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Volume 14

To *Doh* or not to *Doh*: The Comparative Effectiveness of Sightsinging Syllable Systems

Mary Jo Lorek & Randall G. Pembrook

The selection of a proper syllable system to facilitate and improve sightreading has been a topic of debate among sightsinging instructors for years. While teachers and students seem to have preferences for various systems (preferences which they typically will defend vehemently when challenged), often the favored approach is a function of which system was learned first. Killian (1991) mentions the "this works for me school of thought."[1] Rogers (1996) labels the state of sightsinging instruction in the United States as being a " . . . pedagogical hodge-podge."[2] At times the choice is based on a careful review of the perceived merits inherent in a given system. Another manner of selecting a system, wherein choices are based on information attesting to the effectiveness of a particular approach, has been virtually unavailable due to the sparsity of research relating to syllable systems. In 1959, Bentley insisted that "proof must be given from experiments in which each system is used with equal enthusiasm by equally good teachers, and with groups of pupils of comparable age, ability and interest."[3] Unfortunately, few studies of this type have been reported.

The selection of an effective syllable system is an overwhelming task considering the number of choices. In the spring of 1989,

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[1]Janice N. Killian, "The Relationship Between Sightsinging Accuracy and Error Detection in Junior High Singers," *Journal of Research in Music Education* 39 (1991): 217.

[2]Michael Rogers, "The Jersild Approach: A Sightsinging Method from Denmark," *College Music Symposium* 36 (1996): 149.

[3]Arnold Bentley, "Fixed or Movable Do?" *Journal of Research in Music Education* 7/2 (Fall, 1959): 167.

Pembrook and Riggins (1990) surveyed nearly 300 college sightsinging teachers and found that at least ten "syllable" systems were in use.[4] These included well-known systems such as fixed and movable *doh* but also some less popular systems such as inflected letter names, in which singers sing the note name (e.g., "G-sharp"), and "fixed number" systems, in which 1 stands for middle-c, 2 for c-sharp, and so forth.

The related literature concerning sightsinging syllable systems seems to divide into two large categories and one smaller one. These include: (1) articles describing the history and use of various systems; (2) articles proposing the strengths and weaknesses inherent in the systems; and (3) data-based studies detailing the results when various systems are compared.

The first type of literature includes articles by Dean (1965), Collins (1979), Shephard and Jordan (1884), Killam (1987), and the aforementioned study by Pembrook and Riggins (1990). Jerry Dean's thesis (1965) entitled "A History of Solmization and a Comparative Study of American Pitch Verbalization Methods"[5] includes a survey of 120 colleges and universities throughout the United States, in an effort to determine syllable system preferences, particularly with respect to neutral syllable systems. His findings indicated that note names, neutral syllables, scale degree numbers and movable *doh* systems were employed frequently and approximately equally while fixed *doh* systems (with and without chromatic inflection) were used less regularly.[6] An important dissertation in this area by Irma Collins (1979) reported movable *doh*, numbers, and "lah" to be the most frequently used systems.[7] Shephard and Jordan (1984) suggested that Western listeners and by extension, Western sightsingers

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[4]Randall G. Pembrook & H. Lee Riggins, "Send Help! Aural Skills Instruction in U.S. Colleges and Universities," *Journal of Music Theory Pedagogy* 4/2 (1990): 231-241.

[5]Jerry M. Dean, A History of Solmization and a Comparative Study of American Pitch Verbalization Methods. Unpublished Master's thesis, University of Texas, Austin, 1965.

[6]Ibid., 43.

[7]Irma H. H. Collins, Current Attitudes and Trends in the Teaching of Sight Singing in Higher Education, Unpublished doctoral dissertation, Temple University, 1979.

may be predisposed to systems like movable *doh* or numbers which are based on hearing by scale degrees.[8] They state:

> Judgements of relations between tones in a sequence derived from the major diatonic scale by systematic distortions (either equalizations or stretching of intervals) reveal that Western listeners interpret the tones relative to that musical scale even when they try to judge the purely physical relations between the tones.[9]

In addition to documenting the wide array of systems in use, Pembrook and Riggins found that numbers were used for student sightsinging most frequently by the 279 college sightsinging teachers who responded to the survey. Movable *doh* and neutral syllable systems were in a virtual tie as the second most-used system.[10]

In the second category of literature, authors have attempted to evaluate the inherent qualities of syllable systems to determine the most effective approach. In 1959, Bentley proposed several arguments for movable *doh*, concluding that it is "a most useful means of aural training and teaching music reading."[11] Walt Multer (1978) offered a detailed discussion of the advantages and disadvantages of fixed and movable *doh*.[12] He felt that every musician should understand and use both. Consequently, according to Multer, it does not really matter whether one system is preferred since it is incumbent to know and use fixed and movable *doh*.[13] In 1991, Timothy Smith presented an exposition of fixed and movable systems, and their respective advantages and disadvantages. Smith proposed that movable *doh*, with *doh* as the tonic in minor was the superior system in the greatest number of areas.[14] This point was rebutted

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[8]Roger N. Shepard and Daniel S. Jordan, "Auditory Illusions Demonstrating that Tones Are Assimilated to an Internalized Musical Scale," *Science* 226 (December, 1984): 1333-1334.

[9]Ibid., 1333.

[10]Pembrook & Riggins, 234.

[11]Bentley, 167.

[12]Walt Multer, "Solmization and Musical Perception," *Theory and Practice* 3/1 (1978).

[13]Ibid., 47.

[14]Timothy A. Smith, "A Comparison of Pedagogical Resources in Solmization Systems," *Journal of Music Theory Pedagogy* 5/1 (1991): 1-23.

by Houlahan and Tacka (1992) in an ensuing issue. They defended the movable *doh* system with *la* as the tonic in minor contending that this system helps develop a better understanding of aural relationships before depending on visual input and theoretical rules.[15]

Steve Larson (1993), also joining the debate about *doh*- versus *la*-based minor, examined the cognitive processes of sightsinging and transcribing to point out that certain syllable systems are "better suited" than others for specific purposes (i.e., singing in major, singing in minor, transcribing, etc.). He suggests that a syllable system should not be chosen cavalierly.[16]

Articles which have compared the effectiveness of syllable systems based on students' sightsinging capabilities while using them are few in number, particularly when compared to descriptive, historical, and philosophical articles. In 1946, Buchanan compared the scores of two groups of students—one using fixed *doh* and one using movable *doh*. He concluded that amateur singers can be expected to exhibit more improvement using movable rather than fixed syllables.[17] Other pertinent published, empirical studies could not be found.

In light of this paucity of data, a series of studies was initiated at the researchers' university to test the comparative effectiveness of the most frequently used sightsinging syllable systems as reported by Pembrook and Riggins. Every effort was made in those studies to ensure that potential problems identified by Bentley in 1959 [equivalency of groups, competence of instructors, and an enthusiasm for the approach][18] were adequately addressed. The remainder of the paper details four studies that compared solfege effectiveness in various conditions.

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[15]Michael Houlahan & Philip Tacka, "The Americanization of Solmization: A Response to the Article by Timothy A. Smith, 'A Comparison of Pedagogical Resources in Solmization Systems,'" *Journal of Music Theory Pedagogy* 6 (1992): 137-151.

[16]Steve Larson, "The Value of Cognitive Models in Evaluating Solfege Systems," *Indiana Theory Review* 14/2 (1993): 115.

[17]Walter Buchanan, Comparison of Fixed and Movable Solfege in Teaching Sight Singing From Staff. Unpublished doctoral dissertation, University of Michigan, Ann Arbor, 1946.

[18]Bentley, 167.

STUDY #1

The researchers felt that the initial study should compare some type of movable system (e.g., movable *doh* with *doh* as tonic in major and *la* as tonic in minor or scale degree numbers) to a fixed system (e.g., fixed *doh* or inflected note names) to some type of "control" if possible. Because three sections of freshman ear training classes were available, a decision was made to compare all three approaches in the initial study. Though the Pembrook and Riggins survey had indicated that numbers were used more frequently than movable *doh*, movable *doh* was selected as the methodology from the first category for two reasons. First, the survey conducted in 1989 had indicated that of all the teachers using a single approach, movable *doh* was the most popular methodology[19] and second, historically, a review of the literature seemed to indicate that the solfege debate has focused on fixed *doh* and movable *doh* rather than fixed *doh* and numbers.

Initial screening indicated that very few incoming freshmen at the authors' university were entering with command of a particular syllable system for singing. Therefore, subjects were randomly assigned to one of three groups. Subjects in group 1 (movable *doh*) were instructed to use solfege wherein *doh* indicated the tonic in major and *la* in minor. Subjects in group 2 (fixed *doh*) used *doh* for C regardless of the key, *di* for C-sharp, and so forth. Subjects in group 3 were required to do all vocalizing during sightsinging class on a neutral syllable. The neutral syllable "lah" was used because of its tendency to encourage proper breathing and singing mechanics. Therefore, regardless of the key or the specific pitches, subjects in group 3 always sang on "lah."

To insure the validity of the study, various factors that could account for group differences at the outset of the study were analyzed in an attempt to attain balanced groups. All subjects were tested on a sightsinging pretest. Responses, which were cassette-recorded, were analyzed by the ear training faculty and divided into high, medium, and low accuracy groupings. Equal numbers

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[19]Pembrook and Riggins, 234.

of subjects from each category were assigned to the three experimental groups with a total of 18 students per group (N=54 subjects). Very few subjects indicated a predilection for a particular syllable system. Those that did were randomly distributed among the three groups. Students were also equally divided among groups with respect to high school grade point average in an attempt to balance for intelligence and academic ability.

Attempts were also made to guarantee equivalency of instruction and equal motivation among instructors. First, two teachers were selected who believed in the superiority of movable *doh* and fixed *doh*, respectively. The third instructor felt that syllable systems were not essential in teaching college students to sightsing. That individual taught the neutral syllable section (group 3). All were professors who had taught ear training for several years at the college level. Graduate teaching assistants were not used.

All three instructors used the same texts (Ottman's *Music for Sight Singing* , Berkowitz, Frontrier and Kraft's *A New Approach to Sight Singing*, and Hall's *Studying Rhythm*) and supplementary materials (e.g., choral scores and melodies composed by the instructors). Lesson plans were scripted so that instructors practiced the same examples the same number of times. However, the exact feedback of the instructors was not outlined since it would be based on student responses and therefore could not be anticipated.

Classes met for 50 minutes, twice a week during a 15 week semester. The semester during which the initial study was conducted was the first in a four semester undergraduate ear training sequence, including dictation, sightsinging and error detection. The university did not have a computer lab for additional practice at the time of the initial study. Each instructor missed only one of the 30 scheduled classes. All classes met from 9:00 until 9:50 a.m. on Tuesdays and Thursdays. This prohibited information about the testing examples from being circulated from class to class on testing days.

Students were tested three times for written dictation and error detection and three times for sightsinging during the semester. Only the scores on the sightsinging tests were originally used to evaluate the effectiveness of the three teaching techniques. Students in all classes were expected to use the appropriate syllable system dur-

ing testing, but were evaluated by the classroom teacher only for pitch and rhythmic accuracy, including maintaining a steady beat with no hesitations. Grading of syllables would have created an extra scoring deficit variable for two of the three groups. All sightsinging exams were taped and transcribed for objective evaluation. Students were allowed to study the sightreading examples for up to 2 minutes before attempting them, although most students in all groups began before the preparation time had expired. Examples simulated but did not duplicate examples from the sightsinging textbooks.

At the end of the semester, results from students who had missed no more than three classes and had taken all three sightsinging exams were analyzed. This included 17 from the fixed *doh* class, 15 from the movable *doh* class, and 13 from the neutral syllable class. Results indicated no significant difference between the three groups.[20] Averages of the percentage correct of the three sightsinging tests were calculated, and means for three groups were as follows: fixed *doh* = 91.51%, "lah" = 90.53%, and movable *doh* = 89.78%. Slight differences in the averages were attributed statistically to chance rather than the effect of the main factor—syllable system. Out of curiosity, one additional analysis of overall scores was conducted, which included students' dictation test results. Again, no significant difference was found between the treatment groups.[21]

STUDY #2

The first study was repeated for three reasons. First, it was felt that this initial research required replication and a larger data pool before results could be considered valid. Second, the researchers decided that even more controls should be used to insure group equivalency. Finally, it was speculated that while no appreciable difference due to syllable system could be identified after 15 weeks (1 semester) it was possible that the systems could affect students to a greater degree over the course of an entire year.

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[20] $F[2,42]=.21$, $p=.81$.
[21] $p=.73$.

Forty-two more subjects at the same institution were divided among three classes and received instruction using either movable *doh*, fixed *doh*, or "lah." To create three equal groups, students again were assigned to one of three classes based on high school grade point average and entering sightsinging ability as determined by an entrance test. In addition, attempts were made in study #2 to divide students according to their applied instrument type and their scores on a melodic perception test which assessed students' ability to detect minute changes in frequency. Though different instructors were used in this study because of re-assignment of duties within the ear training department, all three instructors were again experienced college ear training teachers with more than five years of experience. Instructors met weekly to review the scripted lesson plans and select and develop materials to augment the texts (Ottman's *Music for Sight Singing* and Benward's *Ear Training: A Technique for Listening*. Killam had identified these as the most frequently used materials for sightsinging and ear training courses in her survey.[22])

Students were again tested six times per semester—three times in sightsinging and three times in dictation. Procedures and grading methods were identical to those described in Study #1. A statistical analysis was again calculated, first for data from the fall semester and then for scores from the second term. Again, results indicated no significant difference in Fall semester scores as a function of syllable system.[23] Scores were nearly identical to the previous study. Means for the groups were as follows: fixed *doh*= 89.38%, "lah" = 88.62% and movable *doh* = 86.88%. Even though the order of the second and third groups switched (Fixed *doh*=92.52, movable *doh*=92.29, and "lah"=89.14), the means from the second semester still indicated no significant differences. Based on these two studies conducted over three semesters with 87 subjects during the first year of university ear training study it would appear that the selection of a particular, single syllable system is not critical to students' short-term sightsinging success.

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[22]Rosemary Killam, et al, "Survey and Results: Most-Used Theory Texts in US Colleges and Universities," The University of North Texas, 1987.

[23]$F[2,39]=.34$, $p=.71$.

STUDY #3

After both of the initial studies indicated that fixed *doh*, movable *doh* and "lah" produced statistically equivalent results within the timeframe of the study, it was decided that a sightsinging syllable system for all music classes at the university would be adopted based on factors other than its immediate efficacy. Because survey results indicated that movable systems were more prevalent than fixed ones in ear training instruction at other institutions, it was decided that a movable system represented potentially the most valuable option for students who might be transferring to other undergraduate programs, or completing graduate music degrees elsewhere. Therefore, all members of the next entering freshman class received instruction using movable *doh*. By the fourth semester of instruction, when classroom material included modulating melodies and melodies exhibiting chromatic inflection, students began complaining about the "usefulness" of the movable *doh* system. Study #3 originated from those complaints.

Keeping in mind that the original studies had indicated no difference in the effectiveness of fixed *doh*, movable *doh*, and "lah" during the first year, a decision was made to allow students to abandon the movable *doh* syllable system while being tested on selected melodies during the fourth semester. Because these students had not been exposed to fixed *doh*, it was posited that an implementation of that system during the final semester might be frustrating because of the proactive interference of previously learned movable solfege syllables and, therefore, counterproductive for the students. However, instructors encouraged students to use the neutral syllable "lah" when chromatic and modulating melodies made movable *doh* syllables appear unwieldy. The researchers were curious to discover (1) if students would prefer this approach and, more importantly, (2) whether it would facilitate, inhibit, or have little effect on their sightsinging capabilities under those circumstances.

In previous studies, it was essential to create equivalent groups and instruction in order to eliminate group variance as a confounding variable. In Study #3 subjects sang half of the melodies on "lah" and half using movable *doh*; therefore, subjects served as their own control. Subjects were randomly assigned to sing "lah" or movable *doh* first. Using subjects as their own control on two melodies for

each testing, however, necessitated the creation of similar melodies to be sightread under those two conditions. All melodies used under the two conditions had the same number and types of intervals, the same types and number of chromatic alterations and were identical regarding rhythmic complexity and total length as measured by number of notes. Furthermore, melodies were alternated so that half of the subjects sang "lah" on one melody and half sang "lah" on the second melody.

Thirty-seven students took part in the study. The testing included two melodies featuring chromatic patterns (one sung on "lah" and one sung on movable *doh* syllables) and two melodies featuring modulating passages (again sung using the two syllable systems). The location of the key change was indicated on the test paper for modulating melodies, so that students singing movable *doh* would know on which note to change syllable orientation. Students were given two minutes to review the passage as in Studies #1 and #2. All melodies sung by the subjects were cassette-recorded and then transcribed and analyzed at a later date for greater reliability of accurate assessment.

The mean for the melodies sung using movable *doh* was 85.41% and the mean for the melodies sung on "lah" was 84.16%. These scores were compared and again no statistically significant difference was found.[24] Sixteen of the 37 students being tested professed a preference for movable *doh* which they had used for nearly two years. Eleven stated no preference and six preferred neutral syllables while four had no opinion. The scores of the 22 who professed a preference were analyzed comparing their sightsinging accuracy when using the preferred and non-preferred systems. Results of the comparison revealed no significant difference in accuracy under the two conditions (preferred system mean=85.68%; non preferred mean=82.23%).[25] Students were statistically equal in accuracy when using the system of choice and when using an "imposed" system, though the difference in accuracy came closest to statistical significance of any comparison described in this paper.

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[24] $t[36]=.90$, $p=.37$.
[25] $t[21]=1.69$, $p=.11$.

STUDY #4

Because the results of the previous studies had indicated no significant difference in effectiveness among the three broad categories of a movable system, a fixed system, and a control in developing sightsinging accuracy, the results from the Pembrook and Riggins study were analyzed for the next most logical direction for research. Their figures had indicated that numbers was the most frequently used sightsinging system. Therefore, a decision was made to compare two popular approaches within the movable category—numbers vs movable *doh*.

The ensuing incoming class (37 students) was divided into three classes with still more attention given to group equivalency. Classes were structured to insure statistically equivalent numbers with relation to gender, high school grade point average, entering sightsinging ability as determined by a pretest, applied instrument experience, and years of piano study. In spite of testing *two* systems, students were divided into *three* classes to provide good student/teacher ratios. Because it was anticipated that two fall classes would be combined during the second semester, these two sections were taught using numbers as the sightsinging syllable system, while the other class was conducted using movable *doh*.

The same textbooks were used as in Study #2 (Ottman and Benward/Kolosick). During this particular semester, students were tested five times during the semester, with only two sightsinging tests (because of time constraints of individual testing) and three dictation tests. Again, scores were not significantly affected by the use of a particular syllable system.[26] Means were 93.17 for 22 numbers students in two classes and 94.10 for 15 movable *doh* students in the third class.

DISCUSSION

The results of these four studies seem to indicate that within a college setting, with music majors over a one- or two-semester period,

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[26] $t[35]=.49$, $p=.63$.

no particular voiced system, be it movable *doh*, numbers, fixed *doh*, or a neutral syllable, produces significantly higher sightsinging scores than another. The results must be viewed carefully, however. Regardless of the syllable system a student may be attempting to use, it is impossible to know what may be taking place at some cognitive level. The fact that the neutral syllable group consistently had the largest range of scores on tests and consequently the largest standard deviations may suggest that successful students in that group were using some type of subvocalized system and unsuccessful students, who had the lowest scores of the three groups in Study #2, were in fact singing on "lah" without placing the pitch to be sung on some type of movable or fixed grid. This observation is largely speculative and should be investigated in future research.

While some in the neutral syllable group admitted a non-vocalized use of syllables, it should be noted that something representing nearly the opposite also occurred. During the course of the four studies, it was not at all unusual to witness students in the fixed *doh*, movable *doh*, and numbers groups who sang the melodies correctly according to pitch and rhythm but did not vocalize the proper syllables while doing this. Apparently, for those students, the syllables represented an abstract series of sounds which were required while singing the test examples but which were not needed or used to locate the pitch.

Another aspect of the study worthy of discussion relates to the "control group" which used "lah." As Butler and Lochstampfor (1994) point out "conditions are not ideal for mounting rigorous experimental studies of aural training methodology in the most realistic situation, which is when actual aural training classes are used in the study."[27] A true control group, wherein students were totally exempted from the curricular requirements of four semesters of ear training courses, was not implemented in these studies. Ethical considerations relating to purposefully creating a group of musicians whose aural skills development might be retarded as a result of that experimental methodology prevented the researchers from

[27]David Butler and Mark Lochstampfor, "Bridges Unbuilt: Aural Training and Cognitive Science," *Indiana Theory Review* 14/2 (Fall, 1993): 7.

implementing this design. Nonetheless, it would be interesting to see the results from a group of individuals who are restricted from developing aural skills in the traditional theory curriculum and instead are limited to other avenues such as sightreading in their ensembles, listening in applied lessons, composition or arranging classes, and so forth. The results of such a study might be greatly reinforcing to ear training teachers if the students were found to have comparatively inferior aural skills, or they might challenge the field to re-evaluate ear training pedagogies if that group of students developed aural skills equal to students in traditional programs.

Two of the three teachers in the first study could not continue as instructors for the second study and were replaced. Because the results of that second study replicated those from the initial one (even the rank of high to low means of the first semester of Study #2 was identical to Study #1), it was theorized that teacher effect was minimized by the standardization of materials used in class and the scripted/timed lesson plans. This factor would appear to bolster the validity of the conclusions indicating no difference in sightsinging development as a function of the syllable system employed.

FUTURE RESEARCH

Three future research studies seem evident from these initial investigations. First, additional research needs to be conducted where combinations of approaches are used and compared to other combinations or single approaches (e.g., a section using fixed *doh* and numbers vs. movable *doh* or a section using movable *doh* and numbers vs. numbers only). The research by Pembrook and Riggins indicates that most ear training teachers use more than one method.[28] Treatments featuring a combination of approaches might increase the external validity of future studies.

Second, the results of this series of studies must be evaluated within its context. All studies were conducted with music majors in their freshman or sophomore years. As entering freshmen, most were not proficient with any type of syllable system; those that

[28]Pembrook and Riggins, 234.

were had the option of placing out of the beginning courses by means of a proficiency test. This study did not attempt to answer the question of whether any one system (fixed *doh*, movable *doh*, numbers, or *la*) is most effective in developing sightsinging abilities if started at an early age. Some elementary music education methodologies (e.g., the Kodaly approach) strongly advocate the use of movable *doh* systems. Future research should address the efficacy of such a system when initiated in preschool or kindergarten and continued throughout the first two years of college. Educators interested in an answer to that longitudinal issue may not be persuaded by information from this study which was limited to college freshmen and sophomores. Nonetheless, those who teach undergraduates in college ear training classes may see applications in the current research, especially if their students exhibit limited previous solfege experience as the subjects in these four studies did.

Finally, future studies should attempt to gather more information regarding student attitudes toward solfege systems. Do novices object to using unfamiliar solfege syllables initially and then come to appreciate them later? Surprisingly in Study #3, when asked to sing "lah" in their fourth semester of instruction in movable *doh*, students who were the most vocal in criticizing the awkwardness of movable *doh* in chromatic and modulating passages were the most resistant to change. A few of the freshman assigned to the "lah" class in Study #2, and the numbers classes in Study #4 expr essed a desire to learn movable *doh*, although many students assigned to the "lah" class expressed relief in avoiding solfege. If syllable systems are equally effective in creating sightsinging accuracy, perhaps it is not imperative that instructors or department chairs choose the methodology. Students might choose based on personal preferences. The results in Study #3, when students chose their own system, came closest to statistically significant differences at traditional error levels.

All of these issues are important to the process of life-long development of aural skills. The pursuit of the research in this article was undertaken as an attempt to better understand the effectiveness of current methodologies and to stimulate thinking toward the development of a "most effective system," if indeed that is possible.

Review of "To *Doh* or Not to *Doh*"

Michael R. Rogers

This research, in my opinion, is seriously flawed. I do not believe that sufficient understanding of the crucial issues in sightsinging pedagogy is exhibited for the described experiments to produce meaningful insights. This approach is simply on the wrong track altogether for both musical and empirical reasons. Basic principles of functional tonality are sometimes dishonored and the research paradigm seems heavily influenced by the tacit assumptions of rationalistic inquiry and the conventional quantitative values of validity, reliability, objectivity, mean scores, etc. At the end of my comments I will suggest an alternative research design that might encourage more suitable and fruitful results. But first, the following specific problems can be identified with this study:

1. This is a classic case of research offering solutions for a non-problem. The crux of sightsinging is not *labeling systems* per se (how to name the notes when singing), which the authors seem obsessively concerned with, but rather *hearing systems* (the mental processing and organization of one's thinking to accurately "find" and, more importantly, "to feel" pitches while singing). In other words, the authors fail to make the fundamental and absolutely crucial distinction between "what to call things" and "the methodologies employed to enculturate *tonal bearings*" (knowing where one is in a key at any given time, which is the real task of sightsinging). It is easy to confuse the "names" and the "methodologies," but, in fact, only a tenuous relationship exists between the two. The heart of the authors' misunderstanding is that the relationships which *do* exist are not the ones they are testing for in their experiments (more on this later).

Although, as the authors say, there may be as many as ten different labeling systems, most hearing methodologies boil down to either some kind of *intervallic* approach or some kind of *functional* approach. In the first case, the focus is on movement from note to note, with the relationship of successive pitches to one another of paramount importance. In the second case, the focus is on the relationship of pitches to a central tonic with longer-range (non-adjacent) connections of paramount importance. If research of some kind is really needed at all for this topic, which I doubt, it should be designed to get at the difference between these two approaches and not the labeling systems themselves.

2. Another distinction that escapes the authors' attention is the difference between acquiring music reading skills and learning scale-degree function. For example, it seems meaningless to compare a "fixed-do" system with a "moveable-do" system because the goals of the two approaches are entirely different. It would be like measuring the accuracy of someone's spoken French using the grammar rules of German—they each live in their own universe with their own reasons for existence. The benefit or advantage or purpose of "fixed do" is to improve or teach music reading (the ability to quickly and accurately identify the events of printed notation); it is "a way to say what you see" without necessarily attaching some meaning to each detail. This is an important, although preliminary, step in teaching sightsinging. This neutrality can actually be useful by withholding assignment of meaning in certain environments (e.g., highly chromatic or ambiguous settings)—that is, the label does not overdetermine the precise function of a pitch, which can happen in more value-laden approaches. It is, then, a necessary but not sufficient condition for informed sightsinging.

The point of using "moveable do," on the other hand, is entirely different: namely, to learn the "tonal bearings" mentioned above (i.e., to hear the network of attractions—the tugs and pulls and aversions—that pitches have for one another within a tonal magnetic field). One system is *visual;* the other is *aural.*

You might say the skill that emanates from "fixed do" can be exhibited *externally* (i.e., you can observe the results by direct listening), whereas the skill that emanates from "moveable-do" prac-

tice can only properly be exhibited *internally* (to really know if students are hearing in the way you want, one would have to electronically probe the appropriate spot in the inner brain). Or perhaps you could indirectly estimate the success of the methodology by observing performance subtleties—the "musical interpretation" of a given passage—as the student invests particular pitches with a particular nuance or weight by nudging or stretching or applying a lighter or heavier accent. It is not simply a matter of tabulating "right" or "wrong" notes on a score sheet as these experiments do.

Here is an experiment that, in my opinion, would be meaningful (i.e., it would be a good test of whether your students "get it"—the hearing of tonality). Have them sing the pitch pattern "C-D-E-F" in two different ways—first as scale degrees 1-2-3-4 (in C major) and then as 5-6-7-1 (in F major).[1] [Whether they actually sing with numbers, fixed do, letter names, moveable do, la-la-la, dooby-dooby-doo, on a kazoo, or just hum, is totally immaterial. The ability to *think and hear in the context of a specific key* is what is being tested, not whether or not they can sing specific notes as measured in frequency ratios.]

In the first case (C major), the desired sensation is that of leaving a departure point and moving tentatively toward a poised, "still-ready-for-action" stopping place in mid-stream; in the second case (F major), the desired sensation is of gathering momentum for a point of arrival, with a convincing degree of finality achieved by the end. You will know the difference by carefully observing the students' kinesthetic reaction and interpretive style and phrasing—in the first case, they may decrescendo and in the second, increase the dynamic level as the goal note is reached, or they may inflect the pitch interpreted as tonic—either the first or last—with a greater sense of downbeat or stress.

Performing this or trying to hear it (or grade it on an experiment) as merely a "whole-step/whole-step/half-step" pattern—the neutral, value-free possibility—has nothing to do with the experi-

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[1]This experiment and some other points are taken from my article, "The Jersild Approach: A Sightsinging Method from Denmark," *College Music Symposium* 36 (1996): 149-161. Ironically, the authors quote from the first paragraph of this article in their introduction but may not have read all the way to the end.

ential feel of the two quite different tonal situations. The trouble with most sightsinging approaches—and, I might add, with the experiments in this article—is that their goal is merely *accuracy*—singing the correct pitch at the right time. The real goal ought to be *hearing the music in particular way*—a way that is musical (i.e., a way that respects the encoded internal-movement proclivities of the specific context). The entire job of sightsinging is context sensitivity and that can only be done by encouraging students to hear tendency-tone patterns or what Wedge used to call "active vs. rest-tone" patterns.[2] Of course, no one would deny the value of accuracy as well. I am only saying that mere accuracy is not enough.

