durations, dynamics, register, etc.

[23] This exercise is designed to give students a taste of improvisation without demanding too much of them. The improvisation has a form — ABA — and a length — 30 seconds to one minute. Students were asked to improvise using one contour only, and the sections differ in that the middle section uses the inversion of the contour. The contour can represent anything — pitches, rhythms, dynamics, etc. — so that the assignment becomes very flexible. Some students are more comfortable with rhythm than with pitch, or with other parameters entirely, and for the first assignment I wanted them to be comfortable. Students could sing, perform on their main instrument, or play the piano if piano was not their main instrument. As a homework assignment, they were asked to improvise a short work every day for a week, following these directions. They were not allowed to write anything down, or to memorize anything other than the directions, so this assignment did not turn into a notated or memorized composition. After a week of practice, I selected several students in class to perform for a grade. I won't say much about grading, except that I based my grade primarily on whether or not the students could follow the directions and do everything I asked of them in their improvisations.

[24] The next improvisation exercise, which is more specific in terms of pitch content, is shown below.

Form: ABA'
Length: 30 seconds to one minute
Directions: The A section should consist primarily (but not exclusively) of a trichord and its transpositions. Choose from 013, 014, 015, 016, 025, 026. You can use this trichord as a harmony, as a melody, or as both. You may also use intervals from that trichord, or larger chords or melodies that contain it. The B section should consist primarily of another trichord. Use any except what you used in the A section and 037. The A' section should be a variation of the A section, except that the trichord used in the A section should be used here in inversion.
Listeners: must identify each trichord used by the performer.

[25] Form and length are the same as exercise one, but now the students were required to base their pitch structure on trichords. Students were provided with a list of trichords from which to choose for the A section. Students could use the trichords as verticalities if they played a chordal instrument, or as melodies or motives if they did not, and could transpose them to as many pitch levels as they would like. In order to have more flexibility, students were allowed to use intervals from the trichords, or larger chords or melodies of which their trichord was a subset. Students were asked to use a different trichord for the B section. The A' section used the same trichord as the A section but in inversion. Note that in this exercise, as in all the succeeding ones, there is an assignment for the listeners, who must identify the trichords used by the performer in each section.

[26] The third improvisation exercise is shown below.

Form: Variation form (A A' A'')
Length: 30 seconds to one minute
Directions: Consider the following relationships: contrast, complementation, conflict. Choose two trichords and improvise a piece of music that uses them in one of the relationships. One of the trichords must be in inversion. Your relationship between the trichords should stay the same in each variation.
Listeners: must identify the two trichords, and the relationship.

[27] Like the second exercise, the third exercise uses trichords but has a new form — variation form — and also has directions for narrative content. I wanted students to start thinking more about the emotional or narrative aspect of their improvisations. They were asked to select a relationship and illustrate it with two trichords. The relationships were contrast, complementation, and conflict. I hoped that this would make students think about things such as which trichords sounded good together, which didn't sound good together, and which might be related and why. Again, the listeners were asked to identify the trichords, and also the relationship.

[28] The fourth improvisation exercise is shown below.

Form: binary (AB)
Length: 30 seconds to one minute
Directions: The A section should use any trichord except 037 and should have a steady tempo and a consistent meter. You will then abruptly switch to the B section, which should have a tempo relationship with the A section of either 1:2, 2:1, 2:3, or 3:2. The B section should use any of the tetrachords we've studied in class (0123, 0246, 0158, 0369, 0258, 0358, or 0148).
Listeners: must identify the trichord, the tetrachord, and the tempo relationship.

[29] Here metric requirements were introduced. The improvisation was required to have a steady pulse, and was in two sections whose tempos were related by the tempo proportions we had studied and performed in class. The first section was based on a trichord, and the second on a tetrachord. Listeners were asked to identify the trichord and tetrachord used, and the relationship between the two tempos.

[30] The fifth and final improvisation exercise is shown below.

Form: ABA'
Length: 30 seconds to one minute
Directions: The A section will use any tetrachord from this list: 0257, 0347, 0237, 0167, 0268, 0134, 0235. The B section will use any tetrachord from this list: 0123, 0147, 0158, 0258, 0358, 0369. The A' section will use another trichord from the A section list. Both the A and A' sections will use accents in unusual places in the manner of Ruth Crawford Seeger's *Piano Study in Mixed Accents.*
Listeners: must identify the tetrachords used.

[31] Like the second improvisation exercise, the fifth improvisation exercise is also in ternary form, with the B section using a pitch class set different from that in the A section, and the A' section using an inversion of the pitch class set used in the A section. Unlike the second exercise, the fifth exercise uses tetrachords. Students also were asked to use an accent structure like that in Ruth Crawford Seeger's *Piano Study in Mixed Accents.* Seeger's composition is in steady sixteenth notes, but has accents that group the sixteenths into anything but consistent groups of four.[(18)]

[32] In addition to the improvisation exercises for performance, students were given listening assignments to familiarize them with the works of well known improvisers, and with different styles and techniques of improvisation. They were asked to listen to excerpts from the following recordings: *Aardvark Steps Out,* by the free jazz big band Aardvark; *Heibel,* by the Willem Breuker Kollektief with Greetje Bijma, one of the few free improvisers who is a vocalist; and *Deep Listening,* by Pauline Oliveros, one of the foremost figures in free improvisation.[(19)] Certainly, many other recordings could have been chosen.[(20)]

[33] I will now discuss transcriptions of improvisations by two students who took the course described above.[(21)] Both improvisations are realizations of the second improvisation exercise above. Both of the performers played melody instruments, and so used the trichords as melodies, not as harmonies, and also used intervals from the trichords.

[34] **Example 2** shows the first transcription. **Soundfile 1** is the audio for this improvisation. The performer, Michael Reavey, was a senior at the time of the recording, and took my course as a junior. He was a trumpet performance and music education major, and had some experience playing jazz. In this transcription, as well as the next one, Tn set classes have been used for trichord labels instead of the more familiar Tn/TnI set classes so that the difference between a trichord and its inversion can be shown. The trichords Michael selected are listed at the top of Example 2. He used trichord 014 for the A section, 012 for the B section, and 034, the inversion of 014, for the A' section. Instances of each trichord are labeled on the transcription.

[35] In addition to using the trichords correctly, Michael also made use of intervals from the trichords. In the A and A' sections there are a number of major sixths, labeled on the score as "M6th". The major sixth is a member of interval class 3, one of the intervals in the 014 trichord. Since Michael realized interval class 3 as a minor third each time he played an 014 trichord, the major sixths provided some much needed variety while staying within the intervallic constraints of the improvisation. Another interesting feature is the use of the tritone to articulate phrase or section endings. This occurred at the end of the second phrase, and also at the end of the B section. Michael also used a pitch center of sorts — the improvisation begins and ends on C, and many phrases begin or end on C, E, or G. This C major triad seems somewhat out of place in an atonal improvisation, but it is evidence that Michael was able to develop an overall structure. In addition,

Michael developed rhythmic motives for each section of the work without any prompting from the directions. Rhythms in the first and third sections consisted of mostly quarter and eighth notes, while 16th notes appeared in the B section. The rhythmic motive from the A section, a long note followed by two short notes, appeared in retrograde in the A' section as two short notes followed by a long note.

[36] After the recording, each student was asked to comment on what he thought of using improvisation like this in our aural skills class. Michael commented: "When I play jazz, [20th century techniques] can open up another way to look at things. [Learning these techniques] set a standard for this sort of improvisation when I hear it played. Before, I didn't know what to expect. Now I have a better ear towards it." It is significant that Michael mentioned having a better ear, and further, that he was able to use his improved understanding in his performing and listening.