Yet another way to define the issue is that we only know we have done our job as sightsinging teachers if students can exhibit sensitivity to musical chiaroscuro. We can't really tell if they have learned anything about how tonality itself actually operates—and isn't this why we do sightsinging in the first place?—simply by observing if they sing the right notes on some test because those "right notes" may be performed in the most antimusical way imaginable (e.g., as a series of flat, undifferentiated pitches unrelated—in their mind's ear— to any defining tonal grid and thus totally lacking any distinctive or individuated meanings of "tension and release" or of "leanings and resolutions"). And this is why an accuracy report as given in the experiments, just by itself, offers only an empty number.

In fact, we have all witnessed such monochromatic performances that plod stiffly and computer-like from note to note—either in the sightsinging class or more likely on the concert stage; we often begrudgingly have to give credit for such a theory performance even though the invisible threads of connection between pitches are missing. It is in this sense that this article misses the boat. The conception of the problem and the testing methods are just too primitive to distinguish between a performance that is correct (maybe even accidentally correct), yet mechanical, compared to one that is correct (for the right reasons) *and therefore musical.* From how the experiments have been designed, there is no way to tell what the reason might be for a "correct" answer.

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[2]See George Wedge, *Ear Training and Sight Singing*, Schirmer, 1921. This is still one of the best sightsinging books ever written.

3. One could argue that it doesn't make any difference which syllable system (fixed or moveable) is used, as the article seems to prove—and, for all I know, perhaps this was its goal—so long as scale-degree function is being encouraged or that we could teach several methods simultaneously. Although this attitude appears to promote an openminded and ecumenical spirit, in practice it produces a pedagogical nightmare. Once syllables (or numbers for that matter) are used to represent scale-degree tendencies (the moveable approach), they then become forever tainted, so to speak, for just simple objective naming purposes; in other words, once the functions have been let out of the bag and identified, one cannot so easily go back to the more pedagogically impartial "fixed-do" system—at least it will never have the same meaning. It would be like trying to put toothpaste back into the tube.

The reason for always calling the leading tone "ti" is to inculcate the sensation of tension (and its implied resolution to tonic) in the mind's inner ear; it's the special "feel" of the 7-1 pattern that is being associated with a specific name (ti-do). To suddenly call other scale-degree patterns, with their different sets of encoded meanings, by the same name is to court disaster; confusion will reign (maybe even rain) in the classroom. All the other basic patterns (5-1; 2-1; 6-5; 4-3; etc.) have their special "feels" or flavors, too. Tonality is simply the sum of all these special flavors with its own composite overall "feel," which in turn is different from modality, expanded tonality (of the early 20th-century kind), and atonality.

Of course, the meanings or "roles" of pitches change according to their surroundings. For example, the tendency of scale degree 4, in the company of 7, is to pull *down* to 3 (operating as part of a dominant function), whereas the tendency of 4, in the company of 6, is to pull *up* to 5 (operating as part of a predominant unit). Many dozens of additional examples could be cited. This is what sightsinging is all about: finding, understanding, hearing, and finally being able to recognize, contextualize, and perform, from one's mental stockpile, these many dozens of patterns. It's certainly *not* about fussing over what to call each note.

4. The goal of sightsinging, then, is to learn what it feels like to move about within the tonal universe—tonal bearings again—and the reason for naming individual notes is to help remember what *role* they each play. It's the roles themselves, not the names, that count. You could make up words from a fake language if you wanted to name the notes. The reason the results are about the same in every case in the experiments reported on in this article is obvious: the students were probably all thinking about how to locate their bearings within a key in about the same way—they were using scale-degree function whether they knew it or not and perhaps even independently of their naming system in some cases. Most bright students will figure this out on their own from cultural conditioning and trial and error *in spite of whatever official system of labels is being taught by the teacher or being used on a test or in an experiment.*

One glimmer of insight along these lines peeps through in the article when the authors admit that "it is impossible to know what may be taking place at some cognitive level" and that the students singing "la-la-la" could have been thinking functionally all along (although they call it "subvocalizing" rather than "thinking functionally" as that term may not be part of the operational vocabulary of this research.) Of course! In fact, we hope they *were* thinking functionally! We don't need an experiment to figure this out. The students singing in "fixed do"—or any of a hundred different naming styles—could have been thinking functionally too. Why not use a system—like "moveable do" or numbers—that will actively force them to do this in the first place instead of making them overcome the inherent limitations of non-moveable approaches (*aka* inflexible, non-functional methods). In addition, the authors comment that many students sang correct notes but with the wrong labels—further proof of the frequent mismatch between what comes out of the mouth and what is going on inside the head.

This points out, by the way, the folly of Study #4, which compared "moveable do" with numbers: they are, in fact, the same thing!—two different labeling systems for *the same methodology* (scale-degree function). Again, the error of mistaking labeling systems for teaching approaches arises. Equally pointless would have been to compare "fixed do" with letter names (also identical systems, although intervallic ones in this case).

5. Nothing I've discussed up to this point in my review is really controversial among most serious teachers of sightsinging—and I stress the word "serious" here. In other words, there is nearly universal agreement about the superiority of *scale-degree function* (regardless of the names put to the notes) for the kind of tonal music that is the foundation of most undergraduate aural-skills programs. [The pentatonic and modal repertoire associated with the Kodaly system is another matter.] The reason for this is simple and it has nothing to do with teaching style, preference, or background experience. The argument would be made on musical grounds, not on pedagogical or philosophical grounds.

The reason for the superiority of scale-degree function is because it is the perfect match—a parallel system—for how tonality itself actually works: tendencies and aversions of pitch patterns work for or against the possibility of particular notes assuming tonic status. Activation—or denial—of latent potentiality is what tonality is about. Fetis, the 19th-century theorist, was the first to make this understanding explicit. *We should be getting our clues and signals for teaching sightsinging, then, from the structure of music itself, not from the kind of empirical research represented in this article.* I am, therefore, in basic disagreement about the whole premise and value of this experimental approach. To me it is a dead-end street.

6. The final proof to me that the authors have not sufficiently thought through the ramifications of their approach is that some of the real controversies of sightsinging regarding solfege methodology are barely alluded to. One example is the so-called problem of "do-based" vs. the "la-based" (or Kodaly) systems of singing in minor ("do-re-me" vs. "la-ti-do"). Perhaps an experiment involving that comparison would have been more revealing. But, of course, the same problem of not actually knowing what was going on in the student's mind and ears during the act of sightsinging would still remain. I don't see any way around this problem. I think it is just a basic design flaw of the research methodology. The names a student uses when sightsinging may or may not correspond to the actual grooves that you want your students' hearing to be channeled into.

I won't get sidetracked discussing the "pros" and "cons" of singing systems for minor since the authors do not open this can of worms. I will mention, however, that the series of articles in this journal by Tim Smith[3] is definitive, in my opinion—and he argues, notice, from musical/structural grounds, not empirical research. The authors compare, in their introduction, the wealth of publication about sightsinging based on musical arguments with the paucity of research based on empirical research. Perhaps there is a lesson to be learned from this statistic. Perhaps we now can understand why not many experiments are done: they are not very revealing.

Appropriate design, in my opinion, for a proper empirical research study—if one is needed at all—almost demands interviews with students after their performance (or perhaps some kind of running commentary, with brief stops and starts, during the performance) so they could discuss how they were hearing and judging where the next pitch was. How did they find their bearings? What were they thinking or feeling? How did they recognize mistakes or get back on track? And so on. This could be fascinating and meaningful.

Gary Potter (Indiana University) used this method (called "naturalistic inquiry") very effectively for research into dictation strategies.[4] And this is how research into strategies for how grandmasters make good chess moves has been done as well. Frequently, these expert chess players, who were interviewed while they were

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[3]See Michael Houlahan and Philip Tacka, "Sequential Order for the Preparation, Presentation, Practice and Evaluation of Rhythmic and Melodic Concepts," *Journal of Music Theory Pedagogy* 4/2 (Fall 1990); Timothy A. Smith, "A Comparison of Pedagogical Resources in Solmization Systems," *Journal of Music Theory Pedagogy* 5/1 (Spring 1991); Micheal Houlahan and Philip Tacka, "The Americanization of Solmization: A Response to Timothy A. Smith," and Timothy A. Smith, "The Liberation of Solmization: Searching for Common Ground," *Journal of Music Theory Pedagogy* 6 (1992). [The authors of "To Doh . . . ," by the way, only cite a portion of the debate with Houlihan and Tacka in their references.] This complete series of articles is by now so well know in theory pedagogy circles that I imagine most teachers have the references memorized.

[4]See Gary Potter, "Identifying Successful Dictation Strategies," *Journal of Music Theory Pedagogy* 4/1 (1990): 63-71.

playing, could not say why they made a certain move ("it intuitively felt right" was a standard response). This different and more subjective research paradigm that values trustworthiness, credibility, transferability, dependability, and confirmability over the more traditional objective virtues of reliability and validity (mentioned in my opening paragraph) is what would be required, I believe, for meaningful results to be produced. I am not saying that quantitative research is never of any value in doing research—only that, in this particular case, the qualitative approach may shed more light.

Potter does a masterful job of summarizing the merits of this approach and I quote (and sometimes paraphrase) from his article here:[5]

a) Naturalistic research should be done in its natural setting, not in a lab setting. Perhaps students could be tested in the place where they practice their sightsinging.
b) Data gathering and interpreting are done better by humans than by machines. We should gather data with our individual prejudices, strengths, and shortcomings influencing what we regard as important. To have a bias is not necessarily an undesirable thing.
c) Intuitive knowledge should be valued at least as highly as knowledge expressible in language or numbers. We should not merely record data but will pursue hunches and encourage responses which we feel to be important or useful.
d) Qualitative methods should be at least as valuable as quantitative. Relatively little of our data should be numerical.
e) Sampling should not be random but purposeful. We should choose subjects carefully. We do not wish to study the average musician but rather the expert. We should focus on those who sightsing particularly well (perhaps regardless of their specific methodology) and not just routinely test an entire class.
f) Data-analysis should be inductive rather than deductive, retaining the rich multiplicity of the data, exposing mutually

[5]Also see Yvonna S. Lincoln and Egon G. Guba, *Naturalistic Inquiry* (Sage Publications, 1985), pp. 39-44, which is the original source that Potter draws from for his work.

influencing factors. We should not try to boil experience down to a few sightsinging "rules."

g) Our interpretational theory should arise from the data itself; the research is not conducted to prove or disprove a hypothesis (or a particular labeling system for sightsinging). Our question should be: how do experts sightsing? We will observe and find out.

h) Even the design of the research project itself should emerge from the data and might change as it goes forward. We do, however, have budget and time constraints; within these there is considerable flexibility.

i) Human subjects should have a voice in interpreting data about themselves. We should constantly be urging them to confirm or disconfirm what we think they are doing.

j) The research findings should be presented in a lengthy, inclusive "case study" format rather than in a summary which "averages away" some of the interesting aspects of the data. We should prepare the case study with input from all involved.

k) Generalization should be avoided.

l) Applications to other settings should be necessarily tentative.

m) Boundaries of the inquiry should emerge as research progresses. Width of focus should be indeterminate. We should continue until time and money run out.

I respectfully propose to the authors and to other interested researchers that the above model (based on Potter's dictation study but adapted here for sightsingers) would reveal more about how we should be teaching sightsinging than the kind of further studies suggested in the authors' concluding "Future Research" section, which would only recycle the same kinds of mistakes that I have already painstakingly identified in my review.

The understanding of sightsinging and its research requirements represented in this article are just too simplistic. Ironically, the authors have proven my case for me, but without realizing it. It truly may *not* matter what labeling system is used, as they say. But this is true *only if you are hearing "in the right way."* Hearing in the right way, for me, means hearing all the powerful implications, ambigu-

ities, and projections of the wonderfully rich and varied system of relationships that makes up functional tonality—that network of attractions, spoken about earlier, that defines the keynote as central and prior to all the others.

Thoughtful teachers will eventually have to decide what hearing tonal music *in the right way* means to them—and that has to consist of something more than matching, in pitch accuracy, to the answer key on a sightsinging test. As I say at the end of my Jersild article, "A sightsinging teacher should be more than an alarm bell for wrong notes." But the question of "how to hear tonal music" cannot easily be answered by the type of experiments identified in this article. The simultaneously simple and profound answer, of course, is that you must hear it *tonally* and *musically*—with all that implies. Regardless of one's individual answer to this basic question, however, once a detailed response is articulated, then you must choose your methodology accordingly—the appropriate teaching approach will be revealed from that considered reflection. Pedagogical choices should always flow directly out of thoughtful stances toward how music works. Music itself is our textbook and our best teacher for its own study. We only have to listen to what it tells us and be sensitive to its variegated shadings of pitch meaning.

Response to Roger's Review of: "To *Doh* or Not to *Doh*"

Mary Jo Lorek & Randall G. Pembrook

In his review of our article "To Doh or Not to Doh" Michael Rogers raises a very important pedagogical philosophy that is absent in the context of our paper. He states that there is 'nearly universal agreement about the superiority of scale-degree function,' in the teaching of sightsinging. We wholeheartedly agree that students should be able to distinguish functionality of the pitches within the tonal system, in order to be successful at inner hearing, tested as sightsinging. Instructors who participated in the various studies were also convinced of the importance of this pedagogical cornerstone. However, teachers who were teaching a non-movable syllable system conveyed this information without using solfege syllables or numbers, instead using terminology such as the `*seventh scale* degree' or the '*leading tone.*'

There is obviously *not* universal agreement about the superiority of a particular syllable system to accomplish this end. Rogers suggests, and one would expect, that using a movable system such as *movable* doh or *numbers* would encourage students toward functional 'thinking' more than systems such as *fixed doh* or *inflected letter names*. We have found through experience that movable syllables actually hinder some students, who might already possess a thorough knowledge of all keys, and thought processes for successful pitch orientation. Teaching a particular system does not necessarily aid a student toward functional thinking.

If a teacher can impress students with the idea of how tonality works and how they can hear what they see (C-D-E-F as either a beginning or an ending) then it does not matter what they 'say.' Whether to use movable, fixed, or a neutral syllable has already been much debated (see Bentley, Multer, Smith, Houlahan and Tacka,

Larson). The advantages of each system may be different, but the purpose is the same, namely, to facilitate sightsinging. Even within movable systems, *movable doh* and *numbers* are not the same thing. For the inexperienced freshman sightsinger *movable doh* requires an extra step cognitively. After identifying the fifth scale degree in a particular key, the student must convert the number information to the syllable *sol*. The same extra step would be involved in learning *fixed doh* as opposed to *inflected letter names*..

The reviewer insists on musical responses, downplaying the importance of 'correct' notes. It is widely recognized that the skill we are trying to teach and assess is inner hearing using the only physical test available – singing. For some people this manner of testing is less than ideal. (One of us once had an excellent sight-whistler.) In fact, we *are* interested in the correct notes as an indication of an inner understanding of the sound of the written music. Since we cannot electronically probe their brains, we must rely on their voices. Sightsinging class is a perfect avenue for conveying the inner workings of tonality, but the goal is an accurate performance. Of course, we would want our students to exhibit accuracy *and* musical nuance, but nuance depends upon accuracy. Our experiments were designed to test the end result, namely, accuracy of a sightsinging performance.

This paper details numbers and accuracies, by which we deduce that in a group, syllables do *not* necessarily help, in fact may hinder, a successful rendering of what may be 'heard' in the brain. The study is all about syllables, and indicates that perhaps we should not put so much weight on them. Some students really succeed with movable doh. Others never catch on to syllable names yet seem to understand sightsinging just fine. Students could be given a palette of systems from which to choose, in the style of discovery learning, assimilating whatever 'words' suit their experience, understanding, and ability.

Rogers's call for interviewing subjects is a valid and much needed research tool. We have conducted qualitative studies also[1] and found the information to be most helpful in influencing our

[1]"A View of Ear Training Pedagogy form the Students' Perspective," presented at Music Theory Midwest, May, 1997, in Northfield, MN.

pedagogy. However, the results of qualitative research often do not represent the whole population. Rogers obviously values qualitative research over quantitative. We value both. Empirical research provides answers which are most applicable to a random group, those we might see each fall. While we all desire to teach the brightest and most musical students, we are employed to impart our knowledge to all. If many of our entering freshmen did not struggle so with *movable doh*, we would never have initiated these experiments. And, while *movable doh* may be easier for the instructor to convey the concept of functionality, because of its foreign-ness to the 18-year-old, it may not be the easiest method for that student to grasp.

Michael Rogers rightly asserts that sightsinging is certainly not about fussing over what to call each note. In fact, our study says just that. In light of the fact that syllable systems did not significantly improve any group over another, why insist that students all use the same system, functional or not?

Competing Analyses as Pedagogical Strategy and Hugo Wolf's *Das verlassene Mägdlein*

Gordon Sly

As a young graduate student I was fortunate to have worked with Christopher Lewis, whose untimely death in the fall of 1992 took from us a gifted scholar and a devoted and imaginative teacher. One particularly effective classroom technique that he developed involved teaching a piece from very different—even opposing—perspectives in successive class meetings. On Monday he would work through an analysis of a piece, challenging students and drawing them into the process in his usual way. The analysis itself may have been his own, or it may have been taken from the professional literature, in which case the class would have been given a preparatory reading assignment. On Wednesday he would enter the classroom wondering aloud just what may have lead him to develop, or to accept, the misguided views with which he had burdened us on Monday. In any case, he was happy to report that sometime early Tuesday morning he had come to his senses, and that the next hour would be given over to setting things right. He would then carefully lay out the argument for an entirely different analytical stance, and proceed with the new analysis. Friday's class, the final stage in a three-class process, would provide for a discussion of the events of the previous two meetings, and a clarification and examination of the issues raised. Importantly, while Wednesday's class would always have begun by pointing out the serious shortcomings of the views presented on Monday—these shortcomings were, after all, what necessitated the second account to follow—Friday's review would not necessarily hold to this judg-

ment. With one piece it may have, but with another the class may have concluded that the indictment of the first analysis had been hasty, and that the second account, being largely a reaction to that inaccurate judgment, was actually more flawed than the first. Or, more typically, it may have been decided that both analyses contributed valuable insights.[1]

A favorite piece for this treatment was Chopin's Prelude in E minor, op. 28, no. 4, which he would teach to spring-semester sophomores. The first class would concentrate on its thoroughly chromatic surface, and on the wealth of sonorities produced by the descending lines. Was the piece really "tonal," as we had come to understand that term? E minor asserted itself at cadences, but surely the real interest in the piece—what the music was really "about"—lay in the great variety of chords it presents, and in the relationships among the various tonal centers implied by these chords. Would an analysis not best reflect this striking feature of the work by regarding the role of E minor as secondary, if not peripheral? A convenient means of articulating the work's form, perhaps; even a simple concession to tradition.

The second class (following the early-hour enlightenment) focused on the basic voice-leading of the piece, uncovering the simple harmonic progression that is embellished by the chromatic descent of each voice. Now the various sonorities whose harmonic implication had occupied center stage on Monday were understood to result from the coincidence of chromatic passing tones; and if these

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[1]A variation of this procedure involved a second teacher-another faculty member sitting in on the class as a guest, or his teaching assistant, who would be "provoked" by Professor Lewis's analysis into presenting the second viewpoint on the piece. During the last minutes of Monday's class, the co-conspirator would express strong dissatisfaction with Lewis's whole take on the piece. Lewis would demand to know what might be proposed in its place. His colleague would, of course, require a little time to put a few ideas together, but would be prepared to set forth an alternate view on Wednesday. Lewis would agree and dismiss the now quite startled class without another word. On Wednesday the contrasting interpretation of the piece—which the two of them had rehearsed on Tuesday—would be given. Lewis would sit stoically through the presentation, noting ideas to be addressed at Friday's postmortem.

were passing tones, then their combination formed passing chords. The function of each tone and chord was examined, as the basic harmonic motion that supports the opening section of the piece was brought into focus: the initial progression from i^6 to iv^4_3 in m. 5, the motion within the subdominant harmony that leads to iv^6 in m. 9, and the arrival in m. 10, and extension through m. 12, of V. Example 1a provides the opening twelve measures of the piece;[2] Ex. 1b gives my own illustration of this voice-leading and harmonic organization.

Professor Lewis's success with this pedagogical strategy owed much to the passion and remarkable powers of persuasion he brought to his teaching. His classes, like anyone's, were comprised of the usual array of students: several bumps on logs from whom no teacher could pry anything; the gang in the middle who enjoyed his enthusiasm to varying degrees and picked up on some of what he said; and the keen few at the top who hung on every word. This group would leave Monday's class excited, imbued with a zeal to explain to anyone who would listen how Chopin was an unappreciated forward-looking composer—even the first post-tonal composer. Wednesday's class hit these students hard, and taught them a number of important lessons. Most obviously, it became clear that two convincing and yet contradictory analytical accounts of a piece were possible. The experience also taught them to approach analytical explanations with a measure of skepticism, and to consider carefully the assumptions upon which an analysis rests. For their own work, they learned that any analytical approach carries specific implications and constraints—that analytical claims have consequences. Each of these lessons is valuable, but none more so than that noted last, since the work of young students is troubled most persistently (beyond the pervasive and lamentable inability to express their ideas, that is) by arbitrary and unsupported—and usually insupportable—analytical decisions.

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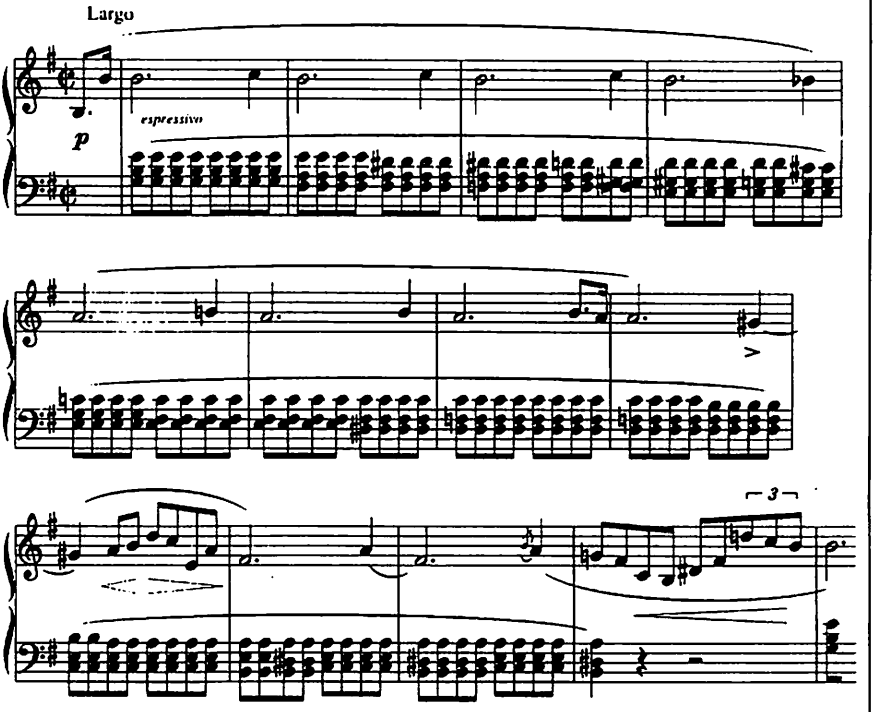
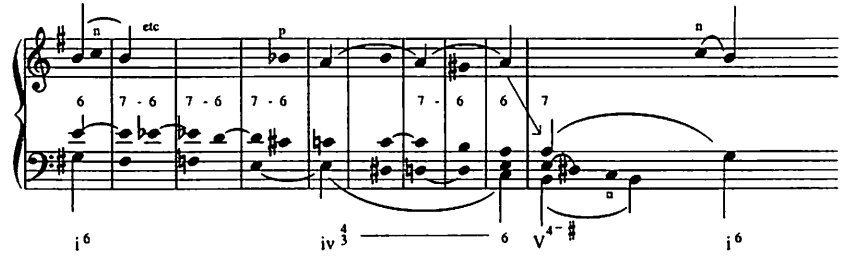
[2]The complete piece can be found in Charles Burkhart, *Anthology for Musical Analysis*, 5th ed. (Fort Worth: Harcourt Brace College publishers, 1994): 329. It is also available in *Complete Preludes and Etudes for Solo Piano, Frederic Chopin* (New York: Dover Publications, Inc., 1980): 5.

Example 1a: Chopin, Prelude, op. 28, no. 4, mm. 1-12



Example 1b: Chopin, Prelude, op. 28, no. 4, mm. 1-12, Voice-Leading and Harmonic Structure



Each time I was privileged to observe Professor Lewis's implementation of this pedagogical technique, and its subsequent effect on students' own analytical work, my resolve to borrow the idea for my own teaching deepened. In the years since, I have used it with sophomores, juniors, and even graduate students. I have also found my own favorite piece for this approach, which is the subject of the balance of this essay.

Hugo Wolf's setting of Eduard Mörike's *Das verlassene Mägdlein*[3] is a beautiful and fascinating work, and has received a good deal of analytical attention, particularly in the classroom, but also in the professional literature. The song amply repays this study: its modest scale and marked simplicity of gesture do not diminish its richness—even its daring novelty—in the use of the extended tonal practices that characterize late-19th-century music. It is chiefly the remarkable central part of the piece, and its role within the larger context, that invites different interpretations, and, therefore, the pedagogical treatment described in the foregoing pages.

The following overview of the music's organization sets that larger context. The song is cast in a straightforward ABA design with principal divisions at mm. 13 and 38. The music's tonal center is also clear: despite the avoidance of a complete or unalloyed tonic triad to begin any of the opening section's three phrases, the dominant harmonies that punctuate each phrase, and the stepwise descent that shapes the vocal line, establish A minor as tonic. The closing section, which is built from the second and third phrases of the opening music followed by a cadential gesture, reconfirms A minor.

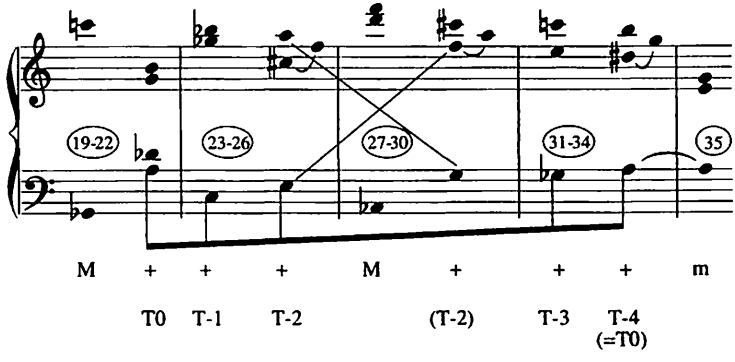
The relatively large central section, however, very much stands apart tonally, being essentially controlled by a series of augmented triads. The passage is ushered in by the A-major triad in m. 13, which simultaneously responds to the dominant harmony of the previous measure, and introduces the new sound of the "B" sec-

[3]Like the Chopin prelude, this piece can be found both in Burkhart (pp. 394-396) and in a Dover edition (*The Complete Mörike Songs, Hugo Wolf* (New York: Dover Publications, Inc., 1982): 20-21).

tion. Paradoxically, this first chord of the new section represents the complete tonic triad for which the opening music had been searching, albeit a modally altered one. The A-major triad alternates through mm. 13-18 with a Mm$\frac{4}{2}$chord built on C♯, that is, with B as its bass tone. In mm. 19-22 an A♭-major chord alternates with the first of our augmented triads, built above this same B in the bass. The next twelve measures are ruled by the augmented triad: the only relief from this sonority is provided by the B♭ major chord that alternates with the augmented triad above an A bass through mm. 27-30. These bars are framed by four-measure passages, both of which move between two augmented triads, built, respectively, above bass tones of D and F, and A♭ and B. The augmented triads from first to last, then, are supported by bass tones that proceed through the chain of minor thirds: B ascends through D and F and then continues through A♭ and B (I have ignored A♮ in this progression, since it represents a continuation of the augmented triad built on F). This motion carries the augmented triads through their complete transposition cycle in descending semitones. This is illustrated in Example 2 with the labels T0 (or "transposition 0"), T-1 ("transposition minus one"), T-2, T-3, and on to T-4, which, of course, is the same triad as the T0 point of departure. Only here, at mm. 35 ff., does the augmented triad loosen its grip on the music.

The augmented triad is a relatively rare event in tonal music. When it does appear, its function, like that of any chord, is determined contextually. Three occurrences are shown below in Example 3. Most frequently, the chord is produced by an ascending chromatic passing motion that issues from the fifth of a major triad. This alteration destabilizes the triad and urges resolution, normally to a major chord whose root lies a fifth below the root of the augmented triad, with the chromatic ascent leading into the chordal third (Example 3a). Resolution to a triad up a major 2nd is also possible, though less common. Here the chord of resolution is usually minor, and invariably in first inversion to avoid the parallel fifths that would otherwise result (Example 3b). The augmented triad also arises through chromatic embellishment of a single major or minor chord, as in the opening of Brahms's Alto Rhapsody (Example 3c), where an appoggiatura to the root of the initial C-minor tonic harmony creates a striking effect. Other specific voice-leading con-

Example 2: Wolf, *Das verlassene Mägdlein*: Series of Augmented Triads in the Central Section



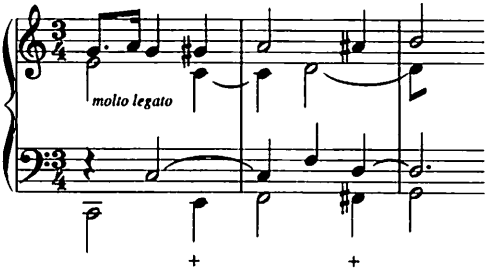
texts are possible, but all share the same basic features: the augmented triad arises as an elaboration of a major or minor triad; it is highly unstable and resolves locally.

Wolf's use of the chord in *Das verlassene Mägdlein* departs substantially from this usual function. Here augmented triads do not appear to arise as alterations of major or minor triads. Nor do they resolve to consonant sonorities. In fact, they seem not to resolve at all; for the most part, as we have seen, augmented triads move into other augmented triads.

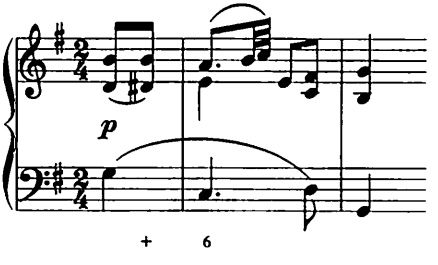
This most unusual feature of the work, then, gives rise to our analytical fork in the road. The first reading, while acknowledging the odd behavior of the augmented chords, nevertheless holds firm to the implications for interpretation of this passage carried by the song's being "in A minor." If the piece is tonal, then the workings of these augmented chords must be understood within that larger tonal context. As a dissonant sonority, the augmented triad necessarily arises from, and therefore embellishes, some consonant element. This line of reasoning forms the analytical point of departure for the initial class. In recent years, I have asked students to read James Baker's brief essay on the piece, taking advantage not only of Baker's thoughtful account of the music, but, in preparation for

Example 3: Typical Contexts for Augmented Triads in Tonal Music

a) Beethoven: Bagatelle op. 119, no. 8

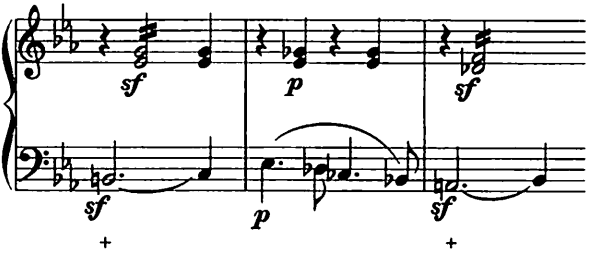


b) Beethoven: Six Easy Variations on an Original Theme, WoO 77, Tema



c) Brahms: Rhapsodie, Op. 53

Adagio



Wednesday's contrasting approach to the piece, the authority that for most students attaches to a published analysis.[4] Baker's interpretation, illustrated below in example 4,[5] proceeds from the assumptions we have described. The crux of it, shown clearly in the bass and harmonic analysis, hears the A♭-major triad of m. 19 and the B♭-major triad of m. 27 as locally stable events. Specifically, the B♭ triad is a root-position Neapolitan that connects the opening tonic to the structural dominant of the closing measures. Baker suggests in the commentary that the A♭- and B♭-major chords act as a kind of composed-out chromatic-neighbor motion to tonic A. This observation must be qualified in class, since, as just noted, the example shows the dominant, not the tonic, as the goal of the B♭ harmony. The characterization of a double-neighbor around the tonic, then, with its implication of a large A-A♭-B♭-A bass motion, would be misleading. One may perhaps say that the Neapolitan arises as the upper member of an *incomplete* chromatic double-neighbor motion flowing out of the song's opening tonic harmony.

In any case, what is chiefly important for us is that the augmented triads, marked "+3" in the example, are heard as subordinate, as elaborations of these major triads; essentially, they are understood to arise as part of the connective voice-leading tissue within the structural frame of the song's broad bass motion. While the augmented triads do not act, then, just as they do in the passages given in Example 3, still, that view of their origin and function—as embellishments of local consonant triads—remains a basic assumption of Baker's analytical position. This interpretation of the augmented triads as dissonant—that is, unstable—elaborations of the stable major triads that anchor the passage is the centerpiece of this analytical conception of the music.

The second class is set in motion by my expressed nagging dissatisfaction with the thorough de-emphasis of the augmented triads that characterized the first analysis. The augmented chords are

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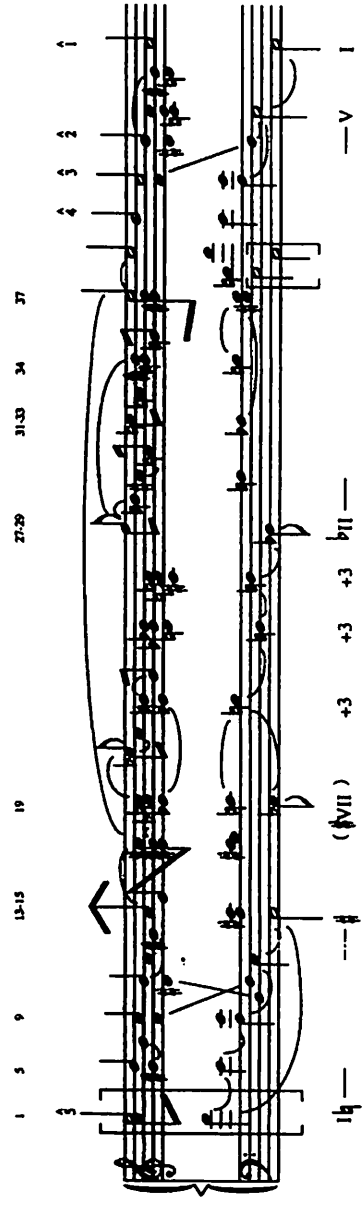
[4]See James Baker, "Post-Tonal Voice-Leading," in *Early Twentieth-Century Music, Models of Musical Analysis*, ed. Jonathan Dunsby (Oxford UK: Basil Blackwell Ltd., 1993): 20-41. Baker's discussion of *Das verlassene Mägdlein* is found on pp. 21-25.

[5]Baker's sketch is given in Example 2.1 as Ibid, p. 23. Example 4 follows Baker's reading, but does not reproduce all of the details of his sketch.

Example 4: After James Baker's Sketch of *Das verlassene Mägdlein* in "Post-Tonal VoiceLeading," *Early Twentieth-Century Music: Models of Music Analysis*



so prominent that dismissing them as incidental byproducts of the voice-leading seems musically unconvincing. If, as one could argue, their sound largely defines the song, an analysis should accord them a status that reflects that quality. At the same time, that A minor is the cohering tonal force of the piece is undeniable, and the origin and dissonant function of the augmented triad in tonal music is clear, as we have seen. The dilemma, then, is plain: reconciling these two seemingly incompatible ideas, a consonant, or stable, augmented triad within a tonal context, is an inescapable requirement of any seriously competing interpretation.[6]

Mörike's poem describes a scene: we see a young girl, early in the morning, stand before a fireplace and light a fire; we see her staring into the flames. What we see next are tears. Between the gazing into the fire and the appearance of the tears has occurred her recollection of a lover who, it would seem, has abandoned her.

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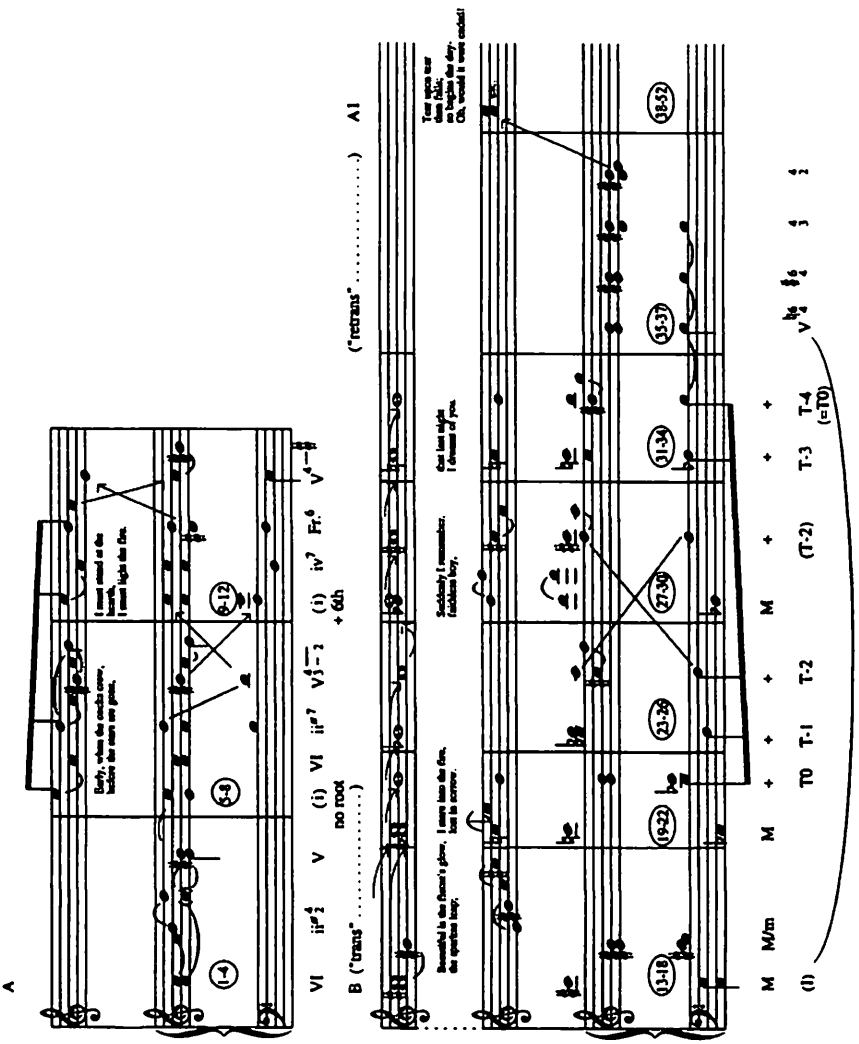
[6]A number of studies have addressed this idea of normally dissonant constructs being rendered consonant by context in certain nineteenth-century works. Robert P. Morgan's "Dissonant Prolongation: Theoretical and Compositional Precedents," *Journal of Music Theory* 20 (1976): 49-91, and Howard Cinnamon's "Tonic Arpeggiation and Successive Equal Third Relations as Elements of Tonal Evolution in the Music of Franz Liszt," *Music Theory Spectrum* 8 (1986): 1-24 examine the issue thoroughly, and present a number of excellent examples. Both authors show the opening section of Liszt's well-known *Faust* symphony to be based on the prolongation of the augmented triad A♭-C-E. Cinnamon goes on to examine in detail the relationship between the introduction and the tonal architecture of the rest of the work. The issue is explored in the context of three songs by Wolf (*Das verlassene Mägdlein* is not among them) in John Williamson, "Wolf's Dissonant Prolongations," in *The Second Practice of Nineteenth-Century Tonality*, ed. William Kinderman and Harald Krebs (Lincoln and London: University of Nebraska Press, 1996): 215-236. Three articles from a recent issue of *Music Analysis* also speak to this general question. See Richard Cohn, "Maximally Smooth Cycles, Hexatonic Systems, and the Analysis of Late-Romantic Triadic Progressions," *Music Analysis* 15 (1996): 9-40, Linda Popovic, "Liszt's Harmonic Polymorphism: Tonal and Non-Tonal Aspects in *Héroïde Funèbre*," *Music Analysis* 15 (1996): 41-55, and Mark Anson-Cartwright, "Chord as Motive: The Augmented-Triad Matrix in Wagner's *Siegfried Idyll*," *Music Analysis* 15 (1996): 57-71. For a broader discussion of Wolf's harmonic practice, see Deborah J. Stein, *Hugo Wolf's "Lieder" and Extensions of Tonality* (Ann Arbor: UMI Research Press, 1985).

The poem, then, moves between two distinct planes of action: her observable, physical action; and the unobservable action of her mind. The underlying idea of this second interpretation is that the augmented triads are the central feature of Wolf's musical interpretation of the poem. In brief, Wolf uses the augmented triads to depict the poem's chronological disruption—to suspend tonal process itself, in order to reflect the suspension of the poem's observable, in-time action, and to set the out-of-time action that takes place in the girl's mind.

In Example 5, the opening and closing passages of the "B" section are characterized as "transition" and "retransition," respectively. What these terms denote here are transitions into and out of this state of suspended tonal process. The opening measures of the section set the poem's second stanza, as the girl gazes into the flames. The next line of text is from the poem's second plane, the unobservable action of her mind. How does Wolf move *musically* from one plane to the next? The initial harmonic progression of the "B" section, as we have observed, is from an A-major triad to a Mm7th chord on C♯. In a sense, it is meaningless to view this latter chord as V^7/♯VI since F♯ nowhere asserts itself as a point of tonal focus, neither locally nor in any more global sense. However, it is precisely this that underlies its presence here. A dominant-seventh chord is strongly suggestive of a specific tonic. Wolf exploits this quality to begin a process of loosening the sense of tonal center. The chord pulls away from A as tonic, but suggests a tonal potential that is not realized, thereby causing the tonal center to begin to go out of focus.

The $C♯^7$ chord also supports the tone G♯ in the highest sounding voice. This brings out the chromatic descent from tonic A, the bass tone of the preceding A-major triad. This interval, the falling halfstep, is really the defining idea of the section. It guides virtually all harmonic motion: the A-G♯ of the initial progression; at a slightly broader level, the fall from the A-major chord of m. 13 to the A♭-major chord of m. 19; another halfstep descent from that A♭ triad to the first of the augmented triads; and finally the progression of augmented triads through the section (these motions are summarized using arrows in the staff appended above the three-staff system in the lower section of example 5). The falling semitone portrays mu-

Example 5: Wolf, *Das verlassene Mägdlein*: Tonal and Formal Organization



sically the descent into the trance-like state induced by the gazing into the flames. The hypnotizing effect of the fire carries the girl from the reality of the world to that of her memory. Musically, the A minor of the opening section is made hazy by the series of harmonic events beginning in m. 13, and a new reality of parallel augmented triads emerges. Each of these events is arrived at by chromatic descent. The passageway from one reality to the other, then, is the descending semitone. One might say that the trance-state is assigned a metaphorical location a halfstep below that of the observable world.

This interpretation illuminates the B♭-major chord of m. 27, revealing a moment of rare poignancy. This is the chord that appears in the midst of the series of augmented triads. The motion into the root of this chord is *up* a semitone. The B♭ triad sets the word *plötzlich*, suddenly, indicating the moment of recollection. Here, then, we have reality—as represented by the metaphorical location up a halfstep, and by a *major* triad—encroaching on the daydream, for it is this memory of a real event that is the source of her sorrow. Musically, rather than functioning as a stable point of resolution or object of prolongation by the surrounding augmented triads, this major triad is subsumed within the span *controlled* by the augmented chords, and derives its meaning from that context. Viewed in this way, Wolf's detailed mirroring of the poem's levels of action in his manipulation of tonal materials is quite remarkable: the girl's trance-state interrupts the unfolding of her day, but internal to the trance is reality once again, the recollection of a real experience. Simply put, reality subsumes dream, which in turn subsumes reality. In Wolf's setting, the tonally disorienting augmented chords of the central section interrupt the unfolding of a piece in A minor, but internal to this section is a tonal event once again, the B♭-major triad. Simply, tonal process subsumes tonal disorientation, which in turn subsumes tonal process.[7]

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[7]This apparent paradox of a normally consonant event (a major or minor triad) serving as a prolongational agent of a normally dissonant event (the augmented triad) was noted by Morgan in the context of the *Faust* symphony introduction ("Dissonant Prolongations," pp. 60-61):

Wolf is able to use the augmented triad to arrest tonal process because, used in this way, it carries no diatonic function and, therefore, provides no sense of tonal priority. In other words, the relative contextual autonomy that results from this extended motion among augmented triads erodes the dissonance—the instability—that normally attaches to the chord. In its place, the symmetry of the triad itself is asserted, resulting in a passage that is singularly resistant to tonal allegiance. Further, that Wolf carries the music through the chord's complete transposition cycle—that its terminal points are the same augmented triad above bass-tone B—underlines the chronological disruption, the state of suspension, that the passage portrays. Wolf has managed musically to put the listener through an analogous experience to that which the poem's character endures. As we listen to the poem's third stanza, we are in a dream right along with this girl, utterly adrift tonally in this wash of augmented chords. Our disorientation sets us up for the remarkable retransition of mm. 35-37. This is truly a wonderful moment in the song, as Wolf restores tonal process—and our bearings—only gradually. First, the symmetry of the augmented triads is broken by the minor ♯chord; then G becomes G♯, providing a major triad on E; and finally D is introduced, which, with G♯, produces the unequivocal dominant function that revives our tonal focus. The girl, meanwhile, has broken through the flame's hypnotizing grip, and reemerged into the misery that is her reality.

"C-E- A♭ is always present as a referential sonority. But within this basic framework there are both passing chords (e.g., mm. 1-2) and neighbor chords (mm. 4-5), as well as a number of non-harmonic tones. The latter are interesting in that they occasionally create the appearance of stable harmonies. Within the context of this section, however, they are neither stable nor even true harmonies, since they result from secondary voice-leading motions. For example, the "minor chord" in m. 5 results from the suspension of the C-sharp in the top voice. Although the real meaning of these "chords" is perhaps clear enough within the relatively simple closed system established by Liszt, such *Scheinharmonien* [apparent harmonies] often occasion misreadings. Their structural meaning is here determined entirely by contextual means unrelated to (in fact, running directly counter to) the conventions of the tonal system."

Each time I have used this technique to teach the piece, I have found in Friday's class that students are most interested in discussing which reading, Monday's or Wednesday's, is the better one. The first time I experienced this, feeling that this was really not the important question, and that the students were not equipped to make that judgment, in any case, I tried to shift their focus to other issues, with very limited success. More recently, I have accepted that this is what engages them, and tried to inject into that discussion some of the issues noted earlier, those of maintaining a degree of skepticism and considering carefully the assumptions upon which an analysis rests, of recognizing the implications carried by analytical claims and approaches, and the importance of remaining consistent to those implications. Another idea that always emerges is the acknowledgment that an analysis, among other things, suggests a way of hearing a piece. As self-evident as this may seem, it nonetheless comes as a revelation to many students. And rarely does the opportunity exist to demonstrate this idea so dramatically as it does here. For to listen to this song alternately from the perspectives described by the two analyses is almost to experience two different works. In the end, perhaps this idea, that analysis of a piece—that *thought* about a piece—influences our experience of music, is the most important lesson students will take away with them.

Welcome to Theory Camp! More Than Simple Remediation

Jeff Gillespie

Instructors of music theory would undoubtedly concur that in the first stage of training in music theory a student should gain an understanding of fundamentals, which commonly include topics such as pitch reading in various clefs, scales, key signatures, intervals, triads, plus the basics of rhythm and meter. Michael Rogers calls fundamentals the "foundation for all further tonal study."[1] He warns that "a superficial grounding in the basics elements of pitch will cause more problems later on than almost any other form of negligence."[2] To gain mastery or fluency in fundamentals, Rogers divides the study into three stages: "understanding the concept behind a topic, developing accuracy through practice, and developing speed."[3] Indeed, mastery of fundamentals is crucial in order to progress well in music theory, and parallels can be drawn with many other subjects including reading, learning a foreign language, algebra, chemistry.

Students who enter college as freshmen music majors come from a wide variety of musical experiences, and this is particularly evident when assessing their pre-college background in music fundamentals. The experience spectrum includes on one extreme a thorough grounding in music fundamentals and on the other a basic ability to read music in only one clef, with no knowledge at all of fundamentals. In between these extremes is found an assortment of experience levels that are often spotty or superficial in coverage. Because of such diversity, colleges are faced with the challenge of

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[1]Michael R. Rogers, *Teaching Approaches in Music Theory* (Carbondale, IL: Southern Illinois University Press, 1984), 36.

[2]Rogers, 34.

[3]Rogers, 35.

finding the best means of evaluating the theory background of incoming freshmen and the most effective way to remediate those students who are weak in the area of fundamentals.

To explore how other colleges and universities handle these issues on fundamentals, Eric Isaacson conducted a survey in 1998 that produced responses from 21 music schools and departments of varying sizes.[4] Of the 21 schools, 15 offer a "pre-theory rudiments" (fundamentals) course. Most of those 15 schools utilize theory placement exams, and a few use individual assessment tools, to determine whether students need to take the fundamentals course. A variety of responses was given to this question from the survey: "Approximately how many students take this course in a given year and what percentage of your total population does this represent?" (It is assumed that "total population" refers to total number of freshman music majors.) The percentages required to take a fundamentals course ranged from "less than 10 percent" to "the majority of our incoming students," with a fairly even spread of percentages in between. One variable that may have an influence on these percentages is the difficulty level of each school's placement exam. Another question that received a variety of responses is: "Approximately how many weeks are spent in the first theory course on teaching or review of fundamentals?" Responses ranged from "we assume knowledge of rudiments" to "the whole first semester is fundamentals," although the most popular response was "in the five-to-six-week range." Several common threads seem to permeate the wealth of responses to this survey: 1) The need for remediation exists in all the schools, 2) The problem does not appear to have an easy solution, and 3) There is an overwhelming desire from faculty for students to be better prepared in music fundamentals when they arrive as freshmen.

At Butler University, we have traditionally offered an "Elements of Music" course that covers fundamentals for those students deemed deficient in the subject, as a result of a theory placement

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[4]Highlights from this survey are provided here. Full survey results are found online: Eric Isaacson, *Music Fundamentals Survey: Summary of Responses* (Indiana University School of Music, Department of Music Theory, ©1998 by The Trustees of I.U.); available from *http://theory.music.indiana.edu/surveyresults.html*; accessed 19 June 2001.

exam administered on audition days. The exam covers the basics of rhythm and meter; pitch notation in treble, bass, alto, and tenor clefs; scales (major and all three forms of minor); key signatures; intervals; and triads. Roughly 25 percent of entering freshmen score lower than 50 percent on the placement exam, which requires them to complete the Elements of Music course before continuing on to the four-semester theory "core" sequence. All other entering freshmen spend four to five weeks on fundamentals at the beginning of the first theory core course. Until recently, Butler students needing remediation had one option, which was to take "Elements" during their freshman year and delay the start of the theory core until their sophomore year. Not only is this delay a curricular disadvantage, but it can be demeaning to the student to be set back a year and not join the majority of the freshman class in music theory. A solution was sought that would address this problem in a positive and productive manner. Because of the size of the institution, offering off-semester theory courses, or offering summer courses to help students catch up, were not viable options. Instead, the idea was explored for offering a 10-day version of the "Elements of Music" course, to be made available to entering freshmen shortly before the start of fall semester. Students who completed this intensive course could then begin the theory core at the start of their freshman year. This idea has now become an annual tradition since 1996 and is affectionately known as "Theory Camp."

The initial idea for Theory Camp originated with S. Kay Hoke, who states that "Even though we didn't call it Theory Camp as anything official, it came to be known as Theory Camp right away. Part of that had to do with the fact that what we were really giving students was an immersion experience in music theory."[5] Theory Camp is much more than a typical intensive course, however, and getting it off the ground initially required the cooperation and support of many people throughout the institution. Hoke garnered support for the idea from the Chair of the Music Department, the Dean of the College of Fine Arts, and most importantly the university's Of-

[5]From a personal interview with S. Kay Hoke on 27 June 2001. A former Professor of Music at Butler University, Hoke is currently Chair of the Division of Fine Arts and Department of Music at Brevard College.

fice of Student Affairs. With the cooperation of Student Affairs, at no additional housing charge, campers are able to move into the dormitory rooms that they will occupy throughout their freshman year, ten days before the rest of the students arrive on campus. They are also charged the summer tuition rate for the course, which is slightly lower than the regular year's rate. The only additional expenses are for meals and textbooks for the course. According to Hoke, "Part of the reason it was able to happen was administrative support for the idea, and the fact that people had enough confidence to let us try it for a year to see what happened."[6]

Several aspects of Theory Camp make it a unique and memorable experience, both for students and instructors. The social activities during the evening hours, the team-teaching approach in the classroom, the highly-focused classroom goals, the relaxed atmosphere in the classroom, and the long hours spent together during the ten days all work together to create a special "bonding" experience for everyone that is remarkably similar to a camp experience. Each of these facets of Theory Camp will be highlighted here.

As illustrated in the sample itinerary of Figure 1, evening activities are scheduled that involve both campers and instructors. On the initial day of camp, two very important social activities take place. First, the Dean of the College of Fine Arts hosts a luncheon to welcome students, parents, and camp faculty. That evening a cookout or pizza party is held, with a representative from student services present to field questions about the campus and talk about issues ranging from safety, to fraternities and sororities, to city life. Since this is the first time most of these students have ever lived away from home, this evening session is a very special time for them. As Figure 1 illustrates, additional evening activities provide opportunities for students to have home-cooked meals prepared by faculty and sight-seeing adventures around the city. A highlight of the social events for both students and faculty is always the outdoor symphony concert and picnic, fully funded by the university. For some campers, this concert is the first symphony orchestra concert they have ever attended. In my own undergraduate experience, I was never invited to socialize with a faculty member until my jun-

[6]Hoke, personal interview.

ior year, so these opportunities for new freshmen to interact with faculty in social settings are very affirming and memorable activities for them. There are also several "free" evenings on the schedule, and occasionally, former campers will stop by the classroom and invite current campers to socialize with them on one of these free evenings. In addition, campers are allowed long lunch breaks that provide additional opportunities to bond and establish friendships while eating and completing lunchtime homework assignments.

All who have taught Theory Camp thus far maintain that a crucial ingredient for its success has been the team-teaching format, which has been utilized since the camp's inception. While I have taught every year thus far, my teaching partner has rotated among three other Butler faculty members, including Kay Hoke who was quoted earlier. Gail Lewis, another camp instructor, states, "One thing that impresses me about the team-teaching approach is that you can keep the students' interest throughout the ten days. Plus, it makes much more effective use of time for the instructors."[7] Spending five hours on intervals, for example, would make for a very long day for a single instructor. Plus, the students would soon tire of hearing from the same instructor for hours at a time. With two teachers, students get some variety in approach and personality. There are times when both instructors are present in the classroom for a lengthy period, and there are other times when one instructor leaves, either to make out a quiz, grade papers, design a worksheet, or simply take a break. Sometimes both instructors are in front of the class presenting material together, and other times one instructor presents material while the other circulates to give individualized help to students as needed. Having two instructors also provides opportunities to respond more quickly and directly to the needs of the whole class or to individual students. For example, one year approximately one-third of the class did considerably poorer on the rhythm and meter exam than did the rest of the class. For the next half-day following that exam, we divided the class so that those students who needed extra help in rhythm and

[7]From a personal interview with Gail Lewis on 28 June 2001. Lewis is Assistant Professor of Music at Butler University.

FIGURE 1. Sample Camp Itinerary

Wednesday, August 11	
9:00-11:45 AM	Move into Dorm Rooms
NOON	Lunch with the Dean for Parents, Students, Faculty
2:00-4:00 PM	Class: Pitch Notation, Intro to Computer Lab
5:00 PM	Cookout with Dean of Student Services
Thursday, August 12	
9:00-11:30 AM	Class: Notation of Pitch; Review and Quiz
1:30-4:00 PM	Class: Notation of Rhythm
Evening	Visit Museum of Art
Friday, August 13	
9:00-11:30 AM	Class: Notation of Rhythm; Review and Quiz
1:30-4:00 PM	Class: Scales and Key Signatures
Evening	Spaghetti and Ice Cream Sundaes at Instructor's
Saturday, August 14	
9:00-11:30 AM/1:30-3:30 PM	Class: Scales and Key Signatures
Evening	On Your Own (Carpool to Mall? Movie?)
Sunday, August 15	FREE DAY!! Possible Evening Activity!
Monday, August 16	
9:00-11:30 AM/1:30-4:00 PM	Class: Scales and Key Signatures; Review and Test
Evening	On Your Own
Tuesday, August 17	
9:00-11:30 AM/1:30-3:30 PM	Class: Intervals
Evening	Visit Observatory on Campus
Wednesday, August 18	
9:00-11:30 AM/1:30-3:30 PM	Class: Intervals
Evening	On Your Own
Thursday, August 19	
9:00-11:30 AM/1:30-4:00 PM	Class: Triads
Evening	Cookout at Music Dept. Chair's Home
Friday, August 20	
9:00-11:30 AM/1:30-4:00 PM	Class: Triads; Review and Final Exam
Evening	Outdoor Symphony Concert with Picnic

meter could receive help and then get re-tested on the material. If a student needs extra help outside of the regular class time, one instructor is able to meet with that student while the other instructor is preparing for the regular class period.

An added benefit of both the team-teaching format and the fast-paced nature of the course is that students are able to observe the teachers as they interact and respond to the needs of the class at any given moment. As students observe this on-the-feet planning, they become very aware of the depth of caring that is involved in teaching the class and in creating the best possible learning experience for them. It is truly an atmosphere in which all of us, teachers and students, are working collectively toward a common goal.

Within the classroom, the pedagogical goals are to achieve mastery of music fundamentals by focusing on Rogers's three "stages" of study, outlined at the opening of this article. Concentrating on fundamentals so intensely for ten days seems to increase the possibility for students to achieve mastery, perhaps more so than in a course taught during the regular year that meets three times a week for 50 minutes, along with all the other courses in a student's schedule. The textbook used for the course is the same text the students will use in the first two semesters of the theory core sequence. At present, that text is Turek's *Elements of Music*[8], which includes fundamentals primarily in its first three chapters. Instructors supplement the text with additional handouts and worksheets designed to fit the needs of the students. When introducing new concepts, we try to build upon what the students have already learned. For example, even though we do share "tricks" for remembering the ordering of sharps or flats in the key signatures, we spend a great amount of time learning the circle-of-fifths and how the various keys are related to each other. Once mastery is achieved with scales and key signatures, we move on to intervals by first relating them to the structures of the major and the natural minor scale. After intervals are mastered, we introduce major and minor triads, again building on the students' knowledge of the major and minor scales and key signatures. During the course of one day, we may first go over homework from the previous night, followed by more drill and practice

[8]Ralph Turek, *The Elements of Music*, 2nd ed. (NY: McGraw-Hill, Inc., 1996).

in order to improve on accuracy and increase speed, followed by a short practice quiz that will be graded quickly during a morning break. If additional help is needed, based on quiz results, we may continue with additional worksheets or simply answer questions from students. Only when the class is ready for a timed, graded quiz will we administer one. At various times during the course, we will include more comprehensive exams to tie various topics together. Though we are on a tight and accelerated schedule, we always allow room for flexibility, depending on the needs of the particular class. We do not move on to a new topic until the students are all ready to do so.