[37] **Example 3** shows a transcription of the second improvisation. **Soundfile 2** is the audio example. The performer, Dave Reminick, was also a senior at the time of the recording, and took the course as a junior. He was a "classical" saxophone performance major, and was an experienced performer of post-tonal improvisation. The trichords he selected for each section are listed at the top of the example.

[38] Dave mixed up a few of the trichords, which occasionally appeared in the wrong section. 056, which is supposed to be in the A' section only, was also in the A section. These minor errors, however, are entirely offset by the musicality and sophistication of this improvisation, shown particularly by the skillful embedding of multiple instances of the same trichord in just a few notes. One example of this is the opening five notes of the improvisation, labeled motive "M". "M" also returned transposed to announce the beginning of the A' section. An analysis of motive "M" is shown in Example 3 beneath the score. Motive "M" is a member of set class [0167], a set class that is saturated with the 016 trichord, which can be made from any three of its notes. Like Michael, Dave created rhythmic motives for each section of the work without any prompting from the directions. In contrast to Michael, Dave experimented more with register. Each section of Dave's improvisation had a characteristic register, and these registers were joined by the descent to the low C♯ at the end.

[39] Dave commented: "I felt like [these exercises] gave me a chance to actually do some hands-on work with the concept of trichords, and actually work with them in real-time and try to link ideas together and think with them, and I just felt like it promoted a better understanding." I had a bit more time to talk with Dave, and I've included another comment from him that I think is revealing. Dave was describing a new composition he had heard. He said, "[The composer] was basically using the same trichord over and over again. [I said] '016, what's going on here, it's all over the place.' The ear picks up quicker." Like Michael, Dave mentioned his ear, and had developed good enough ears to identify trichords in others' compositions. He also mentioned having a better understanding of twentieth century music, which is of course the ultimate goal of post-tonal ear training.

[40] In summary, I have presented an approach that combines ear training in 20th century music with improvisation, specifically improvisation that is based on 20th century pitch collections and the intervals that they contain. Recorded student improvisations suggest that not only can undergraduates improvise successfully with these constraints, but that the improvisations can strengthen the ears and minds of the performers, as evidenced by student comments.

[41] I'll conclude by quoting the organist and improvisation specialist Gerre Hancock, who sums up my belief about the value of improvisation. "[T]he chief reason to learn improvisation is simply that our musical personalities are incomplete and underdeveloped if we are unable to express ourselves in a spontaneous fashion. The ability to improvise is central to our musicianship; without it, musicians are simply not 'compleat'." (22)

Peter Silberman
University of Rochester
Department of Music
Rochester, NY 14627-0052
ps005e@mail.rochester.edu

Footnotes

1. *National Association of Schools of Music 2001–2002 Handbook*. Reston, VA: National Association of Schools of Music, 2001: 83.

Return to text

2. Steve Larson, "'Integrated Music Learning' and Improvisation: Teaching Musicianship and Theory Through 'Menus, Maps, and Models'," *College Music Symposium* 35 (1995): 80–81.
Return to text

3. Kate Covington, "Improvisation in the Aural Curriculum: An Imperative," *College Music Symposium* 37 (1997): 54.
Return to text

4. Ibid., page 54. A more detailed discussion of "real-world" music learning activities, and the philosophy that lies behind them, can be found in Kate Covington and Charles Lord, "Epistemology and Procedure in Aural Training: In Search of a Unification of Music Cognitive Theory with Its Applications," *Music Theory Spectrum* 16/2 (1994): 159–170. Earlier articles by Covington and Lord apply these ideas to aural skills instruction and computer-assisted instruction. See Kate Covington, "An Alternative Approach to Aural Skills Pedagogy," *Journal of Music Theory Pedagogy* 6 (1992): 5–18; and Charles Lord, "Harnessing Technology to Open the Mind: Beyond Drill and Practice for Aural Skills," *Journal of Music Theory Pedagogy* 7 (1993): 105–117.
Return to text