Though the basic concepts taught during the camp are pitch reading and notation (in treble, bass, alto, and tenor clefs), rhythm and meter, scales, key signatures, intervals, and triads, we do include extra material along the way. For example, we teach the scale degree names (tonic, supertonic, mediant, and so on), include various musical terms and definitions, and introduce movable "do" solfege so that we can take sightsinging breaks for fun. We include the basic conducting patterns as we practice rhythmic reading exercises, and we listen to lots of different music in many styles, sometimes for the purpose of identifying meter, and other times simply to share our favorite music. Best of all, since camp is meant to be fun, we include a variety of theory games along the way, particularly towards the end of camp as we review all that has been learned. For example, the class divides into two teams for a relay race in which students go to the board to answer questions that are sometimes quite complex. Here are two sample relay race questions:

1. In bass clef, notate the submediant pitch of the natural minor scale that has a tonic of G#.

2. Write the compound duple meter signature that has a beat division of a sixteenth note.

In the race, each student must arrive at an individual answer before getting additional help from the team. Besides being a lot of fun, this game helps tie together many different concepts learned during the camp, it requires students to rely on accuracy and speed,

and it gives students an opportunity to encourage one another through team work. Another popular camp game that also presents challenging questions in a comprehensive manner is "theory bingo," with popcorn (already popped) for playing pieces and an "I love theory" free space in the middle of the playing cards.

The fun activities interspersed within the classroom hours, along with the social events at other times, work together to maintain a relaxed atmosphere throughout the ten days. Spending so much time together, day and night, quickly establishes an atmosphere of support and caring among the students and faculty. We all share a common goal, and everyone supports and encourages one another through the successes and struggles that take place during camp. The success of Theory Camp is evident in the students' grades, and Figure 2 presents some general findings comparing theory grades for camp graduates with theory grades for "regular" Elements of Music graduates. To calculate percentages, individual letter grades were assigned a numerical percentage value, as indicated in the figure. A total of 68 students have completed Theory Camp thus far (n=68), representing five classes (1996, '97, '98, '99, '00); and their combined average grade is 90.57 percent. Theory grades for the first four camp classes (minus '00) have been tracked through the four semesters of theory "core" classes. According to the Figure 2, the 52 camp graduates who have taken the first semester of the theory core sequence earned an average grade of 83.88 percent for that course. In subsequent semesters, the total number of campers decreases as some students transfer to other institutions or change their major to something other than music. What Figure 2 does not indicate is that out of the 153 grades from all campers in the four semesters of theory core, only ten of those grades were C- or below.

The total number of "non-campers" represented in Figure 2 needs some explanation. Students attending Theory Camp have consistently been music majors (with an occasional music minor) who plan to continue with additional theory courses, while "regular" Elements students (or "non-campers") tend to include both music majors as well as non-majors who take the course simply as an elective. In order to achieve better balance between the two groups, only the 37 Elements students who continued on with additional music theory courses were included in this particular com-

parison. The pool of Elements students contains a total of four classes (1997, '98, '99, '00), and their mean percentage grade is 85.58 percent, compared with 90.57 percent for campers. The higher mean for campers could be attributed to the intensity of focus for the ten days, the lack of "distractions" from other courses or school activities during that time, or a combination of the two. The lower mean for the traditional Elements course could be influenced by the fact that, unlike camp, the course is spread over an entire semester and is part of a full load of classes for each student.

Figure 2 also illustrates that "combined" means for the theory core grades of both groups (campers and non-campers) are quite similar, with campers earning an 82.98 average and noncampers earning 83.10. These figures illustrate that at the very least, Theory Camp is as successful a course as the Elements course offered during the calendar school year.

To date, students from the first four Theory Camp classes (1996, '97, '98, '99) have been "tracked" throughout their four-semester theory sequence. Means of tracking include a faculty questionnaire and a student questionnaire. Theory faculty members are asked to assess the progress of each former camper in his or her class, for each of the four semesters of theory. In addition to providing details on students' grades for each semester, the faculty answer the questions listed in Figure 3. As the Figure illustrates, faculty members respond to each of the statements according to the scale provided: 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree. Means are included for each of the four semesters, for each of the two years, and for all four semesters combined. The questions can be divided into two groups: Questions 1-7 assess the camper; and Questions 8-14 compare the camper with other students in the class. Almost all the mean values fall above the "neutral" rank. The lowest means are found related to Question 10 ("Compared with the rest of the class, the number of times the student asked for outside help from the instructor was... Well Above Average, Above Average, Average, Below Average, or Well Below Average"). Of course, a student may seek little outside help for one of two reasons: 1) the student does not need outside help, or 2) the student needs help but does not seek it because of disinterest or lack of discipline. The highest means are associated with the two

FIGURE 2. Grade Comparisons:

Campers versus "Regular" Elements of Music Graduates (Non-Campers). The grades of Theory Campers were compared with the grades of those students who completed the "regular" Elements of Music course in the fall or spring semesters during the last five years. Mean grades are provided here, based upon assigned letter grades. Numerical percentages used for letter grades are as follows: A = 95, A- = 91.5, B+ = 88, B = 85, B- = 81.5, C+ = 78, C = 75, C- = 71.5, D+ = 68, D = 65, D- = 61.5, F = 58.

	Camp/Elements Grade	Theory Core Grades				
	Sem	1	2	3	4	Comb.
THEORY CAMPERS	90.57% (n=68)	83.88 (n=52)	84.57 (n=42)	80.70 (n=33)	81.60 (n=26)	82.98 (n=153)
ELEMENTS (NON-CAMPERS)	85.58% (n=37)	85.00 (n=37)	81.13 (n=27)	81.81 (n=21)	83.56 (n=18)	83.10 (n=103)

questions related to positive attitude (Questions 6 and 13) and with Question 2 that addresses students' comfort in asking questions in class. At the very least, data suggest that Theory Camp graduates, students who enter college with deficiencies in theory, are able to "hold their own" in the classroom throughout the four semesters. In addition, data suggest that camp graduates enter the theory core with more confidence and a better attitude than the "regular" theory students do.

Figure 4 provides the Student Questionnaire (with results), which is offered to former campers at the end of the freshman year, and again at the end of the sophomore year with slight adjustments in some questions, as indicated by the italics. Graduates of the first four Theory Camps were strongly encouraged to complete the Questionnaire, but not every student did so. The total numbers of students who did complete the survey are included in Figure 4. With a scale of 1 to 5, note the very positive responses to all seven questions. The two questions which produced the lowest mean scores were Question 2, which is concerned with development of good study habits, and Question 3, which assesses how much Theory Camp helped boost the campers' interest in the subject of music theory. Responses to Question 3 are understandable, because certainly music fundamental do not represent the most exciting set of topics in the world of music theory! What Figure 4 does not show is that for Questions 4 and 5, some campers gave scores of 5+, which were translated into 6 for statistical evaluation. The extremely positive response to these two questions reflects the general enthusiasm that campers have consistently expressed for the entire camp experience.

On the reverse side of the Student Questionnaire, campers are asked to write any comments they wish to make about their camp experience. When we first administered these questionnaires, my colleagues and I were overwhelmed and, quite frankly, surprised by the many positive comments we received from former campers. If we set aside all the statistics, the grades, and the opinions of faculty, we have what represents the heart and soul of the Theory Camp experience. Figure 5 lists some of the many comments that former campers have shared over the last five years.

FIGURE 3. Faculty Questionnaire Results.

Mean values are provided that indicate campers' performance in each of the four "core" theory courses, as well as combined, based upon two different scales (as listed within the figure). Faculty completed the surveys following each of the four core courses. One faculty member was unable to complete surveys for some students in semesters 3 and 4, which explains the smaller pools for those semesters (n=20 for Sem3, n=24 for Sem4), compared with the totals presented in Figure 2.

Question	First Year			Second Year			OVERALL
	Sem1 (n=52)	Sem2 (n=42)	Comb. (n=94)	Sem3 (n=20)	Sem4 (n=24)	Comb. (n=44)	(n=138)
[For Questions 1-7: 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree]							
1) Student participated regularly in class discussions:	3.50	3.55	3.52	2.85	3.37	3.13	3.40
2) Student felt comfortable asking questions in class:	3.92	3.76	3.85	3.30	3.57	3.44	3.72
3) Student felt comfortable seeking help from instructor outside of class:	3.69	3.19	3.47	3.50	3.39	3.44	3.46
4) Student showed a genuine interest in the subject:	3.25	3.38	3.31	3.25	3.41	3.34	3.32
5) Student exhibited well-disciplined study habits:	3.40	3.50	3.45	3.40	3.48	3.44	3.45
6) Student exhibited a positive attitude:	3.62	3.69	3.65	3.40	3.61	3.51	3.61
7) Student made adequate progress through the course of the semester (add specific comments,as warranted):	3.32	3.45	3.38	3.90	3.65	3.77	3.50
[For Questions 8-14: 5 = Well Above Average, 4 = Above Average, 3 = Average, 2 = Below Average, 1 = Well Below Average]							
8) Compared with the rest of the class, the student's level of class participation was:	3.69	3.26	3.51	2.70	3.17	2.95	3.33
9) Compared with the rest of the class, the student's willingness to ask questions during class was:	3.29	3.31	3.30	2.90	3.43	3.19	3.26
10) Compared with the rest of the class, the number of times the student asked for outside help from the instructor was:	2.79	2.69	2.74	2.70	2.96	2.84	2.78
11) Compared with the rest of the class, the student's interest in the subject was:	3.15	3.14	3.15	3.10	3.17	3.14	3.15
12) Compared with the rest of the class, the student's study habits and discipline were:	3.15	3.21	3.18	3.20	3.43	3.33	3.23
13) Compared with the rest of the class, the student's positive attitude was:	4.29	3.45	3.92	3.40	3.61	3.51	3.79
14) Compared with the rest of the class, the student's progress through the course of the semester was:	3.71	3.24	3.50	3.60	3.39	3.49	3.50

FIGURE 4. Student Questionnaire Results.

Mean values are provided, based upon the following response scale: 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree. Phrases in italics represent variances in the questions for the sophomore level questionnaire.

Question	Fresh. (n=19)	Soph. (n=9)	Com. (n=28)
1) The topics covered in Theory Camp (pitches, scales, key signatures, intervals, triads) helped me to gain a "head start" on freshman theory in the Fall *(or helped me throughout the music theory sequence).*	4.79	5.00	4.86
2) My participation in Theory Camp has helped me to develop good study habits for my freshman year *(or has continued to help me develop and maintain good study habits during my sophomore year).*	4.00	4.00	4.00
3) My participation in Theory Camp helped boost my interest in the subject of music theory.	4.21	4.44	4.29
4) The social activities provided during Theory Camp, and the chance to make new friends, were beneficial to me in my freshman year *(or have still benefited me during my sophomore year).*	4.84	4.89	4.86
5) I am glad that I chose to attend Theory Camp.	4.89	5.00	4.93
6) I would recommend Theory Camp to incoming music students who need to gain a "head start" on theory fundamentals.	4.84	5.00	4.89
7) *I think the work I did in my four semesters of music theory was at LEAST average (or better), compared with the other students in my class.*	xxx	3.89	xxx

It was not anticipated that this intensive fundamentals course would have such a powerful effect on students and would provide such lasting benefits that reach far beyond mere fundamentals remediation. The placement of the camp experience shortly before fall semester of the freshman year provides campers with great self-confidence, not only as they enter the theory core sequence, but as they enter college life in general. In fact, many campers have moved on to become top students in subsequent theory classes. Steven Stolen, Chair of the Music Department, remarked that "The socialization of new colleagues is invaluable to the department, especially since these students, because of their lack of background, might not otherwise emerge as quality students due to the regular beginning-of-the-year problems that less experienced music students have with theory."[9] Instead of campers feeling singled out as being deficient in theory, they feel privileged to be a part of such an experience as Theory Camp. Faculty find the experience particularly fulfilling as well. "I found that after doing it once, it was a great way to spend those ten days," expressed Hoke. "It wasn't like ending the summer early and coming back to something that was drudgery. It really was a rewarding experience, both for students and for faculty."[10] And like many camp experiences, the last day of Theory Camp is typically mixed with satisfaction and sadness; academic goals have been successfully met, friendships have been forged, but the group that has bonded in such a wonderful way will no longer be together.

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[9]From correspondence with Steven Stolen on 28 June 2001. Stolen is Professor of Voice and Chair of the Music Department of Butler University.

[10]Hoke, personal interview.

FIGURE 5. Comments from Former Campers.

- This camp was incredibly invaluable to my success as a theory student.
- Oh my gosh, I cannot say enough great things about Theory Camp! I have never learned so much in such a short amount of time! I never would have survived Theory 101/102 (First-Year Theory) without it. I met some awesome people in Theory Camp. Actually, two of my best friends are from Theory Camp. Also, the activities were great. Being from Denver, I wasn't very familiar with the city, but Camp got us off campus and to a few neat places.
- I was glad to be completely settled into the dorm room early and orient myself with the campus. I wasn't worried at all my first day of classes because everything was old hat.
- The friends that I have made during Theory Camp will last for life, and also it gave us a head start in socializing and knowing our way around campus.
- Since we got to spend time with professors on a social basis, we could not be as intimidated as maybe we would be during the year. The things you did for us made us feel special.
- I really benefited from Theory Camp. I felt I was a step ahead because I knew the style of teaching and I already had made a good base of friends. It was a very crucial part of my transition into college.
- Through the Theory Camp I made quite a few friends. Still when a bunch of us get together, we make it known that we went to the camp. This was an experience that I feel fortunate to have participated in. I hope for the sake of other musicians like me, that you continue with this program.
- Theory Camp was an extremely positive experience. If it had not been offered, I would now be a year behind with my required courses for my degree.
- Theory Camp was one of my most memorable times of my first two years at college. Not only did I receive a grasp on the materials, but it gave me confidence in the material for the following four semesters.

Modeling Professional Practice in Music Analysis with Computing

David Walker & William Renwick

The Problem

There is often a difficult and confusing gap between graduate school and beginning professional practice. After spending years in the culture of schooling, new graduates can find the challenges of the workplace baffling and stressful. University educators have begun to address this, forging links between the classroom and the "real" world. While many of these studies are exploratory in nature, Collins (1992) has pointed out that by sharing the results of such "design experiments" can we can begin to found a design science of education.

This study attempts to bridge this gap by providing graduate students with learning tasks that are authentic to their professional goals. Rather than have them complete yet one more school assignment, we wanted them to complete a publishable piece of work. We planned to achieve this by modeling the publication process for an on-line music journal, hoping that this experience would give students skill, knowledge and confidence as they move into the professional world. The students would act both as contributors and as the editorial committee, and their final World Wide Web-based journal would be made available to the world via the Internet. This would be a chance to write for their peers and interested others, and would give them opportunities to act in the various roles involved in journal production, such as layout, editing, and peer reviewers in a more real environment.

Aware that we were increasing demands on already hectic schedules, we hoped that the use of a computer-mediated communication system would allow the students to help one another and to contact the professor between class sessions. This was a particular

concern since the course was centered on Schenkerian analysis, which is very difficult to teach adequately in the single semester that was provided for it (Beach, 1983; Rothstein, 1990b). Finally, while the students were not theory or analysis majors but music criticism students, analysis remains an important skill for music critics in particular as well as for graduate students generally (Gagné, 1994).

Theoretical Framework

The most successful students tend to be self-directed, especially at the university level (Knowles, 1975; Brookfield, 1988). Elizabeth West Marvin (1994) reported in this journal on the "scientific verification for a pedagogical principle that good teachers already know by experience and intuition: students learn better when motivated by their own interest in a subject" (p. 47). As Thomas Benjamin suggested in the same issue, "the bottom line, maybe, is that the less responsibility we as teachers take for the learning, the more the students will, if allowed to" (p. 60). This self-directed motivation is the foundation of recent learning theories such as reciprocal teaching (Brown & Campione, 1994; Brown & Palincsar, 1989), cooperative knowledge-building (Scardamalia & Bereiter, 1999), and legitimate peripheral participation (Lave & Wenger, 1991). These are constructivist theories (Honebein, Duffy, & Fishman, 1993; Jonassen, 1994). Rooted in cognitive science (Norman, 1981), constructivism addresses a learner as the constructor of one's own knowledge, as opposed to a passive vessel into which knowledge is "poured". Within constructivist circles, most of the attention has been paid to concepts of apprenticeship, or more particularly "cognitive apprenticeship" (Collins, Brown, & Newman, 1989). As in traditional trade apprenticeship, cognitive apprentices learn procedures, strategies, and techniques from a master, but these are applied to cognitive goals rather than physical tasks.

Legitimate peripheral participation (Lave & Wenger, 1991) extends the idea of cognitive apprenticeship, and incorporates ideas of situated learning and its social aspects (Brown, Collins, & Duguid, 1989; Brown & Duguid, 2000). Lave and Wenger suggest that learning is situated in "communities of practice." More than collections of individuals learning or working on their own, these communi-

ties influence what is learned, and how it is learned within the social context. They posit that learning happens through legitimate peripheral participation in communities. That is, learners participate in a legitimate way, one that is meaningful and relevant to the learner as well as the other members of the community. This participation is not necessarily leading edge or central to the field, but usually more peripheral. Thus learners "get their feet wet", but in the real world.

In most cases, graduate students interact with a number of communities, but of greatest importance are their local community and the community of professional practice. The class in which they find themselves, with all of the peer interactions and pressures typical of schooling, is often their local community. There is also a great influence from the community of professional practice, which would include publishing academics, other graduate students, and other members of the professional community. It was our goal to help the students contact the community of professional practice via their journal articles, while participating in a supportive local community.

The Research

For this study, David Walker wanted to discover the students' perspective on this course directly from them, rather than mediated by how their professor thought they felt. As Lincoln (1995) notes, we have few studies about learning in which the learners are actually asked about their experience, and this is a particularly important voice that should not be silenced. We can not judge the efficacy of teaching by the products that result alone, since outcomes may be influenced by factors of which we are completely ignorant. We wanted to know whether the students felt that they learned things of value, and to compare their perceptions with the final articles as well as Renwick's perception.

Primary data was gathered via participant-observation (Spradley, 1980). In order to have some access to the students' experience, Walker observed their classes and on-line discussions, occasionally taking part or answering questions, taking field notes all the while. After each class session, these notes were typed up and subjected to a preliminary analysis to determine major and emer-

gent themes, using the constant comparative method (Glaser & Strauss, 1967) as adapted by Lincoln and Guba (1985). During analysis, the data was entered into a computer database and coded according to themes.

More formally, the participants answered bi-weekly questionnaires which asked such open-ended questions as "What was best about the class this week?" "What was worst about the class this week?" "What most helped your learning this week?" "What most hindered your learning this week?" These answers were then coded and entered into the database. As the semester progressed, and new issues emerged; these turned up in the questionnaires. Finally, at the end of the semester each student took part in a private interview with Walker, who asked questions about computer use, collaboration, and the journal experience, as well as issues that they had raised over the term. At the start of each interview, Walker presented each student with a summary of his findings regarding their experience, and asked for their confirmation or correction. The interview questions were based on their particular experience, and were open-ended to allow the participants to share their most important feelings and issues. This approach allowed for considerable triangulation between data sources as well as providing member checks with each participant (Miles & Huberman, 1994).

Our Roles

Professor Renwick taught this course, and was responsible for the course content and course design. Walker was a researcher studying this class. He assisted Renwick with the course design and provided technical support.

The Class

Analysis is one of five required courses in the Masters in Music Criticism program. As the program has evolved over the years, it has seemed increasingly important to equip students with tangible analytical skills. At the same time, it is increasingly important that students develop credible skills at communicating their ideas. Thus,

we wanted to develop students' abilities to express their ideas through electronic means, where so much current academic activity is being channeled. We wanted to give the students a "real" experience in working with these technologies, something that they could take with them into whatever field of endeavor they might advance.

In reformulating the course, Renwick chose to narrow its scope to analytical techniques for tonal music of the period Bach through Brahms (with one exception, a piece by Palestrina that was intended as a foil to the others). Central to current discourse on this music is the body of music theory and analysis created by the Austrian theorist Heinrich Schenker in the period 1910-1935. Briefly, Schenker posits that the integrity of tonal music resides in its organization around levels of structure, such that certain musical events become primary points of stability or resolution and other events have elaborative functions. At the same time Renwick decided to focus on certain issues within this area, specifically ternary or three-part form.

Our goal was to see if we could help students in this program to form a supportive local community, and to make meaningful contact with the community of practice. The class consisted of eight students. While teaching Schenkerian analysis in a single semester is challenging enough (Beach, 1983; Rothstein, 1990), these students displayed a typically broad spectrum of exposure to analysis, with only two having any experience of Schenkerian analysis before this class.

Computer Conferencing

We planned to use a computer conferencing system to help build a community outside of class time, as well as to host their reviews of each other's the journal articles. This was to be used in support of their regular seminar classes. We hoped that the students would present and discuss their ideas for the next class, so that they would be familiar with each other's ideas before the class began. Only one of the students had formal computing training, and none had used computer-based conferencing for a class before. In fact, none of them had even created web pages. These were serious concerns given that the professor for the course wanted the students to prepare, as a final assignment, publication-quality essays on music analysis.

The Journal

In order to give them a more authentic experience of the community of professional practice, the students were to write a journal article, which would be published at the end of the semester in an on-line journal created by the students. Thus they would not just be writing an article, but learning the process of peer-review and creating a web-based journal. The review process was modeled in the private computer conference, where drafts could be presented and critiqued, with the final articles published in the public web journal.

In order to simulate a "real" experience in academic publishing, we encouraged the students to work out the publishing issues amongst themselves. This began by establishing a list of publication tasks, such as editing and supplying constructive criticism, proofreading, establishing a style-sheet for format and layout, and creating a feasible publication schedule. Two students acted as editors, all students acted as the publication committee—as readers, critics, and proofreaders, and several students took on specialized tasks such as design issues and trouble-shooting. Peer-review encouraged dialogue amongst the students, and was one of the best features of the program. The tight publication schedule was certainly a challenge—just as it often is in the "real" world—as students were expected to have their work completed, written up and on-line by the first week of December, only 12 weeks after the beginning of the course. In the end, the fact that the students took ownership of the time-line was one of the best aspects of the course. The journal was completed on time, and they all succeeded in meeting the expectations.

Benefits

The participants successfully created a supportive local community. Most of the community discussion was carried on on-line in their computer conference, as they were rarely on campus together. All but one of the students felt that they had gained a great deal from this community, and they identified a number of benefits from their interactions. Foremost was the new perspectives that every one felt that they gained from seeing another's thought processes during

analysis. Students reported that they found their ideas challenged, or reinforced, and that these new ways of considering analysis were exciting to encounter.

Several students mentioned the use of models. Seeing their classmates' postings in the conference gave some students a starting point, with clear parameters for participation. Others found models for improving their own writing style, and as challenges to their thinking.

The use of asynchronous conferencing allowed students to work at their own pace, and on their own schedules. It also enabled the shy students to have more input into discussions. Whereas one or two students dominated most of the class discussion throughout the semester, the other six students were much more dominant on-line, and some of the most influential students contributed mostly on-line.

Perhaps most important for teaching, seven of the eight students felt that the discussions on-line prepared them better for class. These discussions, which the students felt would not have happened without the use of such a conferencing system, allowed the students to present their ideas and have preliminary discussions before class. During the classroom hours, the students found that they had more in-depth discussions because they were already familiar with each other's stances, and had a chance to evaluate their own in the light of the others'. Renwick indicated that he was very pleased with the deeper level of discourse that these students achieved.

A few students felt that they had good quality information shared, but it was somewhat surprising that they felt that this information was mostly about writing style and computer use. There were a few notes about analysis in general, and very few about Schenkerian analysis.

By far the most important experience of the class was the journal. Most students found that it focussed their learning over the entire semester, and gave them a concrete goal towards which to strive. They felt that they had to do their best work because they were presenting themselves to the professional community, and the professor was pleasantly surprised that the majority of the students wrote articles far beyond what he would have judged them capable at the start of the term.

Outcomes

The local community provided support for the students and helped their learning, but it went beyond these and had a profound effect on the actual course content. Conference discussions and presentations contained syntheses of the students' pedagogical and research interests with Schenkerian analysis, and these syntheses formed the basis of the final articles. To accommodate the emerging syntheses, Renwick had to abandon some of his planned material and re-arrange class content "on the fly." Fortunately, he was flexible enough to do this. Also, he valued the combination of Schenkerian approaches with other methods, and encouraged the synthesis of different approaches. For the journal, he stressed analytic integrity and clear communication above all.

The experience of the course affected the participants' plans for their own future teaching. Most plan to use computer conferencing in their classes if at all possible. All plan to use some version of a student journal. This is remarkable because none of them was a proponent of computer conferencing at the start of the semester, and there was a good deal of skepticism about the journal from all of them at first.

In considering what the students took from the course, it is interesting to note what they felt would be valuable for their careers. All of them felt that the computing skills that they learned would be valuable in the future. By contrast, only three felt that Schenkerian analysis might be important to their future work, and none planned to work as analysts.

Reception of the Journal

When the journal was ready, we posted it live and announced it to the Society for Music Theory's email discussion list. Since that time a number of people have looked at the work and we have received some very interesting responses. One, from a Professor in Binghamton, an expert Schenkerian analyst concerned Renwick's interpretation of Schenker's view on musical form. We received permission to post that response as a postscript to the appendix. Another, from Professor Boris Plotnikov in Krasnoyarsk, Russia, sent

to the Society for Music Theory list, vividly demonstrates the potential for this type of work to reach literally around the globe, and specifically from one student body to another:

> Though, in principle, well aware that analyzing methods (and teaching analysis) prevailing in my country differ from those common in the USA and Canada, one could not clearly identify the points of difference. Studying the works on the Web page is very useful for expanding one's teaching eyesight.
>
> This sort of [analytic] information is of great use in a narrowly practical sense too. E.g. yesterday, I handed the two texts on Chopin to my undergraduate student (alas, the only one that fluently reads English), without any introductory comment, and [asked] her to read the texts, make her own analyses, define the difference in approach and express her personal opinion on the matter.
>
> Let the good example be followed by others.

Conclusions

The students did form a local community, which all but one felt was a very valuable source of ideas and support. This community was enabled by the computer conferencing system. All of the students were able to make contact with the professional community via the journal, and very favorable feedback has been received from professionals in other countries. The quality of the articles was a pleasant surprise to the professor, the researcher, and the students themselves. This suggests that the journal experiment may have helped the students exceed their teacher's expectations, and at least did not impede them from doing so.

From the vantage point of the instructor, the approach taken here has encouraged a cooperative learning environment for the students. Dialogue has taken place frequently throughout the term, and students have worked on projects together. They have worked together on technical problems and helped each other to formulate their articles. All this has taken place to a much great extent than in my past experience. To Marvin's (1994) excellent advice that we would do well to "make connections to the daily lives of our students" (p. 57), we would only add "no matter what their involve-

ment in music might be." For this course we attempted to connect the students' studies in criticism with the practical aspects of writing journal articles, and to relate analysis as a useful tool for the writing critic.

As a design experiment (Collins, 1992; Brown, 1992) this study gave us much to think about for the future. We did not solve the problem of teaching Schenkerian analysis in a single semester, but we did see the students use of Schenker's techniques arise from engagement with the music itself (cf. Rothstein, 1990a) and integrated with their own interests within critical musicology. We hope that interested colleagues will extend our work and perhaps forge links between their classes to form a larger community of practice.

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Teaching Ear Training Using Medieval and Renaissance Music[1]

Richard Devore & Ralph Lorenz

Most commercially available aural skills materials intended for use in undergraduate core curricula focus almost entirely on the study of tonal and/or twentieth-century techniques and literature. This approach, however, neglects the huge body of Medieval and Renaissance literature that provides the foundation for later Western music. Students do study this repertoire in college music curricula, of course, but often systematic study is limited to their music literature and music history coursework, with only sporadic exposure in written music theory classes (most often to sixteenth-century counterpoint) and ensembles.[2] They consequently never receive systematic aural or analytical training in music written before about 1650. Such an approach is sometimes dictated by time limitations within a four-year curriculum. However, in some cases it may be tacitly supported by music theory instructors who are not accustomed to incorporating aural study of Medieval and Renaissance literature in their curriculum. This situation may at least par-

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[1]This paper was first presented as part of a poster session at the annual meeting of Music Theory Midwest, Butler University, Indianapolis, IN, 15 May 1999.

[2]A few theory and ear training textbooks have emphasized the study of this repertoire. Theory textbooks that use a chronological historical approach include John Baur, *Music Theory through Literature*, 2 vols. (Englewood Cliffs, NJ: Prentice-Hall, 1985); and Paul Cooper, *Perspectives in Music Theory: An Historical-Analytical Approach* (New York: Dodd, Mead & Company, 1975). We use the first volume of Baur for our second-year classes; although out of print, it is available directly from the author. Skills textbooks that have used this approach include Richard P. DeLone, *Literature and Materials for Sightsinging* (New York: Holt, Rinehart and Winston, 1981); and Gary E. Wittlich and Lee Humphries, *Ear Training: An Approach through Music Literature* (New York: Harcourt Brace Jovanovich, 1974).

tially be a result of the emphasis placed on tonal and twentieth-century music in the training they experienced as undergraduate music majors and as future music theory faculty.

A fundamental premise of our approach to theory instruction is that undergraduate music majors need to learn about all historical styles of Western music from both a theoretical and an aural perspective. To this end, we have designed and adopted a core curriculum that incorporates ten weeks of Medieval and Renaissance music into our third-semester class, titled "Music Theory to 1750." This class, like all of our core theory classes, uses an integrated approach in which the teaching of written and aural skills is correlated. Students concurrently analyze, compose, take dictation, sing, and play keyboard exercises dealing with one topic.[3] Students are introduced to modal music after they have received two semesters of aural and written training dealing with tonal music and have refined basic concepts of sight singing, dictation, composition, and analysis.

Waiting until the third semester to begin this study raises some questions about the curriculum. For example, what material must be omitted to make room for this approach? How do students handle a return to highly chromatic materials in the fourth semester? Our experience has shown that the higher level of maturity that students possess in their second year of study enhances their receptivity to this approach, as first-year students generally enter college with a fairly narrow view of music literature. After having built a foundation of basic theoretical materials, students are better prepared to comprehend modal materials in the context of historical development. Spiral learning is encouraged because concepts that are common to both modal and tonal music, such as non-harmonic tones, are reinforced from a new perspective.[4] The Medieval and Renais-

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[3]The issue of integrated vs. separated classes is dealt with at length in Michael R. Rogers' book, *Teaching Approaches in Music Theory: An Overview of Pedagogical Philosophies* (Carbondale: Southern Illinois University Press, 1984).

[4]This design attempts to address criticisms of curricula that begin study of early music and/or species counterpoint in the freshman year. One criticism is that freshmen need basics of tonal theory in order to function well in ensembles and applied instruction.

sance music unit in the theory sequence is taught at the same time as the analogous unit in the students' music history sequence, "Music History to 1750." Students thus study the modal repertoire simultaneously from analytical, aural, compositional, and historical standpoints. This "immersion" approach encourages students to gain maximum familiarity with what to many of them is an unfamiliar repertoire. As we have a fifth-semester theory and history course that covers music since 1900, we find that we are still able to include all or most of the materials that are normally covered in the core theory curriculum.

These early music examples can also be used as supplemental training materials in a traditional tonal-based curriculum. It is not necessary for the instructor to be an expert in Medieval and Renaissance music; most of the pitch and rhythmic concepts are familiar from work with tonal materials. For example, beginning harmonic dictation with organum allows the instructor to focus on the perfect intervals used in early organum, then later to move to the greater variety of intervals heard in subsequent organum. Throughout this article we provide background information and suggestions on how to use the examples. These excerpts have generally been selected from accessible and standard sources of early music. We have avoided highly chromatic works such as the madrigals of Gesualdo and Marenzio, because the harmonic idiom therein is too far removed from functional tonality for success within our limited amount of time. In cases where the overall mode is unclear, we suggest using the clearest possible frame of reference for the pitch center.[5]

A chronological approach to modal ear training and sight singing beginning with Gregorian chant and continuing to the early seventeenth century offers many inherent pedagogical advantages and allows the instructor to present materials in a pedagogically and musically effective sequence. This sequence will be illustrated in the musical examples below. Modal music is also adaptable to many different types of solfege systems. It can be sung in the historically correct fashion, using hexachords and mutation, and even making use of the Guidonian hand. It can also be taught as traditional *do-*

[5]For instance, see our discussion of the mode in Example 9.

based movable-*do*, with chromatic inflections for the various scale degrees. In the latter system, for example, Dorian (first) mode becomes *do re me fa sol la te do*, while Lydian (fifth) mode becomes *do re mi fi sol la ti do*. This approach can be used in a non-historical way to emphasize the difference between the "minorish" and "majorish" modes and to exploit the students' familiarity with tonal solfege. Example 1 demonstrates solmization for all of the modes using the movable-*do* (minor *do*) approach.[6] Finally, a fixed-*do* approach can be used, with each mode beginning on a different syllable. In this system, nontransposed Dorian becomes *re mi fa sol la ti do re*, while Lydian becomes *fa sol la ti do re mi fa*.[7]

If desired, other skills can be taught as well. For example, *musica ficta* as performed or not performed in recordings can lead to musical debates and excellent "error detection" practice. Following are descriptions of some of the examples we use for ear training exercises. They are organized in chronological fashion. Note that in multi-voice textures we often make individual voices easier for students to hear by separating them an octave more than in the original score.

A) Chant dictation and singing.[8] We start work with Gregorian chant, allowing some time for a basic introduction to the modal system. Here the emphasis is on melodic intervals, with no rhythmic

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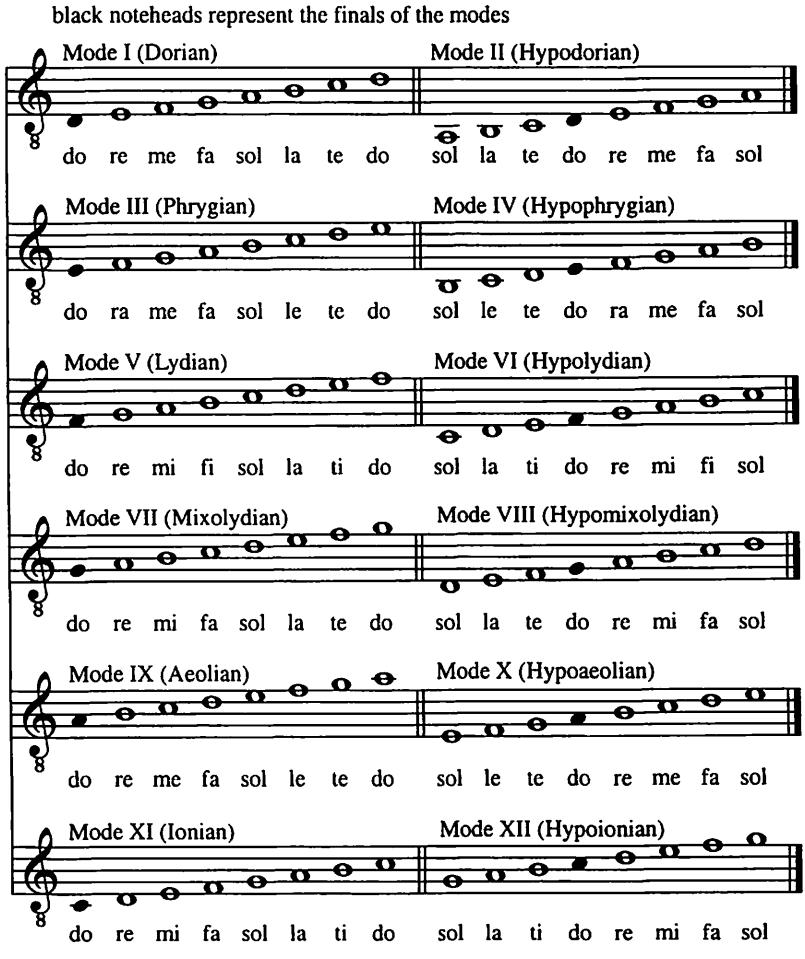
[6]Medieval theory was based on the eight-mode system, shown here as modes I-VIII. The sixteenth-century theorist Heinrich Glarean (*Dodecachordon*, 1547) recognized the growing need for a twelve-mode system, adding the authentic and plagal versions of Aeolian and Ionian (Modes IX-XII).

[7]For further discussion on the merits of various solfege systems applied to this repertoire, see Rosemary Killam, "Solmization with the Guidonian Hand: A Historical Introduction to Modal Counterpoint," *Journal of Music Theory Pedogogy* 2 (1988): 251-74; and Ralph Lorenz, "Canon as a Pedagogical Tool: Applications from Sixteenth-Century Wittenberg," *Indiana Theory Review* 16 (1995): 87-91.

[8]Cue notes given in the examples are reproduced at 100% size, while notes students are to dictate are reproduced at 75% size in the answer keys shown here. We would like to thank William Post, Stephen Stanziano, and James Leatherbarrow for their assistance in notating these examples.

Example 1

Movable-Do Solmization for the Modes



complexity. The primary type of motion is stepwise, with occasional skips. Such skips are often used motivically within a melody and tend to be characteristic of the given mode. The emphasis on stepwise motion makes the initial singing easier for most students. Melodic formulas associated with the different modes are easily demonstrated and learned. For example, the half step above and whole step below the final[9] in the third and fourth mode authentic/plagal[10] pair (Phrygian) contrasts audibly with the whole step above and below the final used as a cadence formula in the first and second mode pair (Dorian). The characteristic sound of each modal pair can be taught through these distinctive cadential formulas. Example 2 is in Mode II, or Hypodorian, because of the final and the range (or ambitus) used in the melody.[11] This example places much emphasis on the reciting tone,[12] F, and the third section features a characteristic leap down from D to A, into the plagal register a fourth below the final.

B) Free organum (ninth century).[13] The note-against-note style of free organum provides a logical step into multi-voice texture. We usually provide one voice in dictation, so students now have harmonic intervals as clues in their listening. This step begins our study of consonance and dissonance in harmonic intervals, which can easily be tied to the intervallic classification system of the Medieval theorist John of Garland (and other theorists).[14] The pedagogical

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[9]The final is the Medieval equivalent of tonic; it was generally the ending note of a chant composition.

[10]Authentic modes feature the range (or ambitus) of an octave above the final plus the step below the final. Plagal modes feature the octave range that starts a fourth below the final and extends a fifth above.

[11]This Kyrie is from Mass IX, *Liber usualis*.

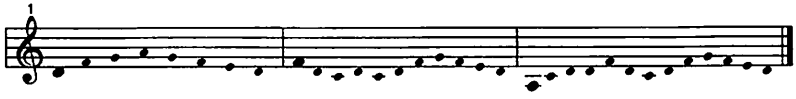
[12]The reciting tone, also known as the dominant or *repercussio*, is a mode-specific pitch that was used on a repeated basis during declamatory portions of text, especially in the formulas used for the singing of psalms.

[13]Archibald T. Davison and Willi Apel classify this example as a "freer type" of parallel organum, in *Historical Anthology of Music*, vol. 1, *Oriental, Medieval and Renaissance Music*, rev. ed. (Cambridge: Harvard University Press, 1977), 217. The excerpt is taken from p. 22.

[14]More information on Medieval systems of interval classification can be found in Richard L. Crocker, "Discant, Counterpoint, and Harmony," *Journal of the American Musicological Society* 15 (1962): 1-21.

Example 2

Kyrie, Mass IX, Liber usualis



emphasis is on both the linear and the horizontal aspects of the music. Our frame of reference for Example 3 is E Phrygian. This example affords the opportunity to contrast oblique motion (gradually moving from a unison out to a perfect fourth, then contracting back to a unison) with parallel motion (parallel fourths near the end of the excerpt).

C) St. Martial organum (twelfth century).[15] Organum from St. Martial is melismatic, introducing greater rhythmic independence between voices. Students are to add black note heads in the upper (organal) part against the given tenor. This style still features predominantly stepwise motion and simple rhythmic movement. We use "cue" notes in such examples to reinforce musical patterns and logical divisions in the music. Here the cue notes outline the sequential pattern used. Students should be encouraged to use recognition of the sequential pattern to help with their dictation. Other examples might emphasize different prominent melodic or harmonic features found in the music. Example 4 should be heard as E Phrygian.

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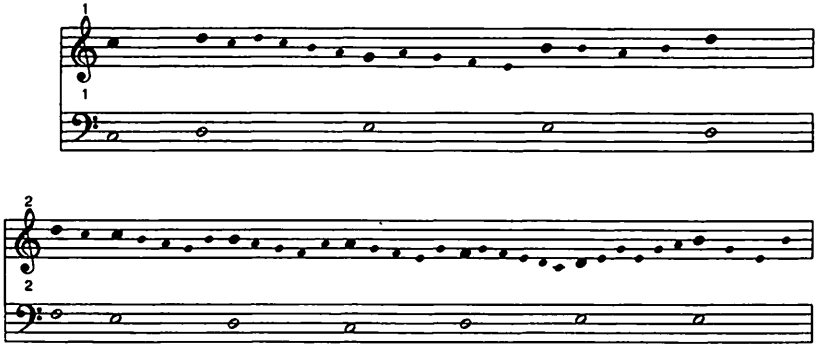
[15]*Laude jocunda*, adapted from Richard H. Hoppin, ed., *Anthology of Medieval Music* (New York: W. W. Norton, 1978), 42.

Example 3

Musica enchiriadis, free organum

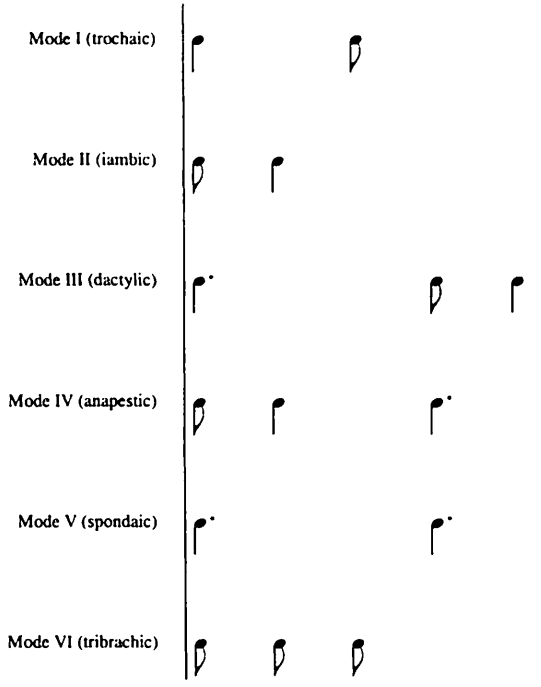
Example 4

St. Martial melismatic organum



D) Notre Dame clausula (twelfth century).[16] The Notre Dame style adds rhythm patterns from the six rhythmic modes, with the upper voice (the duplum) displaying more activity (although the tenor also moves faster than before). These rhythmic modes, illustrated in Example 5, provide a well-organized and relatively simple entry into the processes involved in the notation of rhythmic patterns. Note that the modal rhythms can be taught as groupings or patterns rather than as individual rhythmic values.

Example 5

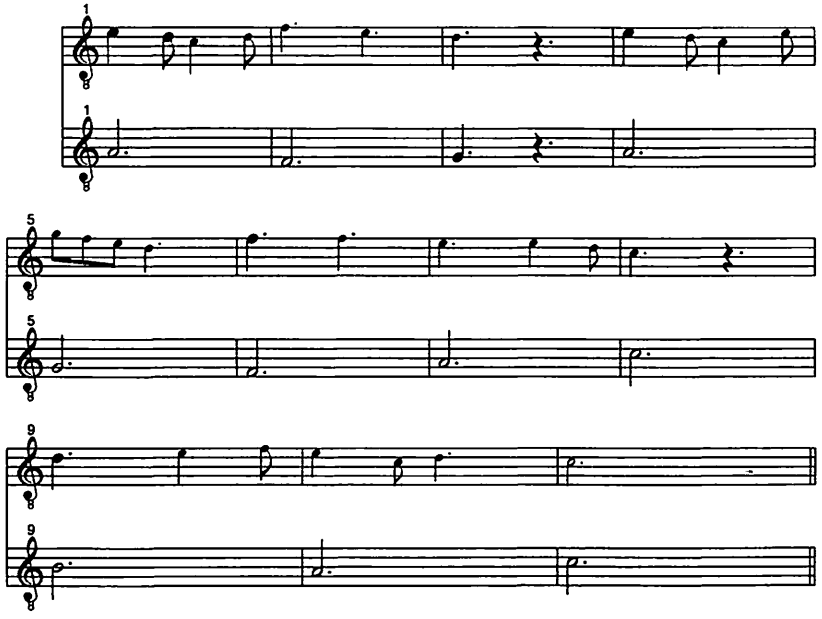


[16]*Alleluia: Nativitas*, adapted from ibid., 50.

In the exercise shown in Example 6, students are to complete the upper part against the given tenor. We work on hearing the vertical perfect intervals at the beginnings and endings of phrases, emphasized in this particular section that is known as a clausula.[17] In this transcription, the "downbeats" of most measures also feature perfect intervals. Use of clausulae avoids the extremely long-held notes in the tenor found in most organum from Notre Dame. We interpret this example as being F Lydian, ending on an intermediate cadence on C.

Example 6

Notre Dame organum, clausula section



[17]A clausula is a section of Notre Dame organum in which the tenor moves more quickly than in the non-clausula sections, and incorporates patterns from the system of rhythmic modes much like the upper voices.

E) Machaut, *Je ne cuit pas* (fourteenth century).[18] This Machaut example introduces syncopation and the use of *musica ficta*. In addition, the melodic inflections of the lines create considerable chromaticism. Students are again asked to notate the upper voice against the given tenor. As mentioned earlier, separating the parts by playing them one octave farther apart than notated simplifies the texture in this example by avoiding voice crossing. Our solfege is based on A Phrygian.[19] Students can better deal with the chromaticism in this example if they understand the logic behind its use. For example, the F-sharp in m. 4 is used to create the standard cadential pattern of a major sixth expanding out to an octave, while the F-natural in m. 5 is necessary to form a perfect interval against the tenor's B-flat.

F) Dufay, Benedictus from *Missa Se la face ay pale* (fifteenth century).[20] Our eartraining drill now includes the identification of non-harmonic tones, which in this example include passing tones, suspensions, and anticipations. We also work on hearing and labeling cadential motion such as the under-third (or escape tone) figure at the cadence. Students transcribe the upper voice, label the vertical intervals, and circle and label dissonances.[21] Thirds and sixths (the imperfect consonances) are now emphasized as harmonic intervals, in contrast to the earlier examples. The mode in this excerpt is F Lydian, ending with an intermediate cadence on C.

G) Binchois, *De plus en plus* (fifteenth century).[22] This Binchois example continues our study of fifteenth-century music. It empha-

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[18]Adapted from *Guillaume de Machaut: Musikalische Werke*, ed. Friedrich Ludwig, vol. 1, *Balladen, Rondeaux und Virelais* (Leipzig: Breitkopf & Härtel, 1954), 12.

[19]During this time period the normal modal system could also be transposed up by the interval of a perfect fourth. Thus, D Dorian becomes G Dorian, E Phrygian becomes A Phrygian, and so on. Each of these transpositions adds one flat to the mode.

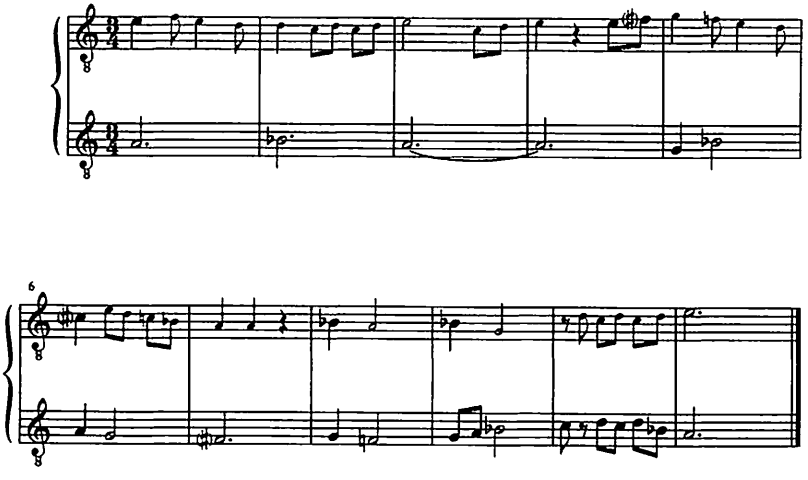
[20]Adapted from Richard L. Crocker, *A History of Musical Style* (New York: McGraw-Hill Book Company, 1966; reprint, New York: Dover Publications, 1986), 150.

[21]Compound intervals are reduced to within an octave in our labels.

[22]Adapted from Davison and Apel, 74.

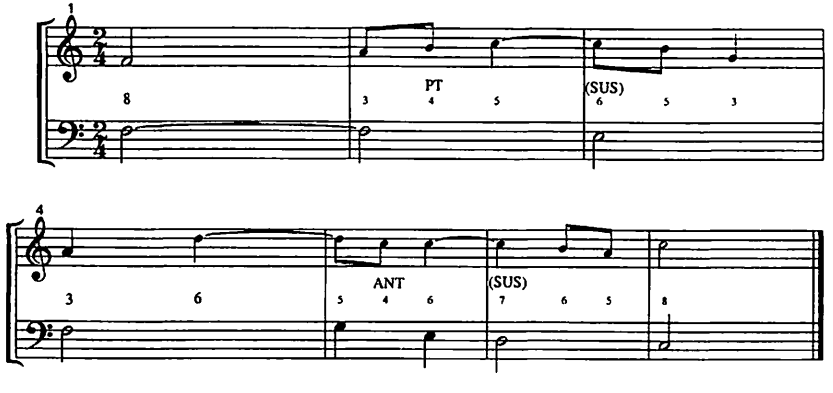
Example 7

Machaut:Je ne cuit pas



Example 8

Dufay: Missa Se la face ay pale- Benedictus



sizes escape tones as well as a passing tone, and it also uses thirds and sixths as harmonic intervals. Students complete the upper voice against the given voice. The final cadence again features under-third motion. Although the entire composition ends with a final on D, we recommend that this excerpt be sung and heard in C Ionian because of the temporary emphasis on C. The ending cadence on G, often called a tonal cadence, can be compared to the half cadence found in tonal music. Instructional strategies that could be used here include pointing out the arpeggiation of the C major triad in the second measure of the upper voice, and the use of sequence in the third measure.

H) Josquin, Kyrie from *Missa Pange Lingua* (sixteenth century).[23] This Josquin example incorporates dictation within a points-of-imitation style, involving a new type of skill in making cognitive and aural comparisons between the voices. Students are to complete the bassus. Differences between real and tonal imitation are introduced at this point.[24] Dictation using points of imitation also reinforces the written concepts taught in sixteenth-century counterpoint. Once students understand how the technique of imitation works, they can anticipate what the following voice will do. The excerpt cadences on C, within a framework of E Phrygian.

In addition to various types of dictation, singing, and error-detection exercises, we also utilize play-and-sing examples in which students are to sing one voice from a multi-voice texture and realize the remaining voices on the keyboard.[25] Play-and-sing exercises encourage students to practice the aural and physical coordination of multiple parts. We begin with two fairly simple lines and gradually increase the complexity, eventually adding a third

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[23]Adapted from Mary H. Wennerstrom, *Anthology of Musical Structure & Style* (Englewood Cliffs, NJ: Prentice-Hall, 1983), 28.

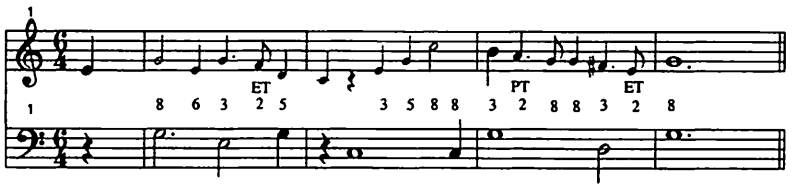
[24]Real imitation preserves exact intervallic structure. This Josquin example features tonal imitation, since the opening interval of a minor second (E to F) is answered as a major second (A to B). Students should be encouraged to hear this difference.

[25]For a modern use of play-and-sing exercises, see Sol Berkowitz, Gabriel Fontrier, and Leo Kraft, *A New Approach to Sight Singing*, 4th ed. (New York: W. W. Norton, 1997), 141- 233.

Example 9

De plus en plus

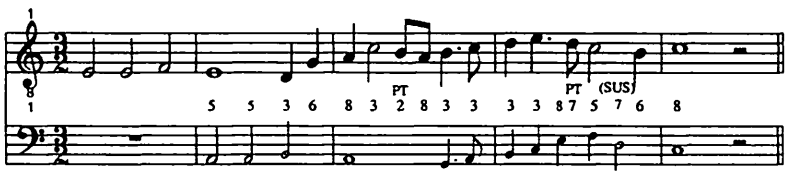
Binchois



Example 10

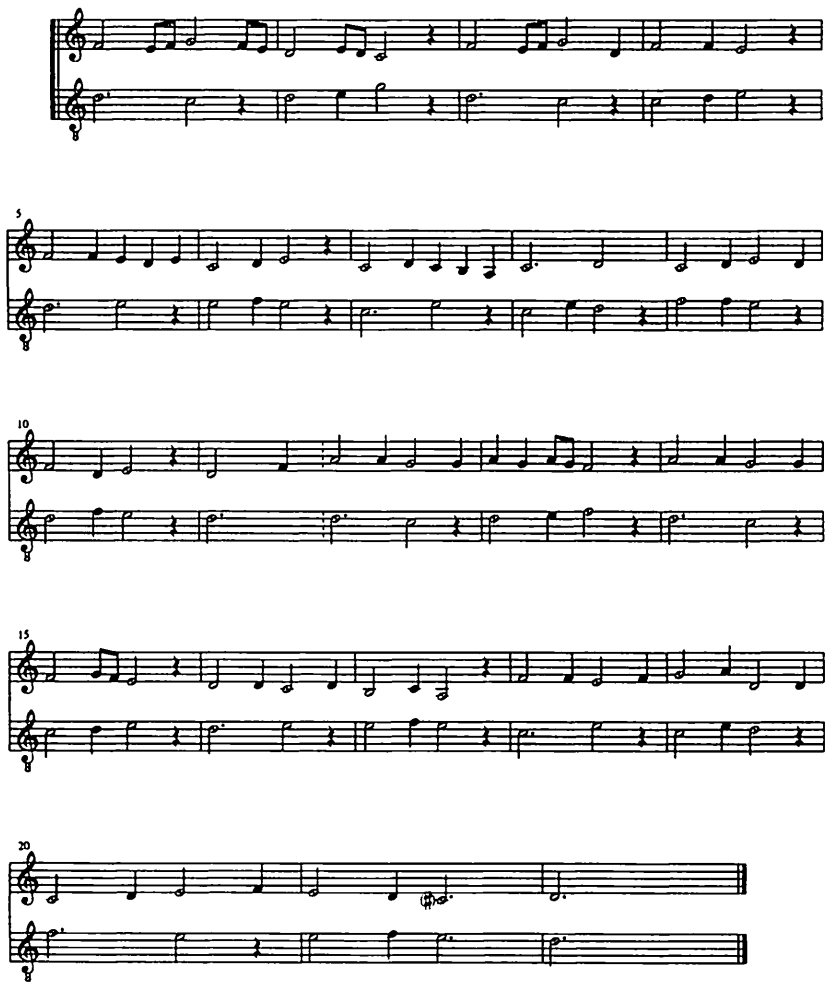
Kyrie, from Missa Pange Lingua

Josquin



Example 11

Deo confitemini/Domino



part. With practice, our students can easily handle a three-part texture (such as Example 12) that is not overly contrapuntal. Rhythmic and intervallic complexities between the parts are presented in a systematic manner. We introduce these examples in class by playing one of the parts at the keyboard and having the students sing the other parts. We also have the students practice fingering the keyboard part while singing one of the voices. Example 11 (*Deo confitemini/Domino*[26]) is a thirteenth-century motet in the style of clausula; the rhythm is derived from the rhythmic modes and incorporates basic isorhythm in the lower voice. For this example we ask students to sing the top voice with movable-*do* solfege in D Dorian while playing the bottom voice on the piano.

Example 12 (Busnoys, *Fortuna desperata*)[27] expands score performance to three voices. Students are asked to sing a voice of their choice and to play the other two voices on the piano. Sonorities now feature thirds, and cadences include octave-leap "tonal" types. Rhythmic complexity is kept to a minimum here so as to allow concentration on the harmonic aspects of the three-voice texture. We treat F as "*do*." Note that the tenor voice is to sound an octave lower than written.

Incorporating Medieval and Renaissance musical examples in a chronological order introduces pitch and rhythmic studies in a logical and pedagogically effective manner. The aural component of these studies reinforces the chronological written overview that students normally receive in music history but only occasionally encounter in music theory. This approach combines visual, aural, cognitive, and kinesthetic components of the learning process. Students who have completed this unit generally express a new understanding and genuine appreciation of early musical styles.

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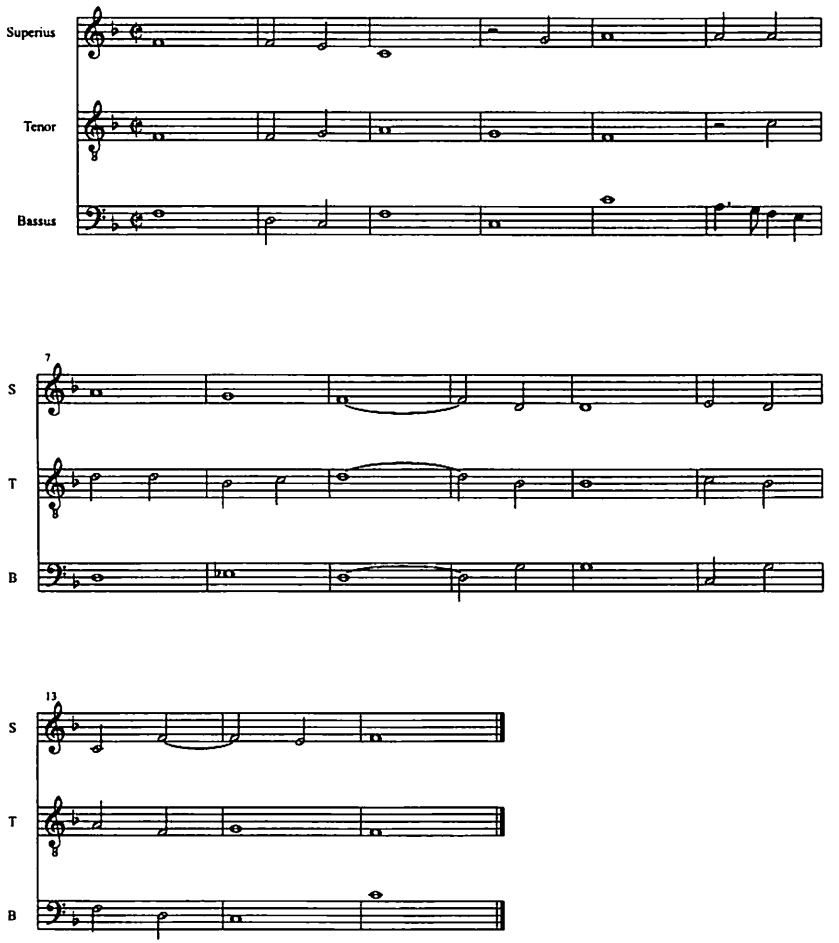
[26]Anonymous, Motet 47 from *Las Huelgas Codex*, adapted from Baur, 54-55.