5. Maria Sagi and Ivan Vitanyi, "Experimental Research Into Musical Generative Ability," in *Generative Processes in Music* ed. by John Sloboda, Oxford: Clarendon Press, (1988): 179–194.
Return to text

6. Gary Wittlich and Deborah Martin, *Tonal Harmony for the Keyboard,* New York: Schirmer, 1989; Sol Berkowitz, *Improvisation Through Keyboard Harmony,* Englewood Cliffs, NJ: Prentice-Hall, 1975.
Return to text

7. Steven Block, "Pitch Class Transformation in Free Jazz," *Music Theory Spectrum* 12/2 (1990): 181–202; Tom Darter, "Piano Giants of Jazz: Cecil Taylor," *Contemporary Keyboard* (May 1981): 56–57. For other transcriptions and analyses of Taylor's improvisations see Matthew Kiroff, "Caseworks as Performed by Cecil Taylor and the Art Ensemble of Chicago: A Musical Analysis," *Jazzforschung/Jazz Research* 33 (2001): 9–130; Steven Block, "Bemsha Swing: The Transformation of a Bebop Classic to Free Jazz," *Music Theory Spectrum* 19/2 (1997): 206–231; Lynette Westendorf, "Cecil Taylor: Indent — 'Second Layer'," *Perspectives of New Music* 33/1-2 (1995), 294–326: and Ekkehard Jost, *Free Jazz,* Graz: Universal Edition, 1974: 66–83.
Return to text

8. I would like to thank Jonathan Atleson and Danny Jenkins for assistance in preparing the graphic and sound files used in this article.
Return to text

9. Cecil Taylor, *Air Above Mountains,* Enja Records, 1992 (recorded 1976).
Return to text

10. Joseph Straus, *Introduction to Post-Tonal Theory,* 2nd edition, Upper Saddle River, NJ: Prentice-Hall, 2000; Stefan Kostka, *Materials and Techniques of Twentieth-Century Music,* 2nd edition, Upper Saddle River, NJ: Prentice-Hall, 1999; J. Kent Williams, *Theories and Analyses of Twentieth-Century Music,* Fort Worth: Harcourt Brace, 1997.
Return to text

11. Lars Edlund, *Modus Novus,* Stockholm: Edition Wilhelm Hansen, 1963; Samuel Adler, *Sight-Singing: Pitch, Interval, Rhythm,* 2nd edition, New York: Norton, 1997; Michael Friedmann, *Ear Training for Twentieth-Century Music,* New Haven: Yale University Press, 1990.
Return to text

12. Meyer Kupferman, *Atonal Jazz,* Medfield, MA: Dorn Publications, 1992.
Return to text

13. Ed Sarath, "A New Look at Improvisation," *Journal of Music Theory* 40/1 (1996): 1–38.
Return to text

14. Jeff Pressing, "The Micro- and Macrostructural Design of Improvised Music," *Music Perception* 5/2, 1987: 153–172. Like

Sarath quoted above, Pressing distinguishes between object memory (small building blocks) and process memory (global processes). In contrast to Sarath, Pressing makes no claim that one is more appropriate to improvisation than the other, but suggests that the improviser should develop both types of memory. See Jeff Pressing, "Cognitive Processes in Improvisation," in *Cognitive Processes in the Perception of Art,* ed. by W. Ray Crozier and Antony Chapman, Amsterdam: Elsevier, 1984: 345–363. Elsewhere, Pressing develops detailed models of the improvisational process that incorporate findings from cognitive science and neuroscience, along with insights gained from studies of improvising musicians and improvisation method books. See Jeff Pressing, "Improvising: Methods and Models," in *Generative Processes in Music,* ed. by John Sloboda, Oxford: Clarendon Press, 1988: 129–178; and Jeff Pressing, "Psychological Constraints on Improvisational Expertise and Communication," in *In the Course of Performance,* ed. by Bruno Nettl and Melinda Russell, Chicago: University of Chicago Press, 1998: 41–67.
Return to text