[27]Adapted from Stephen Self, ed., *The Si Placet Repertoire of 1480-1530*, Recent Researches in the Music of the Renaissance, ed. James Haar, vol. 106 (Madison, WI: A-R Editions, 1996), 29-30.

Example 12

Busnoys: Fortuna desperata



Allen Cadwallader & David Gagné, *Analysis of Tonal Music: A Schenkerian Approach.* Oxford University Press, 1998.

Reviewed by Marianne Wheeldon

For the last fifteen years, the standard text for the study of Schenkerian analysis has been Allen Forte and Steven E. Gilbert's *Introduction to Schenkerian Analysis* (W. W. Norton, 1982). The recent publication of Allen Cadwallader and David Gagné's *Analysis of Tonal Music: A Schenkerian Approach* now provides a viable alternative for teachers and students. The newer book, of course, supersedes the older one in that its authors have been able to draw upon the intervening fifteen years of research. Throughout the text, these authors lead the students to Schenkerian research by citing relevant monographs and articles, and they close their study with a bibliography for suggested further readings. But in spite of the theoretical improvements, some pedagogical problems arise when using this text. While Cadwallader and Gagné's book is a welcome and much-needed addition, it does not entirely supplant Forte and Gilbert's text as the primary resource for teachers and students.

Cadwallader and Gagné's book divides into two halves, which neatly correspond to the two semesters of a year's study. Part 1, entitled "Basic Principles" (Chapters 1-7), introduces the student to Schenkerian notation, while part 2, "Analytical Applications" (Chapters 8-12), applies this notation to analyses of complete movements. This division works well in a two-semester course for the added reason that the final chapters of each section provide a natural stopping-point in the overall course of study. Both Chapter 7 ("Some Basic Elaborations of Fundamental Structure") and Chapter 12 ("A Theoretical View of Tonal Structure") close with a summary of the material learned to date, and place it within larger analytical and theoretical contexts respectively.

The audience for this textbook, as stated by the authors in their preface, is upperlevel undergraduate and graduate students. As such, it assumes no prior knowledge of the subject and begins at a rudimentary level, with an overview of melody and species counterpoint (Chapter 2) and harmonic function (Chapter 3). Despite their elementary nature, however, these chapters cannot be omitted; in addition to providing a review, they skillfully recast familiar materials in a Schenkerian light. The second chapter on melody and counterpoint, for example, introduces the student to important concepts in Schenkerian analysis, such as principal tones and embellishing figures, structural levels, the process of reduction, melodic prolongation, compound melody, and implied tones. Likewise, Chapter 3 interweaves new concepts such as harmonic prolongation, *Stufen*, and *Auskomponierung* within a review of harmonic function.

One criticism of these opening chapters, however, is that while clearly explaining various Schenkerian ideas, the authors choose not to provide the student with the notational symbols necessary for graphing them. For a formal presentation of basic Schenkerian notation, the reader must wait until Chapter 5, some one hundred pages into the text. The authors justify this approach in their preface:

> We assume no knowledge of graphic notation. In the early chapters we introduce some notation gradually and somewhat informally, reserving a more complete discussion of graphic symbols until the beginning of Chapter 5 (p. vii).

In practice, this approach does not work very well, especially since the authors often use "analytical interpretation" or graphic notation in their musical examples. Most of the examples in Chapter 2, for instance, illustrate the concept of compound melody. Why not, at this point in the text, introduce stems for structural notes, distinguish between the use of stemmed notes and noteheads, explain the notation of compound melody with upward and downward stems (all of which are already used in the musical examples), then move from annotated scores to simple Schenkerian graphs? The avoidance of basic Schenkerian notation is all the more surprising since the student exercises provided at the end of Chapter 2 require just this notation: Exercise 5 requires the student to put "long stems

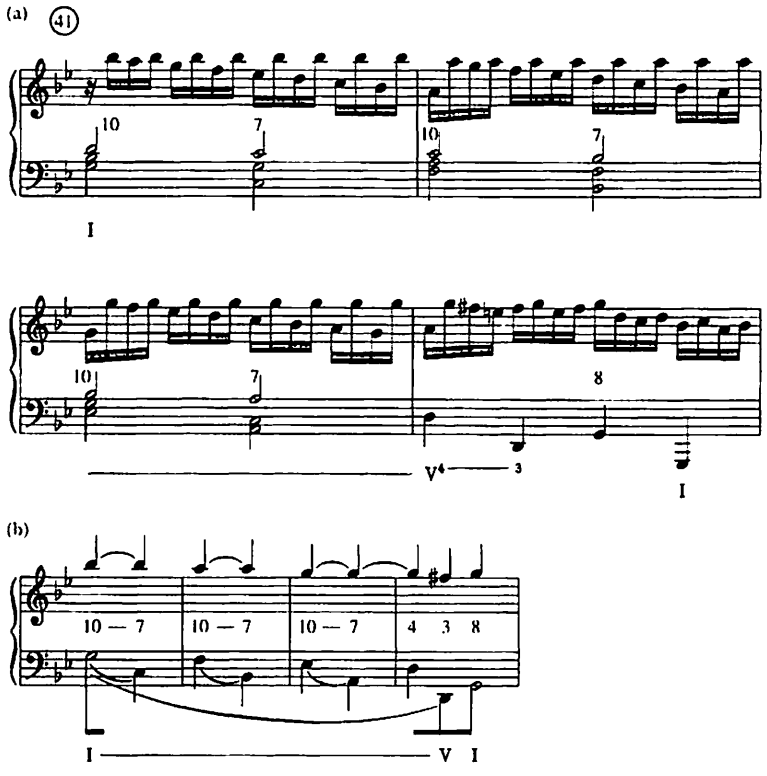
on structural notes," while Exercise 6 asks the student to "use ascending and descending stems...where top and inner voices are clearly distinguished" (p. 43). Since the student exercises need these graphic symbols, it would seem necessary to introduce them in the preceding chapter.

By waiting until the beginning of Chapter 5 (pp. 103-104) to present Schenkerian notation, the book gets off to an extremely slow start. Although in their preface, the authors stress a "hands-on approach" and "learning by doing many analyses" (p. vi), the students are not given any graphing tools, and are thus unable to produce a Schenkerian graph for much of the first semester of study. One advantage of Forte and Gilbert's approach in *Introduction to Schenkerian Analysis* is that by the end of Chapter 1 ("Melodic Diminutions"), the student can already complete rudimentary graphs using noteheads, stemmed noteheads, slurs, and ties. This immediately engages and challenges the student with new materials, as opposed to Cadwallader and Gagné's approach, which is more passive. Moreover, the decision to introduce notational symbols at the beginning of Chapter 5–which otherwise is devoted to Schenker's theory of tonal structure, structural levels, and the *Ursatz*–not only seems too late, but also out of place in this larger theoretical context.

One early chapter that would benefit from the prior introduction of Schenkerian notation is Chapter 4, which introduces linear techniques. Here, linear progressions, linear intervallic patterns, and the neighbor note are all introduced without recourse to notational symbols. While each of these topics is explained fully, the examples presented are either rhythmic reductions or annotated musical scores. As a result, students leave these chapters with the knowledge necessary to recognize linear techniques but with no clear idea of how to graph them.

In addition, the rhythmic reductions offered in this portion of the book are potentially misleading. For example, in the chapter on linear intervallic patterns, the reduction provided (see my Ex. 1) includes barlines and places stems on each change of harmony in the linear intervallic pattern. While this allows the student to see how the example at (b) derives from the music at (a), the reduction runs contrary to many of the statements used to explain linear in-

Example 1: *Analysis of Tonal Music,* Example 4.14, p. 93



tervallic patterns. The authors state that linear intervallic patterns "define larger structural connections" and "may move within (prolong) a chord or lead from one chord to another" (p. 87). But stemming every note in Example 4.14(b) obscures the fact that the linear intervallic pattern is a diminution that prolongs tonic harmony. Furthermore, stems are placed on every melodic note–regardless of whether it forms a consonant tenth or a dissonant seventh–and the slurs do not indicate the dependency of the dissonant seventh on the following chord for its resolution. Other errors also creep in: the first statement of the dominant should be notated as the structural arrival of that chord, and this dominant should not be beamed at the same level as the open notehead tonic, which conflates the

background and foreground levels of the graph. This final detail may seem insignificant when the main topic of the chapter–linear intervallic patterns–is explained so well. But it is an error that is consistently repeated: of the nine quasi-Schenkerian graphs offered in this section, six contain this error.

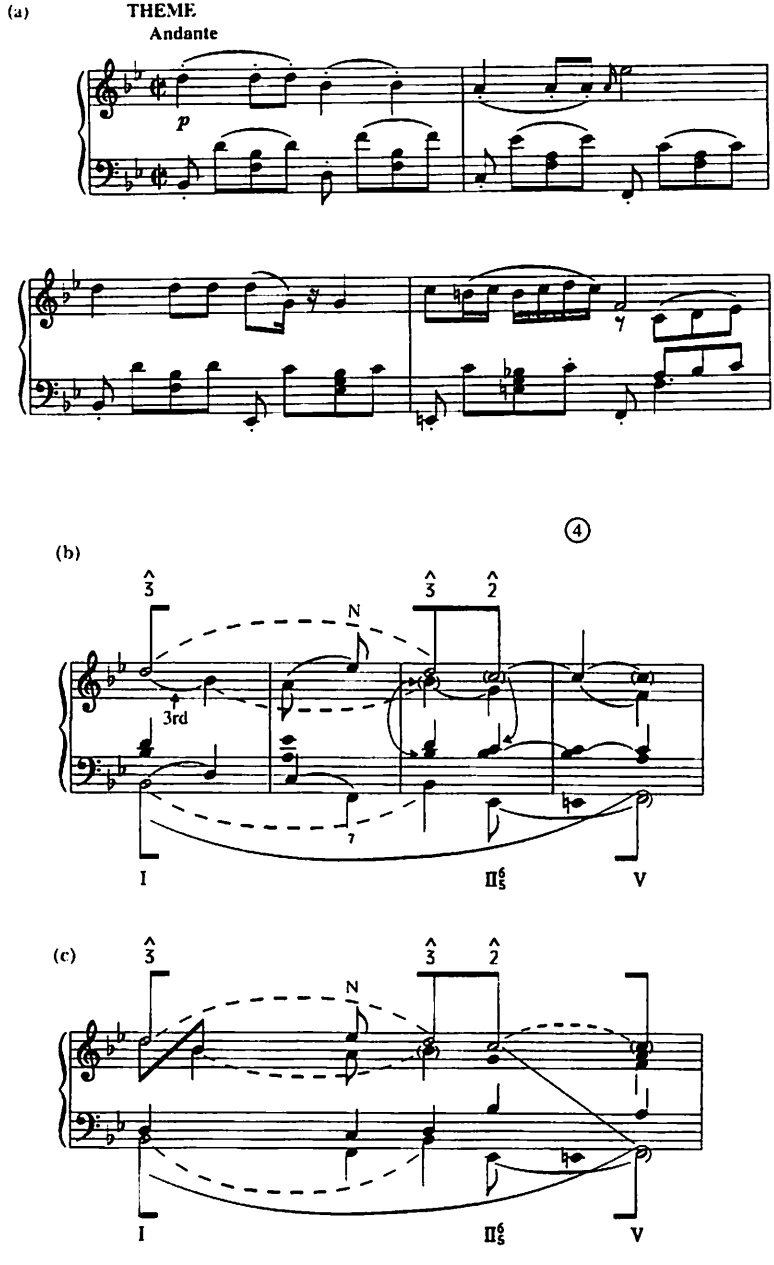
Many of these initial concerns disappear once the authors introduce Schenkerian symbols in Chapter 5. From this point forward, the musical examples can dispense with rhythmic reductions and annotated scores to offer fully-fledged Schenkerian analyses. Chapter 6, "Techniques of Melodic Prolongation," immediately adds to this repertoire of notational symbols and proceeds to more advanced Schenkerian graphing techniques. All the topics–*Anstieg*, arpeggiated ascent, unfolding, motion into an inner voice, motion from an inner voice, voice exchange, shift of register, register transfer, coupling, reaching over, cover tone, substitution, and the Phrygian $\hat{2}$–are presented in concise sub-chapters, each of which comprise approximately one to two pages of text and include one or two musical examples. The brevity of these sub-chapters allows the authors to come immediately to the point, with concise definitions and explanations, which are then illustrated with well-chosen musical examples.

Only one topic within Chapter 6 does not benefit from this format. In the two pages that explain the concept of unfolding, the authors provide four guidelines that can be summarized as follows:

1) an unfolding occurs between the two voices of a polyphonic melody;
2) an unfolding "generally linearizes a pair of intervals" (p. 129);
3) an unfolding can occur "between tones of the same chord...or between tones of different chords" (p. 130);
4) an "unfolding always involves a change of direction" (p. 130).

The authors then illustrate unfolding with the opening of Schubert's Impromptu Op. 142, measures 1-4 (see my Ex. 2). In this example, the unfolding occurs between the first two notes of the compound melody, initiated in the first measure with the leap of a third D to B♭. The unfolding here is such a local phenomenon that it is perhaps more intuitive to verticalize it in a graph, just as the authors verticalize the A to E♭ of the dominant seventh harmony in the next

Example 2: *Analysis of Tonal Music*, Example 6.4, pp. 129-130



measure. The brevity of the explanation and the single musical example, in this case, do not provide enough information for students to assimilate this new concept or to grasp the practicalities of using unfolding signs in their own graphs. At no time do the authors discuss how to draw the unfolding sign, nor do they provide any additional examples.

In contrast, Forte and Gilbert discuss unfoldings at three different stages in their text: first, there is an introduction to the topic (pp. 159-164); second, the topic is reviewed under the heading "unfoldings of small scale" (pp. 251-257); and finally, the authors introduce several examples of "unfoldings of larger scale" (pp. 257-260). In total, Forte and Gilbert's explanation encompasses approximately fifteen pages of text, thirteen musical examples, and nine student exercises. And at the outset, they provide directions for drawing the unfolding sign:

> It is symbolized graphically by an upward stem on the lower note, a downward stem on the upper note, and a crosswise beam connecting the two. The upper note's downward stem permits it to take un upward stem as well, plus any other analytic symbol that may be appropriate (p. 160).

While this may seem obvious, it is not at all evident from the single example and discussion that Cadwallader and Gagné present. In general, students gain a fuller understanding of unfoldings after reading Forte and Gilbert, and these pages provide a much-needed supplement to Cadwallader and Gagné's treatment of the topic.

The student exercises at the end of Chapter 6 may also give the teacher reason to return to Forte and Gilbert's text. Considering the amount of new material covered in this chapter and its vital importance, the following prescription for student exercises seems inadequate:

> For centuries composers and other musicians have copied scores, not only to obtain a personal copy, but also as a way of learning the music thoroughly. This practice continued long after scores were commercially available. Similarly, Schenker would ask students to copy a graph so as to understand better both its notation and its meaning. It is an excellent way to improve both your understanding of graphs and your ability to recreate them.

> Copy some or all of the graphs in this chapter. As you copy the foreground graph and then a subsequent middleground graph, think carefully about the relationship of the two: what is retained and what is left out; how the notation changes on higher levels; what is shown about the overall structure of the phrase. Be prepared to discuss each graph in detail, and the technique it illustrates (pp. 153-154).

While one cannot argue with the wisdom of this approach, it should be remembered that at this point in the text–if the teacher has followed Cadwallader and Gagné's course of study somewhat faithfully–the student has created few Schenkerian graphs. Up to this point, the student exercises have involved annotating musical scores with Roman numerals and figured bass, labeling diminutions, placing stems on structural notes, and identifying linear progressions or linear intervallic patterns. Only in Chapter 5 do the students finally graph miniature fundamental structures in short musical excerpts. Chapter 6, therefore, needs to continue this "hands-on approach" to allow the student to practice the new notation, before moving onto the larger musical examples of Chapter 7 (which closes the first semester of study) and the complete movements analyzed in the second half of the text.

From this perspective, the copying exercises at the end of Chapter 6 seem rather meager and, once again, the corresponding material in Forte and Gilbert provides a useful complement. For most of the topics presented in Chapter 6 by Cadwallader and Gagné, Forte and Gilbert offer exercises consisting of short musical excerpts for the student to graph, accompanied by commentary to help with possible areas of difficulty. Their format for student exercises is also teacher-friendly in that they provide all of the musical examples, whereas Cadwallader and Gagné cite only the name of the work and the relevant measure numbers.

While Cadwallader and Gagné's approach in Part 1 may be problematic, Part 2 of their text provides a much stronger discussion of Schenkerian fundamental structure and musical form than Forte and Gilbert. Chapters 8 through 12 present "One-Part Forms," "Binary Forms," "Ternary Forms and Rondo," and "Sonata Principle," each of which is illustrated with three to five Schenkerian analyses of complete movements. In these chapters, the analyses "emphasize the higher levels of fundamental structure" (p. 197), while the

authors demonstrate how Schenker's notion of structure intersects with more common terminology for musical form. Part 2 begins with "One-Part Forms," which in Schenkerian terminology describes "a structure that has no high-ranking internal division (such as that provided by interruption)." The authors continue:

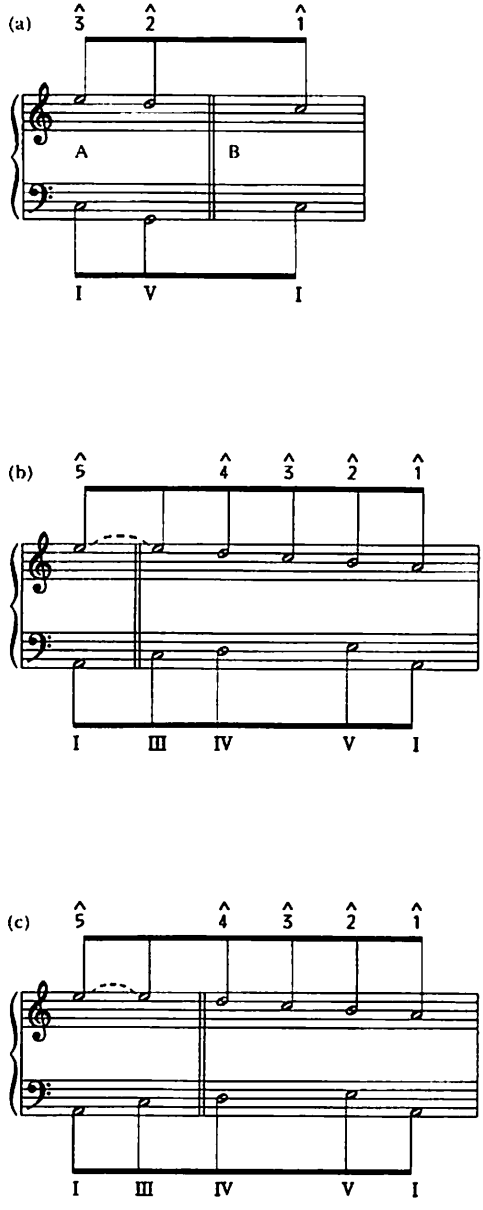
> ...a one-part form may be thought of in structural terms as a single cadential progression that serves as the basis for a complete work. This structure will be expanded and embellished in the compositional process, but remains essentially undivided (pp. 219-220).

Therefore, all of the musical examples in this chapter illustrate these undivided descents. Already this is more logical than the corresponding chapter in Forte and Gilbert's text, where the chapter on one-part forms confusingly discusses interruption. Cadwallader and Gagné continue to avoid any potential ambiguity in terminology in the following chapters on Binary and Ternary Forms. Here it is made admirably clear that binary and ternary forms can embrace either one-part (undivided *Ursatz*) or two-part (interrupted *Ursatz*) structures, and the presentation of "Some Characteristic Tonal Patterns" at the end of these chapters (see my Example 3) shows the different ways the *Ursatz* (undivided or divided) may or may not coincide with the traditional divisions of these forms.

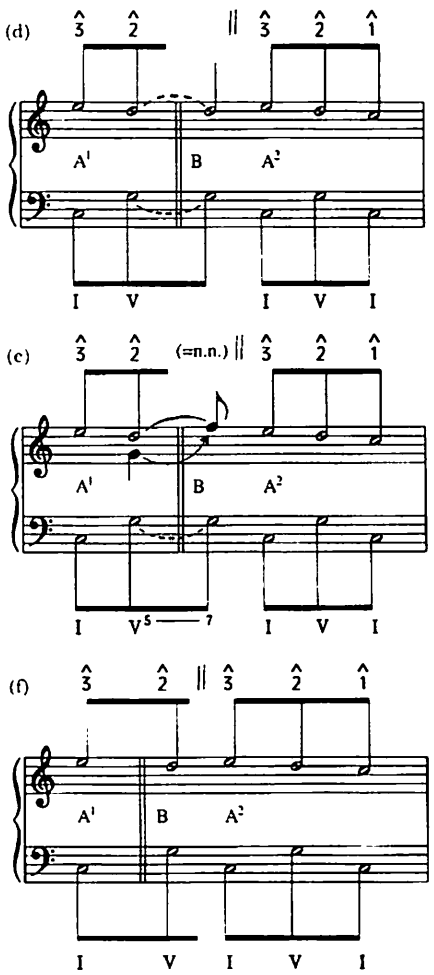
In general, the authors present their analyses of complete movements with engaging prose. In addition to discussing higher levels of structure, the authors also enthusiastically describe some of the more unusual aspects of the musical foreground and how they relate to Schenkerian concerns. This helps to enliven their written analyses which, as is always the case with Schenkerian analysis, have the potential to become somewhat dry and technical. In general, the students I have taught prefer to read these analyses rather than those in Forte and Gilbert, which tend to be written in a less engaging style.

A final suggestion arises in the chapter on "Sonata Principle," where it would have been useful for the authors to revisit their analysis of the first movement of Beethoven's Piano Sonata, Op. 2, No. 1 first presented in the Introduction (pp. 3-13). These opening pages introduce–in everything but name–the concept of motivic parallelism. As an introduction, this chapter is unusual; it neither intro-

Example 3: *Analysis of Tonal Music*, Example 9.15, pp. 246-247



Example 3: *(cont)*



duces Schenkerian theory nor provides a logical connection or progression to the following chapters, and it describes a topic that is never revisited throughout the course of the book. Although the authors suggest to the reader that, "[a]fter you have read this book, you may wish to return to this piece and study Schenker's original analysis" (p. 4), they do not follow this suggestion themselves. The chapter on "Sonata Principle" would seem to be an opportune moment for the authors to revisit this analysis. By doing so, they could formally introduce the topic of motivic parallelisms, reinterpret the analysis of the introductory chapter in Schenkerian notation, and illustrate how to incorporate motivic parallelisms within a Schenkerian graph. This might offer a logical point to conclude the analytic portion of the book, and provide an opportunity for the authors to come full circle in their introduction to Schenkerian analysis.

But this is a minor flaw in what is otherwise a valuable text. Cadwallader and Gagné's book ably manages to overcome many of the deficiencies that were manifest in Forte and Gilbert's introduction, notably their discussion of Schenkerian structure as it pertains to musical form. And while neither textbook can claim to be the authoritative introduction to Schenkerian theory, the two used in conjunction may provide the student with a thorough grounding in its principles and analytic techniques.

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

Reviewed by David Butler

The book makes an ironic first impression. When you pick it up initially, you can't help thinking that its massive title (truncated from this point on to *Aural Skills Acquisition*) seems misplaced on an octavo-sized book, not quite two centimeters thick. But the title is much more appropriate than you first suspect. *Aural Skills Acquisition* is not just one more aural skills manual, filled to the edges with specimens for sight-singing and dictation. Rather, its focus is the pedagogy of aural skills and its range comes credibly close to the breadth suggested by the title.

The book's eight chapters are collected under two major headings. Part I, slightly more than half the book's length, is titled "Listening Skills"; Part II is entitled "Reading and Performing Skills." These two headings are intended to be broader than the typical "ear training" and "sight singing" staples of the aural skills classroom, however. The former is intended to cover skills beyond music dictation, and the latter involves not just correct conversion of visual code to sound, but skilled reading and literate, tonally savvy performance.

The musical scope of the book is confined to common-practice Western metric and tonal idioms, which makes a tacit statement that it is a sensible first step in a much-needed series. The discussion is supported by almost 300 references, drawing from the literatures of aural training, historical musicology, music theory and analysis, and music cognition.

Listening Skills

The first chapter, "Identification of Basic Features," discusses six fundamental characteristics of musical sound (texture, timbre, tessitura/register, tempo, dynamics, and articulation) that—the author asserts—listeners can learn to identify at the earliest stages of musical study. The rationale for including a discussion of these foundational characteristics isn't entirely clear: although instruction in recognizing variations in these characteristics is considered optional in the college-level aural skills curriculum (p. 11), it is then suggested that the topics really should be somehow interwoven with, or covered concurrently with, topics in later chapters. But if listeners can identify these musical characteristics at the earliest stages of musical study, shouldn't we assume that college-level musicians are past this stage of musical development? What is a reasonable lower limit of college-level musicianship, and what should be considered remedial? J. David Smith's 1997 article, "The place of musical novices in music science," gives a psychologist's perspective on cognitive skills that could be considered in separating complete musical novices from what we might agree to designate minimal musical/aural competence for college-age musicians. Smith's discussion also gives the reader a sense of how rare this level of minimal competence—not to mention the level of expertise we want to see in our successful students—is in the general population.

Chapter 2 is entitled "Preliminary Listening Skills," discussed under the broad headings "Pulse and Meter" and "Pitch." Karpinski's presentation of the temporal aspects of music follows a familiar and reasonable simple-to-complex progression of topics and instructional tactics. This progression begins with the segmentation of time first into regular and neutral "pulses" using tapping / clapping activities and simple meta-notation, and continues through discussions of meter and hypermeter to a discussion of rhythmic notation. The foundational discussion of pitch begins with extensive coverage of the process of pitch-matching, and progresses to generous discussions of pitch memory, tonic inference, perception of melodic contour, identification of scale-degree, and finally to iden-

tification of intervals. The order of topics in this discussion carries the implicit but powerful message that notational and/or systemic primitives don't necessarily turn out to be the best materials with which to begin an aural skills tutorial. "Melodic" and "harmonic" dyads may be easy for the instructor to present and grade as dictation exercises. That certainly doesn't mean they are the easiest aural constructs for students to identify—or that they are even musically realistic, at least when presented (as they typically are) in isolation from any musical context. Discussions of aural recognition of scale types, the relationship of solmization systems and listening skills, and absolute pitch complete the chapter.

Karpinski makes a convincing case at the outset of Chapter 3, "Melodic Dictation," that dictation's intrinsic complexity, from the pedagogue's perspective, is its Achilles heel. Musical dictation demands a tangled web of responses involving (at the very least) aural perception, immediate recall of what has just been (is now being) heard, recognition of idiomatic scalar/tonal, registral, durational, and metric information, and the student's fluency with notational conventions. When a student errs on a dictation exercise, which one or several of these factors—or some factor not listed here—is responsible? The discussion in this chapter—as in the previous chapter on preliminary listening skills—lays out a careful compilation and analysis of the many component skills that must be combined to produce fluent and accurate dictation. The discussion then goes on to suggest teaching strategies that take the complexity of the learning task into account. Throughout these chapters, Karpinski is both liberal in supporting discussions with relevant evidence from the research literature of music cognition, and appropriately critical of that research and the extent to which it bears on aural training.

Chapter 4 covers polyphonic and harmonic dictation, and is one of the shorter chapters in the book. This rather cursory coverage is probably not because these forms of aural training are less important, or that either is particularly easy to do. One likely reason for the brevity of this chapter is that musically sophisticated experimental reports on polyphonic and harmonic perception are actually quite scarce. The author is thus forced to base his discussion on the more-anecdotal pedagogical literature. The discussion of har-

monic dictation, for example, is a compendium of short sections covering instructional activities such as real-time arpeggiation of heard chords; concentration on the bass line; recognition drills for chord inversions; and recognition drills for chord qualities.

Chapter 5 offers a brief overview of other listening skills that can and should be integrated with the more-traditional classroom and lab activities—but which instead are often abbreviated and sometimes missed completely because of time constraints. These include transcription (using recorded and sometimes live performances); instrumental playback; error detection/correction; listening to moreextensive features such as higher-level hypermeter and large-scale formal attributes; listening to (and recognition of) nontonal pitch collections; and aesthetic attributes of musical process and performance.

This valuable and all-too-brief chapter touches on some of the hot-button issues in music cognition research as it discusses aural skills that should get much more attention in the classroom and lab, if instructors could just find the time. Karpinski points out, for example, that perceptual research reports (e.g., Cook 1987; Marvin & Brinkman, 1999) indicate that—with the exception of certain experts—listeners are largely unaware of large-scale key relationships. When even a fairly short piece of music ends in a different key from which it began, very few listeners are aware of that fact. These test results seem not to have been warmly embraced by Schenkerian specialists. It has also been argued (e.g., Thomson 1991, 1993) that listeners are similarly incapable of identifying even small and simple collections of atonal pc-sets, and perceptual evidence (e.g., Gibson 1986) supports that assertion as well. These are important challenges to the standard analysis-based, scorecentric genus of music theory instruction that predominates in U.S. colleges and universities, and should be stimulating further research and discussion.

We can also respond, through our aural training pedagogy, to the apparent challenges raised in these perceptual studies. For example, students can dramatically improve their abilities to recognize large-scale formal processes and key relationships when they hear them, without benefit of following a score—based at least on the anecdotal evidence of my own teaching for many years. One third of the grade in my introductory forms course reflects students'

abilities to produce accurate phrase structure graphs of entire movements (starting with short pieces such as Beethoven bagatelles and eventually progressing to large sonata and sonata-rondo movements) without a score. Students are instructed to graph the formal properties of phrase length, motivic content, cadence type, and key relationship. They typically begin each exercise and test with a beginning outline similar to that shown in Figure 1. The movement to be graphed in this example is the third (minuet) movement of the Beethoven Sonata No. 1, op. 2 no. 1.

Students are instructed to indicate phrase beginnings and ends with brackets; to identify primary motivic content for each phrase with a standard alphabetic code above the opening bracket (point 1 in Fig. 1); to indicate the length of the phrase by number of measures at point 2 in this figure; and to indicate the cadence at point 3. After 3 or 4 hearings of this movement, even the most intimidated student very likely has graphed this much of it.

Figure 1: Beginning aural analysis bargraph for Beethoven Sonata No. 1 in F minor, op. 1 no. 1, III.

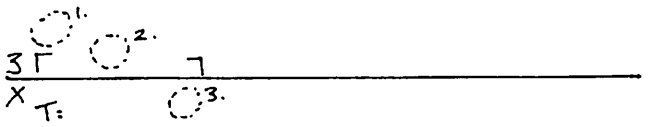
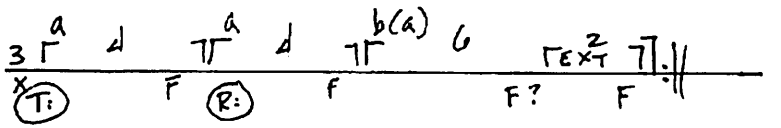


Figure 2: Bargraph for the first three phrases of Beethoven Sonata No. 1 in F minor, op. 1 no. 1, III.



By emphasizing relativity and avoiding absolute labels for meter, phrase lengths, key levels, and cadences, the analytic task becomes feasible for students without appealing to absolute pitch or divine intervention. This is to say that without the score, students can only make a best guess as to absolute identities of several musical characteristics. For example, the aural hints as to the meter of the Beethoven movement are obviously triple, but the beat unit is a matter of guesswork when one does not have access to the score. Phrase lengths can be specified in varying numbers depending on similar aural inference: when the listener has no prior knowledge of the beat unit, phrases in the Beethoven example may be inferred to be either two or four measures long. Either choice can be accepted as correct for this analysis, provided the student is consistent: the first two phrases are equal in length for example, and the numbers at the midpoints of the phrases should reflect that. The third phrase is equal in length to each of the first two, but then is extended by a repeated cadence so that it ends half again as long.

At least at first, students can be encouraged simply to decide whether cadences are final or non-final; in either case, students are forced to make a relative key-level judgment in order to make that generic identification of cadence. Being able to graph correct specific cadence labels may be worth extra credit. In this example it was given that the piece started in the tonic key area. At the surface level at least, there is a shift away from tonic in the second phrase (although the motivic content is identical to the first), and remains in that key throughout the remainder of this repeated phrase group. This is graphed in this example with the letter "R" which, quite handily, can stand for both [closely] Related or Remote. Classroom listening sessions in which students aurally ferret out formal characteristics and processes with these simple bar graphs often turn out to be the first time that students really begin to synthesize and apply much of the information they have absorbed in their earlier music theory classes. In fact, much of the material presented in separate sections of Chapter 5 turns out to be nicely integrated in large-scale aural analytic activities such as this. These activities should also allow students to begin to develop the sense of *Fernhören* that Karpinski discusses late in the final chapter, in his discussion of reading Schenkerian graphs.

Reading and Performing Skills

Chapter 6 counterbalances Chapter 2: in Chapter 6 Karpinski describes important characteristics of the music reading, solmization, and performance skills that complement the fundamental listening skills discussed in the earlier chapter. One important example of these characteristics can be illustrated as follows: aural skills instructors regularly hear the old student lament that goes something like, "I could sing this melody perfectly if I didn't have to use those stupid syllables!" The student doesn't yet realize that this statement is true in the narrow sense but that it misses the point in a larger, more sophisticated musical sense. In a call-response activity using neutral vowels, a student can produce a vocal imitation of the sound of a melody without having any idea whatsoever of how to notate it, or how to describe any of its tonal contents with any degree of precision. Karpinski quotes Michael Rogers's (1996) important distinction between sight reading and sight singing, and the distinction is so important that it bears repeating here. "The real goal of sightsinging is not just accuracy; it is to hear the music in a particular way—a way that is musically nuanced, that is shaped and directed by goals, and a way that respects the encoded tensions and internal-movement proclivities of the specific environment. The job of sightsinging is context sensitivity and the enculturation of *tonal bearings*." (147, emphasis original) In the remainder of this chapter and in Chapter 7 (Sight Reading), Karpinski proceeds in the same systematic fashion as in Chapters 2 and 3 to identify and discuss the many smaller skills we group under the rubric "sight singing." Again, Karpinski cites relevant findings from music cognition research to frame and support his suggestions.

Over half of the final chapter, "More Complex Reading Skills," is devoted to singing and understanding chromatic inflections, and modulation. The remainder of the chapter presents brief discussions of proportional tempo and metric juxtaposition, clefs, transposition, score reading, conducting, and the reading (and aural comprehension) of Schenkerian graphs. Some of these topics are more complex and do build on skills discussed in earlier chapters, but this is not true of all of them. For example, most sight-singing manu-

als present chromatically altered tones before their halfway point, and students are typically required to begin drilling on altered solfége syllables at that time. Some instructors begin very early in the aural skills program to require that students conduct the class in singing examples from the sight-singing manual—not to be graded on their conducting, but to be evaluated instead on the accuracy and completeness of their report of the errors they heard while conducting.

It does not seem hyperbolic to state that this is a pivotally important contribution to the literature of music theory pedagogy. It is the first English-language book devoted entirely to aural skills pedagogy, and as such it is an important complement to Michael Rogers's seminal *Teaching Approaches in Music Theory* (1984). Moreover, throughout this book Karpinski relentlessly pushes the field of aural training pedagogy beyond the methods-and-materials status quo. He has drawn heavily, and critically, on research findings in the field of music cognition, and this book makes a convincing case that musicians stand to benefit by paying careful attention to this literature. The writing is clear, careful, and unfailingly accessible—the author obviously knows that his readership will consist in large measure of readers who do not conduct research in the area of music cognition, for example. But those in the music cognition community also would do well to pay attention to this book, because it lays out a number of issues that are meaningful to musicians. This an important point to recognize, because music cognition research currently does not have as great an impact in the college music profession as it now enjoys in the scientific community. Increasing numbers of cognitive scientists have been attracted to the research field of music cognition because music offers them a complex, rule-based auditory realm with the gilt-edged characteristic that it is non-verbal. As such, it avoids the potentially confounding lexical and cultural baggage that speech-based auditory perception research is forced to carry. But the scientist's research agenda is not necessarily the same as the musician's, and it is no great accomplishment to find studies in this literature that are musically flawed, musically simplistic, or simply musically irrelevant. Books such as *Aural Skills Acquisition* set a musically important research agenda for music cognition research.

Aural Skills Acquisition can be regarded as a first step in two major respects. First, because its scope is limited to aural skills trained on music of the Western tonal/metrical tradition, the book invites similar treatment of aural skills pedagogy dealing with post-tonal and non-Western idioms. And second, each discussion in this book based on anecdotes from pedagogical experience—rather than on solid experimental evidence—should be interpreted as an invitation (even a challenge) to those working in the area of music cognition research. We can only hope that, as a series of next steps, future editions of *Aural Skills Acquisition* will be able to take advantage of the results of more—and more musically sophisticated—empirical research. One final point: a vanishingly small number of book reviews compliment the editor. This is one. For over two decades now, Maribeth Anderson Payne has had a clear sense of emerging ideas and issues in the field of academic music. She has repeatedly benefited our field through her willingness to take risks to give those ideas and issues a chance to develop in the pages of the book projects she nurtures.

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Aural Skills, Pedagogy, and Computer-Assisted Instruction: Past, Present, and Future

Reviewed by Deron McGee

In his 1959 book, *The Sleepwalkers*, Arthur Koestler states:

> The symptom that a particular branch of science or art is ripe for change is a feeling of frustration and malaise, not necessarily caused by any acute crisis in that specific branch. . .but by a feeling that the whole tradition is somehow out of step, cut off from the mainstream, that the traditional criteria have become meaningless, divorced from living reality, isolated from the integral whole.[1]

The essence of this statement resonates deeply with many of our students with respect to aural skills classes. When asked about their individual aural skills experiences, a large proportion of students "admit that they disliked it, thought they were bad at it, and have found it largely irrelevant to their subsequent engagement in music."[2] As George Pratt points out, "either many musicians should have taken up other careers. . .or else the content and methods of aural training and testing are inappropriate to their presumed purpose of developing musical perceptions."[3] This sentiment is not new as Paul Hindemith observed in 1946:

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[1]Arthur Koestler. 1959. *The Sleepwalkers* New York: Macmillan, p. 520.

[2]George Pratt. 1998. *Aural Awareness*, revised edition. New York: Oxford University Press, p. 1.

[3]ibid.

> Sometimes excellent musicians are not able to write down even comparatively simple dictated examples, while frequently musicians of inferior quality easily reproduce elaborate dictations. This shows that the ability to follow musical dictation is not necessarily an index of the degree or quality of musical talent, any more than the memory of numbers, the gift to imitate others' actions, or the sense for spatial direction are essential for general intelligence.[4]

Developing the ability to "think in music" is one of the stated goals of many aural skills programs. Just as a poet cannot forego an understanding of grammar and syntax, theory provides a similar foundation for music. In turn, as a poet's words are comprehended by an individual listener, so should the musical sounds and their relationships received by a trained musician. Terms such as "the hearing eye" and""the seeing ear" embody this concept and dictation plays an important role in this process. Hindemith continues:

> On the other hand it cannot be denied that the complete absence of such ability [taking dictation] is at least an unfavorable indication of the state of a musician's amount of knowledge. It is therefore necessary to develop it—whatever its amount or quality may be—to the utmost, just as all other parts of his gift must be developed.[5]

A primary challenge for us as instructors is to provide opportunities for students to transfer the skills from one area of learning to another. Based on the comments of Pratt's students, this is something we do not do well. Howard Gardner notes that it is not a problem only in music when he states:

> Researchers at Johns Hopkins, M.I.T., and other well-regarded universities have documented that students who receive honor grades in college-level physics courses are frequently unable to solve basic problems and questions encountered in a form slightly different from that on which they have been formally instructed and tested.[6]

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[4]Paul Hindemith. 1946. *Elementary Training for Musicians*, New York: Associated Music Publishers Inc., p. 185.

[5]ibid.

[6]Howard Gardner. 1991. *The Unschooled Mind*. New York: Basic Books, p. 5.

Transfer is not automatic. Knowledge and skills developed in one context will not necessarily carry over into another without instructors developing a rich series of connections for the students. Scholarship in the cognitive sciences and brain research from the past two decades is beginning to illuminate some of the basic operations of the brain, yet few musicians have attempted to bridge that research with teaching aural skills. A notable recent exception is Gary Karpinski's book, *Aural Skills Acquisition*,[7] which draws on such research and starts building such a bridge. By understanding how the brain operates, we can begin to develop more sophisticated theories of learning and by extension refine our materials and methods of teaching.

The Past

With the advent of microcomputers in the late 1970s and their widespread dissemination in the early 1980s, many educators became enamored with the possibilities of this new tool. Historically, educators have been drawn to the light of new technologies, often with amazing predictions of how such technologies will revolutionize teaching and learning. Whether we are discussing the role of textbooks, film, television, or computers, great expectations regarding their impact on teaching have been the rule rather than the exception.

Some of the earliest computer-assisted instruction software, based on a simple drill-and-practice model, began to emerge in the late 1970s with basic ear training exercises as subject matter. Intervals and chords have clearly identifiable right and wrong answers, a quality that lends itself to automation. However, the vision of many early instructors was limited by the capabilities of the computer. Rather than creating a vision for teaching and then implementing it on the computer, most instructors (I count myself among them) were woefully limited by the computers in terms of memory, storage options, and processing speed. My first computer (a TRS-80) had 8K of RAM and a cassette tape for storage. Within the first few years, the Apple II sported up to 64K of RAM and limited processing speed. With

[7]Gary Karpinski. 2000. *Aural Skills Acquisition*. New York: Oxford University Press.

these tools, it is no wonder that instructors developed programs to fit within these constraints, since the higher order processing required to identify shades of gray in student responses was not possible.

In the middle and late 1980s, several computer programs became available for ear training. Programs such as *Music Lab, Practica Musica, MacGAMUT, Melodic Dictator,* and *Ear Training Expert* were in use. One serious problem when writing software "in the good old days" was the incompatibility of Macintosh and Windows computers. Programs written on one platform were not easily translated to operate on the other. All of the programs listed here were written for a single platform.

As we move through the 1990s, compatibility between the Macintosh and Windows platforms became easier with new development tools and the widespread use of the internet. The internet essentially neutralizes all platform issues, since any computer with a browser can connect and interpret data from a specific type of server, which brings us to today.

The Present

For this review, I have selected four current cross-platform programs. Some of them have been around for some time, such as *Practica Musica* (Ars Nova Software) and *MacGAMUT* (Music Software International, Columbus, Ohio), while others are relatively new to the scene, such as *CASPAR* (W.W. Norton, New York) and *Music for Ear Training* (Wadsworth, Belmont, CA). The philosophies behind the programs can be spilt into two groups. First, *Practica Musica* and *MacGAMUT* each expand on the initial drill and practice model by developing computer-based assessment of the student work and providing additional feedback during the process. They also both build on a mastery learning model. The other two programs return to a philosophy of creating prepared examples to dictate for students, much like the practice tapes that accompanied ear training texts of the 1970s, and one provides a series of quizzes for which the student cannot be shown the answers. The grading of the dictation exercises becomes the responsibility of the instructor, rather than the computer. Each philosophy has merit and can be effective based on the context in which it is used.

One conspicuous absence from this review is *Auralia* (Rising Software). My review copy of *Auralia* was damaged and a replacement did not arrive before the deadline. Further, a quick search of the internet reveals literally hundreds (if not thousands) of ear training programs that drill aural skills for Windows, Macintosh, and general web browsers. A definitive survey of all available programs would be immense; therefore this review has been limited to four currently available, cross-platform programs.

Practica Musica

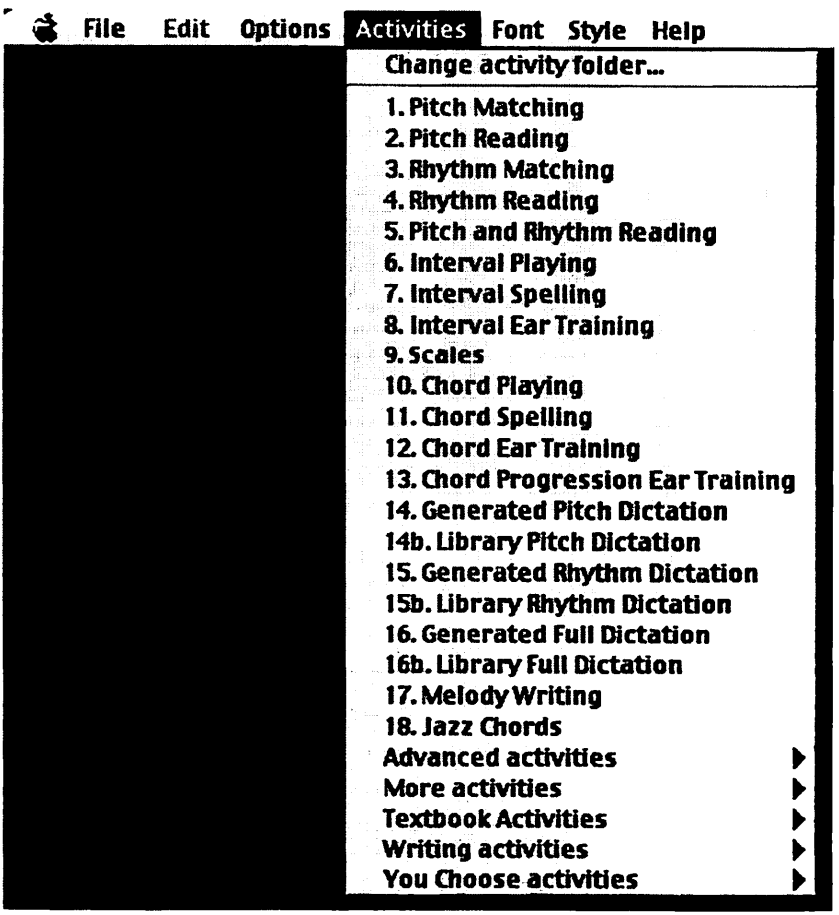
Introduced in 1987, *Practica Musica* is one of the earliest commercially-available music programs to incorporate a substantial amount of ear training. The philosophy behind the program is to combine drill-and-practice exercises in constructing the elements of music (intervals, scales, chords, etc.) and ear-training exercises, all scored by the computer. It employs a mastery learning strategy, with four levels of mastery within each activity and as many as six sublevels for each major level. The package includes a music fundamentals textbook for single users, but the company also offers renewable student files for multiple users running from a single server as a site license. A single user version of *Practica Musica* sells for $125, while the site licenses start at $600 for 50 renewable student files. Additional student files may be purchased in lots of 10 for $4 each. The current version, 4.465 as of press time, represents a substantial improvement from the previous 3.x version. Minor updates and support are available on the company web site (www.ars-nova.com) for registered users.

The program supports both internal sounds and MIDI. Students can enter answers to some exercises, such as rhythmic and melodic dictation, on a MIDI keyboard. Other exercises requiring the student to spell intervals and chords must be entered on the computer screen. An element retained from the original version is a basic analytical system that identifies the intervals and chords as one plays the MIDI keyboard. An interesting feature from earlier versions that allowed the exercises to be heard in a variety of tuning systems has been removed in the current version.

Each activity in *Practica Musica*, as shown in Figure 1, requires students to accumulate a series of points before reaching mastery. When the level is completed, the student is greeted with a round of sampled applause and allowed to continue into the next level. (The applause can be quite annoying after the first or second time.)

The program generates melodies, rhythms, and harmonic progressions and also allows for examples from the literature to be included in the libraries. In melodic dictation, the program checks pitch only, places the correct rhythm in the example, and provides

Figure 1. Activities Menu from *Practica Musica*



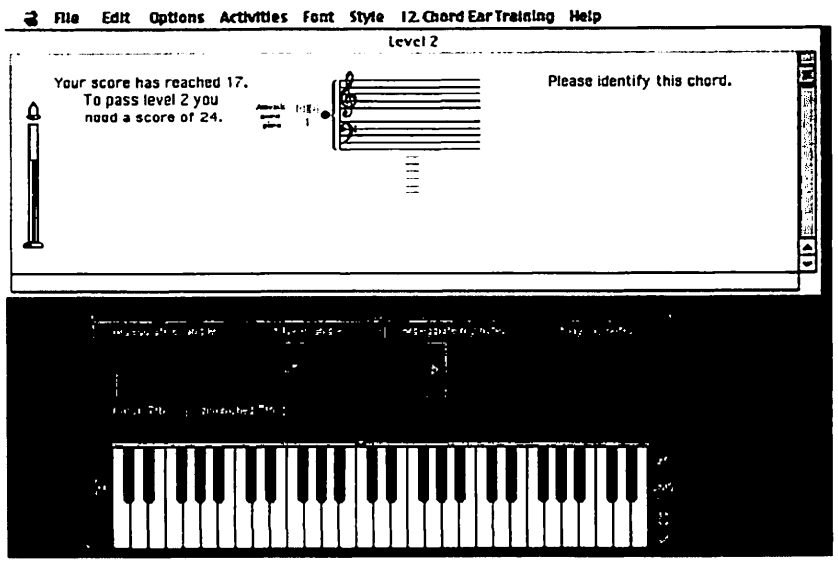
limited feedback. The generated harmonic dictation examples are adequate in general, but they do not always make complete musical sense, especially in the shorter exercises. The longer the excerpt, the better the progression. In the rhythmic dictation activities, the program only checks for proper performance placement of the downbeats and durations within the example. In this case, the assessment and reporting algorithms are more sophisticated, but the feedback is still relatively simple, identifying such things as a late onset of a note, a note not held long enough, and so forth. Nevertheless, the rhythmic performance element is probably the strongest asset of this program.

One frustration involves the default penalties for wrong answers. Figure 2 shows the chord identification screen with the student working on level 2, where a score of 24 points is required to pass this section. The default setting for a wrong answer is to reduce the points by half for each error. This can be particularly frustrating for a student with 23 points and happens to "mis-click" an answer, reducing the points to 12. Fortunately, in this version of the program the instructor controls are much improved over the past versions and the point deductions, if any, for incorrect responses can be adjusted.

The instructor has remarkable flexibility when designing or modifying activities. He or she can create new activities, decide what materials to include at each level or sublevel, identify the type of question, the form of the input from the student, create and import new libraries of music to use as examples, and much more. The instructor can also define how an exercise is to be scored within a limited range of parameters, which allows for some input into the way the computer interprets the score. The program does not provide for more complex assessments. For example, when scoring melodies, the program cannot recognize contours or transpositions and incorporate those elements into the overall score. Finally, such flexibility has to be balanced with the time it takes to design, develop, and implement new exercises. While designing new exercises is not difficult, it is time consuming.

The current version allows students to practice at any level, a substantial improvement over earlier versions that required students to progress through each level before even attempting something

Figure 2. *Practica Musica* Level 2 of Chord Ear Training



more advanced. *Practica Musica* reports the activity of each student by highlighting sections mastered and also indicating "time on task" for each activity. Individual students can keep track of their records and send the file to the instructor. In the site license version, all files are stored in a central location.

Practica Musica serves a general audience, therefore many of the activities do not reach the depth and breadth of examples of some of the other programs being reviewed here. If you need reinforcement of music fundamentals while developing aural skills then *Practica Musica* may be an adequate choice, however the price is prohibitive for most students.

MacGAMUT 2000

MacGAMUT 2000 features the most sophisticated assessment mechanisms of the programs under review. While it does not have the polished look of the other packages, it more than makes up for that with content, design, and flexibility. The philosophy behind the program is similar to that of *Practica Musica* in that it includes a combi-

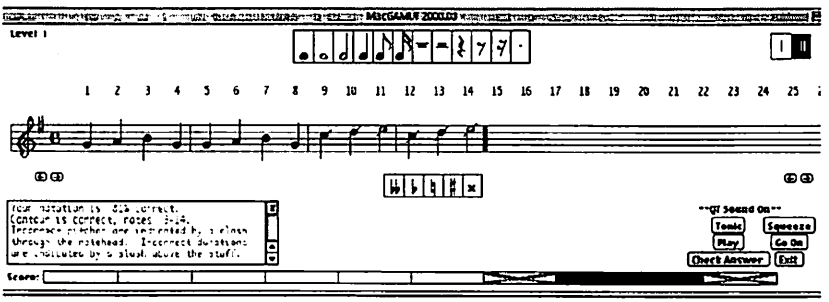
nation of drill-and-practice exercises in constructing the elements of music (intervals, scales, chords, etc.) and ear-training exercises all scored by the computer. It also employs a mastery learning model, although with much more detail and depth. *MacGAMUT* incorporates 18 levels of intervals, 10 levels of scales, 14 levels of chords, 18 levels of melodic dictation, and 20 levels of harmonic dictation in the basic configuration alone. Each student purchases a student disk (currently $35 each), registers with the web site (www.*MacGAMUT*.com), and receives a student file via e-mail. The student file is the key to *MacGAMUT* since the program will not run without it. Support and minor upgrades are available at the company web site for registered users.

The program supports both internal sound and MIDI, however the Macintosh version was not completely USB compatible as of press time. Interestingly, the program functions quite well without MIDI due to the unique circumstances under which it developed. Through an administrative decision, the music lab where students were testing the earliest version of the program had Macintosh computers, but no MIDI keyboards. Of necessity, the programmers developed an interface that works remarkably well without the keyboard.

Each level of exercises has a regular and practice setting. When attempting to demonstrate mastery of a particular level, the student must complete 8 of 10 exercises correctly (the number may be adjusted by the instructor). When assessing the melodic and harmonic dictation, the program incorporates quite sophisticated analysis algorithms to determine "greater errors" from "lesser errors" as an overall score is determined for the exercise. Figure 3 shows a melodic dictation example where the computer identifies the correct contour even though the pitches are incorrect, a error students commonly make. *Practica Musica* simply counts the pitches wrong with no further feedback, whereas *MacGAMUT* identifies the type of error and shares the information with the student. The program still counts the pitches as incorrect, but the larger-scale patterning that *MacGAMUT* can identify reaches a step beyond the other programs.

MacGAMUT does not have a separate rhythmic dictation section. Rather, rhythm and pitch are evaluated simultaneously when

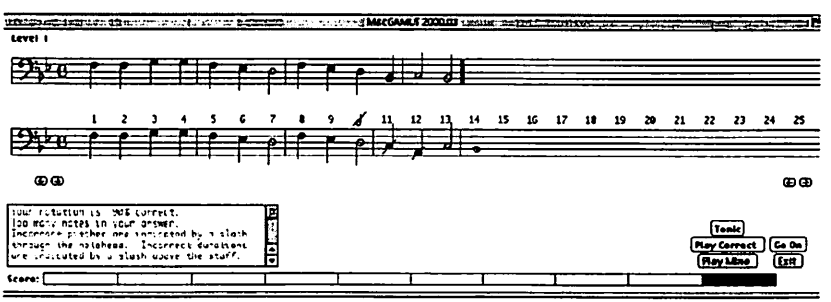
Figure 3. *MacGAMUT* Melodic Dictation Example



the melodic dictation exercise is scored. Figure 4 shows an example of a melodic dictation exercise containing a rhythmic error and a couple of pitch errors. The program scored this particular melody at 90%, presumably accounting for the "lesser error" of a missed duration and added notes than missed pitch and duration. By not separating rhythm from melody, this program more accurately represents how we perceive music, but more importantly requires an integration of concepts not required in the other programs.

Figure 5 shows an example of a student answer, the correct answer, the incorrect elements, and the overall score of a harmonic dictation exercise. The screen includes a feedback box on the left-hand side of the screen that indicates the error(s), buttons on the right-hand side that allow students to hear their example and the original to make comparisons, and a tracking bar on the bottom of

Figure 4. *MacGAMUT* Melodic Dictation Example

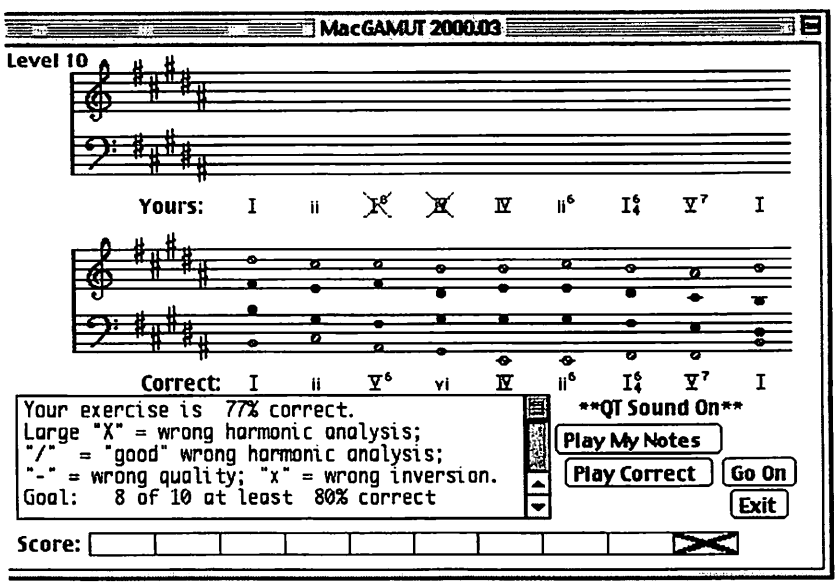


the screen tracks the number of correct answers out of the last 10. As the student moves to the next exercise, the red X in the tracking bar box on the right-hand side of the screen will move one place to the left. When 8 of 10 boxes turn green, representing correct answers, the level has been mastered.

The instructor can determine the number of examples needed for mastery, the percentage of the example elements that must be correct to be counted as a pass, and a variety of other parameters through programs available on the instructor disk. Instructors can create additional melodies, harmonic progressions, scale patterns, interval exercises, and so forth. The process is extremely flexible, intuitive, and very functional.

MacGAMUT does not have real-time rhythmic dictation exercises, as does *Practica Musica*. The advantage of such exercises can be found in developing timing, arguably the most important factor in musicality, rather than rhythmic identification and understanding. Such a series of exercises would be a welcome addition to future versions of this fine program.