15. Anne Carothers Hall, *Studying Rhythm,* 2nd edition, Upper Saddle River, NJ: Prentice-Hall, 1998; Samuel Adler, *Sight-Singing: Pitch, Interval, Rhythm,* 2nd edition, New York: Norton, 1997; Daniel Kazez, *Rhythm Reading,* 2nd edition, New York: Norton, 1997.
Return to text

16. For more information about student reactions to improvisation, see George Lewis, "Teaching Improvised Music: An Ethnographic Memoir," in *Arcana: Musicians on Music,* ed. by John Zorn, New York: Granary Books, 2000: 78–109.
Return to text

17. The exercises above come from the following books and article, all of which contain valuable improvisation exercises, from beginning to advanced levels: David Darling and Bonnie Insull, *Return to Child,* 3rd edition, Goshen, CT: Music for People, 1997; Roger Dean, *Creative Improvisation: Jazz, Contemporary Music and Beyond,* Milton Keynes, UK: Open University Press, 1989; W.A. Mathieu *The Listening Book,* Boston: Shambhala Publications, 1991; John Buccheri, "Finding Your Own Music - A Case for Free Improvisation," *College Music Society Newsletter,* September 2002. Another book that easily could be adapted for music theory or aural skills courses, because it gives detailed instructions about working with pitch, is Gerre Hancock, *Improvising: How to Master the Art,* Oxford: Oxford University Press, 1994. At the other end of the spectrum are two books that list improvisation exercises for children that require little instrumental expertise, which could be used for warmup or introductory activities: Trevor Wishart, *Sounds Fun: A Book of Musical Games,* SCDC Publications, 1975; and Trevor Wishart, *Sounds Fun 2: A Second Book of Musical Games,* London: Universal Edition, 1977. The composer Bruce Adolphe has developed exercises that are more conceptual (for example, improvising in the style of a well-known composer, thinking of a sentence and then "playing" it on an instrument, etc.) that could be used in a variety of situations. See Bruce Adolphe, *The Mind's Ear,* St. Louis: MMB Music, 1991. Saxophonist Larry Ochs discusses devices for structuring improvisations for multiple performers in Larry Ochs, "Devices and Strategies for Structured Improvisation," in *Arcana: Musicians on Music,* ed. by John Zorn, New York: Granary Books, 2000: 325–335. Two sight-singing/ear training textbooks that also contain post-tonal improvisation exercises are Friedmann, *Ear Training for Twentieth-Century Music,* and Vernon Kliewer, *Music Reading: A Comprehensive Approach,* Englewood Cliffs: Prentice-Hall, 1973. For an overview and discussion of improvisation pedagogy and method books, see Pressing, "Improvising: Methods and Models", 141–145.
Return to text

18. For a detailed analysis of this work, see Cynthia Pace, "Accent on Form-Against-Form: Ruth Crawford Seeger's Piano Study in Mixed Accents," *Theory and Practice* 20 (1995): 125–148.
Return to text

19. Mark Harvey and the Aardvark Jazz Orchestra, *Aardvark Steps Out,* 9 Winds Records, 1993; Willem Breuker Kollektief, *Heibel,* BVHAAST, 1991; Pauline Oliveros, Stuart Dempster, and Panaiotis, *Deep Listening* New Albion Records, 1989.
Return to text

20. For an excellent discography of recorded improvisations, along with discussion, see John Corbett, *Extended Play,* Durham: Duke University Press, 1994.
Return to text

21. I would like to thank Michael Reavey and Dave Reminick, who performed the improvisations discussed in this article.
Return to text

22. Hancock, *Improvising: How to Master the Art,* vii.
Return to text

Copyright Statement

Prepared by Brent Yorgason, Managing Editor and Tahirih Motazedian, Editorial Assistant