Figure 5. *MacGAMUT* Harmony Exercise



Computer Assisted Software Project for Aural Skills Reinforcement (CASPAR)

A new addition to the body of ear training programs is *CASPAR*, developed by Eric Lund at the University of Illinois and published by W.W. Norton in New York (www.wwnorton.com). The program is designed to coordinate with Leo Kraft's *New Approach to Sight Singing*, 2nd Edition (W.W. Norton, New York) and also to serve as a stand-alone program. The philosophy behind *CASPAR* differs dramatically from the previous two programs in that the computer does not score any of the exercises. Rather, the computer provides single line melodies and harmonic exercises in the form of SATB chorales and the student writes the dictation on manuscript paper. The program is organized into four sections of melodic and four sections of harmonic exercises with each unit consisting of eight or nine lessons. When students purchase *CASPAR* (currently $31.50), they receive a CD-ROM with 260 graded exercises. *CASPAR* supports internal sound and MIDI, with the exception of USB MIDI on the Macintosh in this version.

Figure 6 presents the melodic dictation screen for *CASPAR*. All melodies have the key signature and starting pitch given. Beginning in the lower left-hand side of the screen, the metronome can be adjusted by the student with or without a count off measure. The harmonize button will play a tonicization pattern in the key at any time. The student can select specific measures for playback, the playback controls are self-explanatory, and the tempo can be adjusted.

CASPAR provides on-board help featuring partial or substantial guidance with the task at hand through the view tabs at the top of the screen. The tonic tab will indicate every location of tonic in the melody, while the 1-3-5 and 5-7-2-4 tabs indicate the locations of the scale degrees of the tonic and dominant harmonies, respectively. The rhythm tab will show the rhythm of any or all of the measures. The contour tab highlights shapes, and the implied harmony tab reveals possible harmonizations of the scale degrees present. The hints tab reveals one or more hints depending on the complexity of the melody and finally the entire answer can be revealed with the answer tab.

Figure 6. *CASPAR* Melodic Dictation

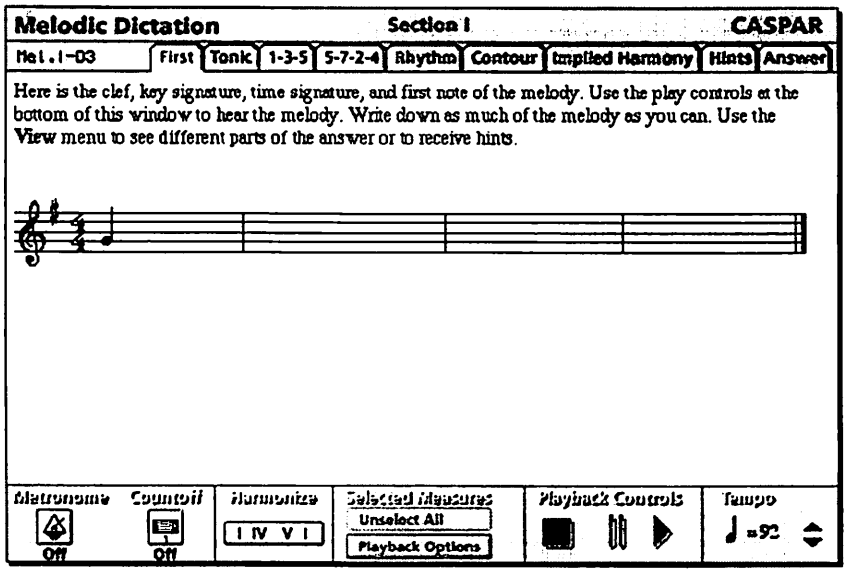


Figure 7 shows *CASPARS*'s harmonic dictation screen from a dictation exercise in the fourth section of the program. The controls at the bottom of the screen are consistent in all of the exercises, and the top of the page allows the student to listen to any or all voices in any combination by turning them on or off with the speaker icons. Since this exercise modulates, there are two rows for the analytical symbols and function identification. Figure 8 shows the answer(s) to this particular exercise.

CASPAR keeps a progress report for each student as shown in Figure 9. It tracks the complete time on task, the number of hearings (full and partial), and the amount of help requested based on each help item. The progress reports can be sent to instructors along with the completed exercises.

This type of program can be useful in the right circumstances with dedicated students willing to put forth the effort to honestly engage the learning process that such a program facilitates. It also moves the grading from the computer to the instructor, so the exercises can be scored using the teacher's own rubrics. However,

Figure 7. *CASPAR* Harmonic Dictation, Level 4 Exercise

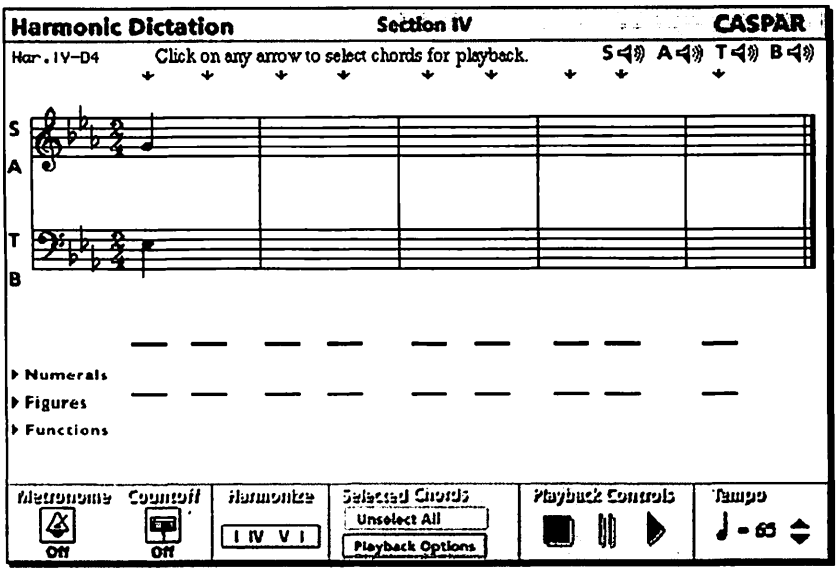


Figure 8. *CASPAR* Harmonic Dictation, Level 4, Answer

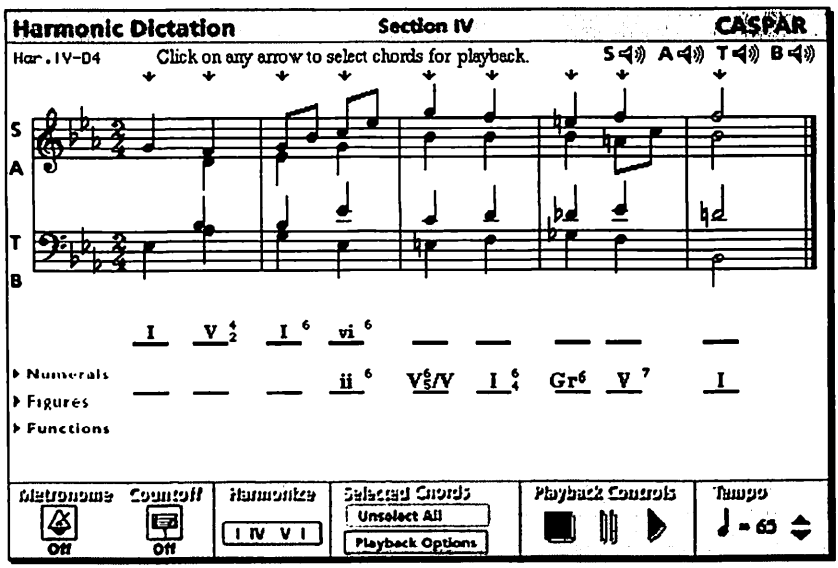
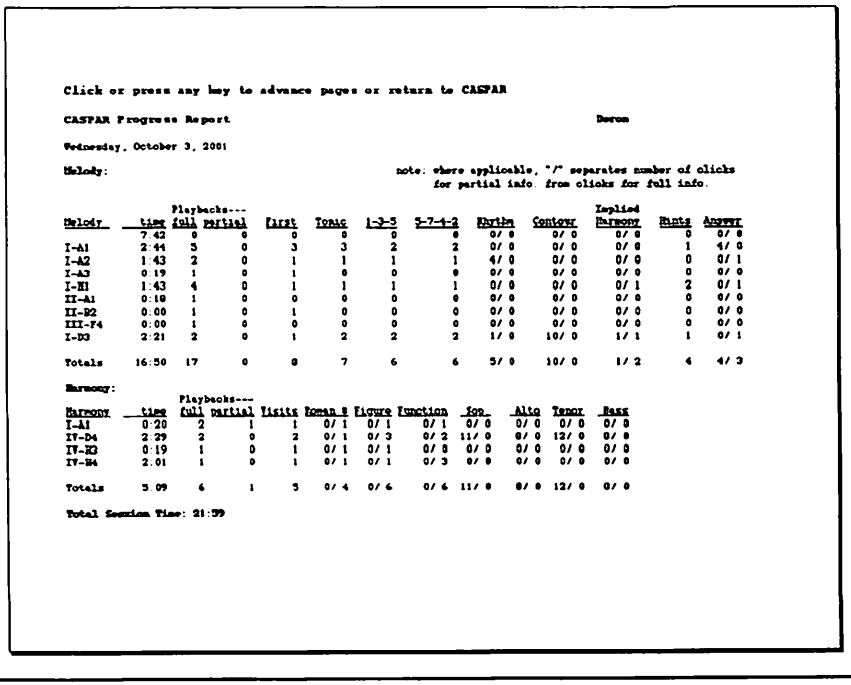


Figure 9. *CASPAR* Progress Report



Click or press any key to advance pages or return to CASPAR

CASPAR Progress Report — Doron

Wednesday, October 3, 2001

Melody: note: where applicable, "/" separates number of clicks for partial info. from clicks for full info.

Melody	time	Playbacks--- full	partial	First	Tonic	1-3-5	5-7-4-2	Rhythm	Contour	Implied Harmony	Hints	Answer
	7:42	0	0	0	0	0	0	0/ 0	0/ 0	0/ 0	0	0/ 0
I-A1	2:44	5	0	3	3	2	2	0/ 0	0/ 0	0/ 0	1	4/ 0
I-A2	1:43	2	0	1	1	1	1	4/ 0	0/ 0	0/ 0	0	0/ 1
I-A3	0:19	1	0	1	0	0	0	0/ 0	0/ 0	0/ 0	0	0/ 0
I-B1	1:43	4	0	1	1	1	1	0/ 0	0/ 0	0/ 1	2	0/ 1
II-A1	0:18	1	0	0	0	0	0	0/ 0	0/ 0	0/ 0	0	0/ 0
II-B2	0:00	1	0	1	0	0	0	0/ 0	0/ 0	0/ 0	0	0/ 0
III-F4	0:00	1	0	0	0	0	0	0/ 0	0/ 0	0/ 0	0	0/ 0
I-D3	2:21	2	0	1	2	2	2	1/ 0	10/ 0	1/ 1	1	0/ 1
Totals	16:50	17	0	8	7	6	6	5/ 0	10/ 0	1/ 2	4	4/ 3

Harmony:

Harmony	time	Playbacks--- full	partial	Visits	Roman #	Figure	Function	Sop.	Alto	Tenor	Bass
I-A1	0:20	2	1	1	0/ 1	0/ 1	0/ 1	0/ 0	0/ 0	0/ 0	0/ 0
IV-D4	2:29	2	0	2	0/ 1	0/ 2	0/ 2	11/ 0	0/ 0	12/ 0	0/ 0
IV-E2	0:19	1	0	1	0/ 1	0/ 1	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0
IV-B4	2:01	1	0	1	0/ 1	0/ 1	0/ 3	0/ 0	0/ 0	0/ 0	0/ 0
Totals	5:09	6	1	5	0/ 4	0/ 4	0/ 6	11/ 0	0/ 0	12/ 0	0/ 0

Total Session Time: 21:59

CASPAR has some shortcomings. First, it does not provide any exercises to serve as quizzes where the material is not presented to the student. Second, it does not lighten the burden of grading exercises. Finally, the limited number of examples could be a problem for students who need additional work. The 260 examples average to just over four melodic and four harmonic dictation exercises each week over a two-year, 15-week/semester sequence. While that may be an appropriate number for some students, others may need many more exercises based on strength of their musical background.

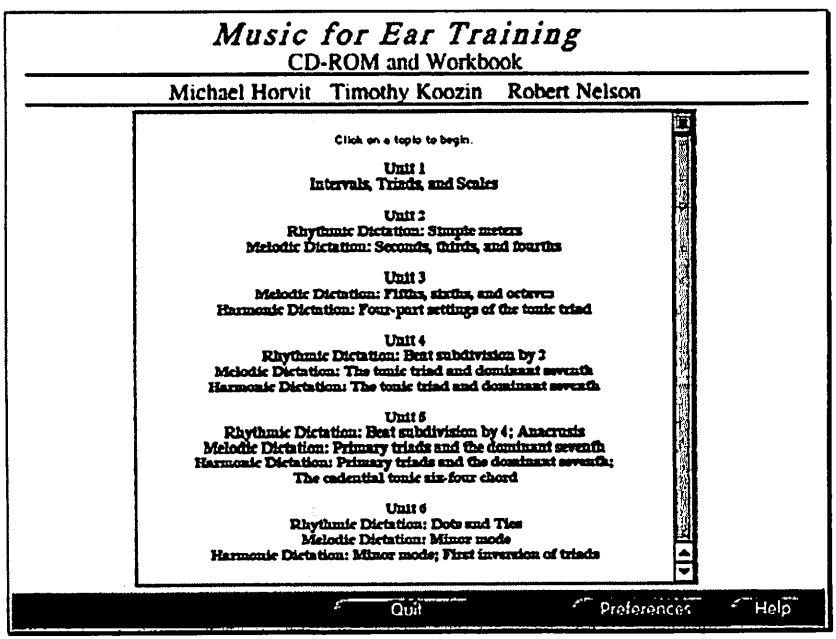
Music for Ear Training

Another new addition to the body of ear training programs is *Music for Ear Training*, designed by Tim Koozin at the University of Houston and published by Wadsworth (www.wadsworth.com). The program coordinates with Benjamin, Horvitt, and Nelson's *Music*

for Sight Singing, 3rd Edition (Wadsworth) and serves as a stand-alone workbook with software. The philosophy behind *Music for Ear Training* is similar to *CASPAR*. The computer provides melodic, harmonic, rhythmic, and transcription exercises. The CD-ROM is packaged with a spiral bound workbook with perforated pages. The workbook contains printed blank staves that coordinate with the exercises on the CD-ROM. The book and CD-ROM set currently costs $42.26 and can be purchased directly from the Wadsworth web site. Figure 10 shows the first page of the main menu indicating the first six of seventeen units. Many units are divided into harmonic, melodic, and rhythmic dictation exercises, while Units 10, 14, and 17 are dedicated to transcriptions from music literature. *Music for Ear Training* uses several good internal sounds and supports all MIDI devices.

Figure 11 shows the melodic dictation screen. Students can adjust the tempo in the lower left-hand portion of the screen with playback controls at the bottom center. They can hear the tonic pitch

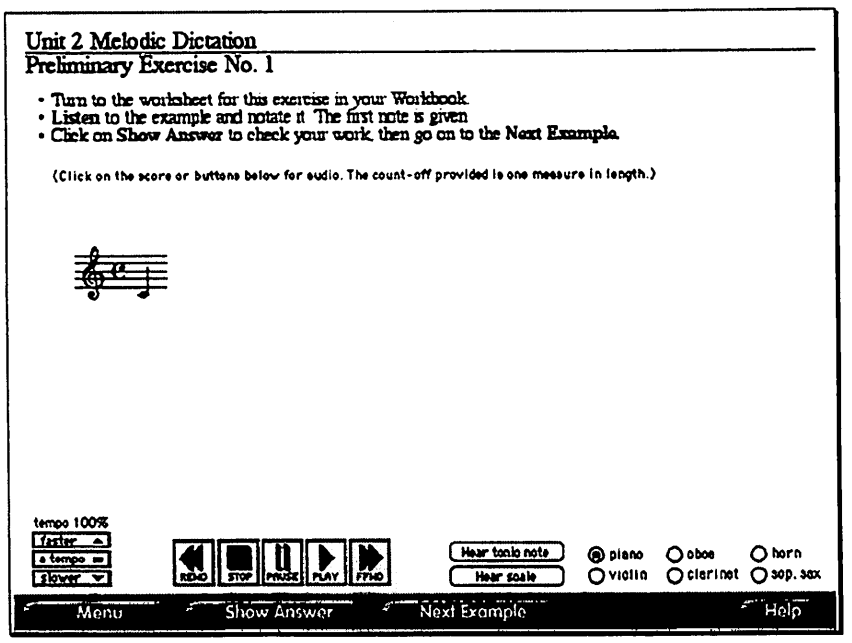
Figure 10. *Music for Ear Training* Main Menu



and a tonic scale. On the bottom right-hand portion the student can select one of the six timbres for listening. The students write the dictation in the workbook and turn it in to the instructor for grading. An Annotated Instructor's Manual with the same CD-ROM is available containing the notated examples, which is a tremendous benefit for the instructor. While grading the exercises is still time consuming, the instructor does not need to copy the dictation exercises from the computer before she can begin the grading process.

Each melodic unit includes a series of preliminary exercises and a series of melodies. For example, the first unit contains 18 sets of preliminary exercises with about 14 exercises per set, 14 sets of melody exercises with about 14 melodies per set, and 3 sets of quizzes with 5 melodies per set. The Annotated Instructor's Manual shows the first set of melodies, however the computer has an additional 19 sets for practice! In total, the program has over 1200 graded examples. The three sets of quizzes at each level, for which the computer does not give the student the answer, are printed in the An-

Figure 11. *Music for Ear Training* Melodic Dictation

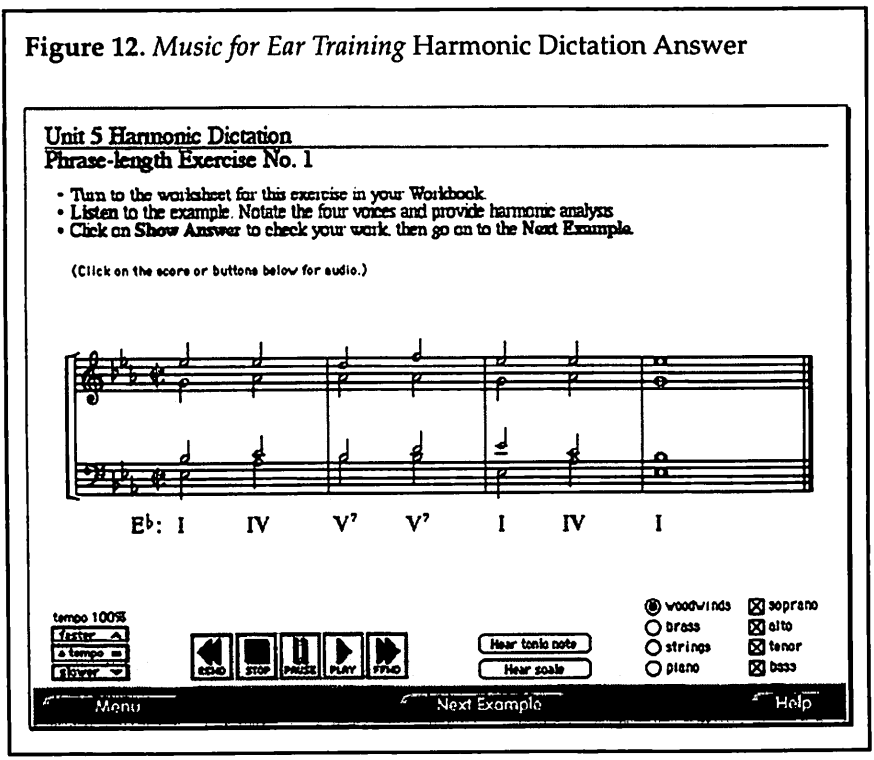


notated Instructor's Manual. The rhythmic dictation exercises in Unit 2 provide 14 sets of material and three sets of quizzes.

Figure 12 shows a phrase-length harmonic dictation example from Unit 5. The program features "basic progressions" and phrase-length exercises at each level. The basic progressions at this level are four or five chords and serve as building blocks for the phrase-length examples. At the earliest levels the basic progressions contain only two chords and as the phrase length progressions become more complicated, gradually additional chords are added to the preliminary exercises. Students can change the timbre for the example and play any combination of voices by selecting the corresponding boxes.

Units 10, 14, and 17 contain excerpts from music literature (see Figure 13). The examples include over 50 excerpts by composers such as J.S. Bach, Mozart, Haydn, Kuhlau, Chopin, Beethoven, Schubert, Glinka, and Grieg just to name a few. The excerpts come from a variety of genres, including solo piano works, quartets, quin-

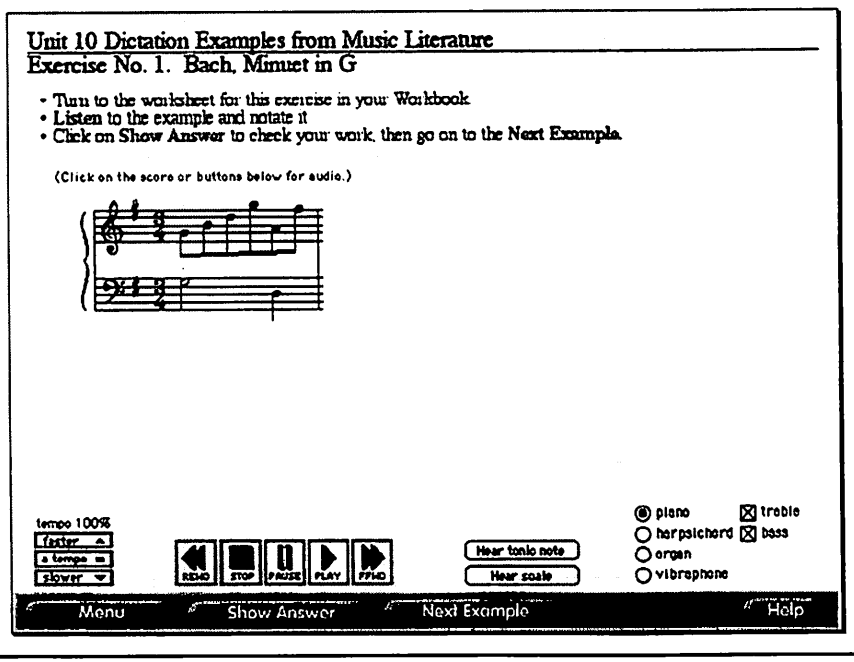
Figure 12. *Music for Ear Training* Harmonic Dictation Answer



tets, chorales, and others. The transcription exercises take students one step beyond traditional four-voice chorale-style dictation and requires them to address issues of texture, registral space, and larger-scale listening and begin to make connections from the critical listening skills to larger-scale musical contexts that appear to be missing for many of our students.

Music for Ear Training does not track student progress in the manner of the other programs. Rather, the students' work is the documentation of their progress. The combination of writing the music down with the immediacy of computer feedback provides a powerful model for dictation. By writing the music down, this program more closely emulates the dictation process that happens in class.

Figure 13. *Music for Ear Training* Dictation from Music Literature



Future

The programs reviewed here represent a tremendous leap forward from the earliest ear-training programs from the late 1970s and early 1980s. Computers today are much more powerful in terms of speed and memory, and the software development systems are friendlier and easier to learn and use. The computer has become a required tool, rather than an experimental device, throughout our society. Today, instructors can use computers to implement their pedagogical vision, rather than having that vision constrained by the limitations of the technology.

All of the programs reviewed here can be used effectively in teaching aural skills. However, the relatively limited context in which the exercises arise ultimately handicaps the instructor and the software. Without developing richer musical contexts in which to ground our students' experiences, we are doomed to continue the pattern of dissatisfaction reported by both Pratt and Hindemith.

The problem that Gardner identifies with physics also applies to music: students do not automatically transfer what they learn in aural skills classes to other aspects of their musical lives. The challenge for us as aural skills instructors is to draw on the growing brain and cognition/perception research, develop teaching materials and techniques consonant with that research, and express a vision of how to build the rich network of connections for each of our students such that they can relate critical listening skills to their other musical activities.

We live in a world of gray, yet many of our ear training programs developed during a time when computer technology limited the designers to assessing "black and white" questions. Often, the most powerful, profound, and enduring learning emerges from engaging what Michael Rogers colorfully calls the "Rich Messiness of Music."[8] The challenge for the next generation of software developers is to explore this "messiness," developing a vision of the rich network of connections necessary to bring about our stated goals by engaging the gray, and implementing tools to help us and our students grow as musicians.

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[8]Michael Rogers. 1990. The rich messiness of music: Teaching theory in music with contradiction and paradox. *College Music Symposium*, 31, p. 131-141.

Conference Report: *MusicCog / 2001*

Reviewed by David Temperly

MusicCog/2001, which took place at Ohio State University on May 18-20, 2001, is the latest in a series of workshops held at Ohio State on the subject of music cognition (previous workshops were held in 1998 and 1999). The MusicCog workshops differ from conventional conferences in several respects. First, all speakers are invited: they consist of renowned scholars in music cognition from around the world, as well as researchers from Ohio State's own distinguished music cognition group. (Five guest speakers at MusicCog/2001 gave one or two talks each; six Ohio State speakers also gave talks.) Secondly, a series of panel discussions interspersed with the talks allow an unusual degree of participation and input from the audience. Thirdly, the workshops are free, making them an ideal forum for students or others wishing to "get their feet wet" in the exciting field of music cognition.

The atmosphere at MusicCog/2001 was relaxed and intimate. There were generally about 50-70 people in attendance at any given time; at a guess, I would say roughly half of those present were students. While the Ohio State contingent was large, many other institutions were also represented; I spoke with people who had come from as far away as Nevada and the United Kingdom.

Several of the papers at MusicCog/2001 had implications for music pedagogy. Elizabeth West Marvin explored the teaching of aural skills, with specific regard to students with absolute pitch. As Marvin noted, the rare and much-valued ability of absolute pitch can in fact be a hindrance, as it tends to discourage the development of relative pitch and fluency with intervals and harmonic func-

tions. Marvin advocated an approach to aural skills pedagogy which is suitable for both AP- and non-AP-possessors. This method is based largely on using scale-degree numbers to refer to pitches, and involves frequent changes of key, so that AP-possessors must get used to changing their frame of reference according to the context.

A much-discussed issue in music education today is the effect of musical training and activity on other abilities. Two papers at MusicCog/2001 shed important new light on this issue. William Thompson reexamined the so-called "Mozart effect": the alleged short-term enhancement of spatial-reasoning tasks by exposure to classical music. In an attempted replication of the Mozart effect, Thompson found that listening to classical music could indeed lead to improved performance on spatial tasks; however, Thompson argued that this effect was mostly explained by the fact that certain kinds of music enhance mood and arousal, which in turn enhance spatial reasoning. (It was found, for example, that faster-tempo music improved spatial-task performance more than slower-tempo music.) A talk by Eugenia Costa-Giomi examined the long-term effect of musical training on a number of variables including quantitative and spatial reasoning ability, as well as social and personality measures such as self-esteem. Costa-Giomi noted that, while other studies have shown that students participating in music and other arts tend to have higher academic performance, such studies have generally been only correlational. Costa-Giomi undertook a controlled study in which an "experimental" group of Montreal school children were given three years of piano lessons while a "control" group was not. The performance of the experimental group on quantitative/spatial reasoning tests and other measures was significantly better than the control group after two years; after three years, however, there was no longer a significant difference. In Costa-Giomi's view, this may suggest that musical training mainly serves to accelerate intellectual development that will eventually occur anyway. However, Costa-Giomi stressed (and others agreed) that the entire idea of trying to justify music education by appealing to its enhancement of other abilities is misguided; music education should be valued for its own sake.

A recurrent theme in the papers at MusicCog/2001 was the issue of differences in perception among listeners. Emmanuel Bigand

explored differences in perception due to training, arguing that these have often been overstated. In a study where subjects rated melodic tension at points in a melody, musically trained and untrained subjects proved remarkably similar in their judgments; in both cases, judgments reflected sensitivity to tonal stability, not just relative to the local context but to the larger context as well. (Bigand's second talk, relating to harmonic priming, reached a similar conclusion regarding the sensitivity of both trained and untrained listeners to tonal context.) By contrast, Paul von Hippel's talk drew attention to a possible difference in perception due to training, in the area of melodic expectation. Von Hippel's concern was with two hypothesized rules of melodic expectation: post-skip reversal (change of direction after a skip) and step momentum (continuation in the same direction after a step). Von Hippel found that both of these rules were reflected in expectancies of trained listeners much more strongly than untrained ones. Von Hippel also argued, however, that these perceptual strategies are best regarded as "heuristics", since it is doubtful (based on statistical analyses of melodies by Von Hippel and Huron) that either principle is operative in the way melodies are actually constructed.

In a similar vein, Bill Thompson's first talk also argued for important differences between trained and untrained listeners. The broader theme here was transfer: the carryover of skills from one cognitive domain to another. Thompson wondered if trained musicians' sensitivity to pitch would result in an increased sensitivity to intonation even in speech; an experiment suggested that it did. Trained and untrained subjects (non-Spanish speaking) were played recordings of Spanish speakers who had been told to read Spanish sentences in a happy or sad manner; remarkably, trained listeners interpreted the intended emotion much more accurately than untrained listeners. One final talk concerned with differences in perception was by Jamshed Bharucha. Using magnetic resonance imaging, Bharucha studied brain activity of American and Indian subjects (trained in the US) when listening to Indian or American music. American subjects showed increased brain activity when listening to American music only; Indian listeners showed increased activity for both American and Indian music—not surprisingly, given their familiarity with both kinds of music. A multi-dimensional scal-

ing analysis of brain activity during these trials showed a clear separation between American and Indian listeners.

The topic of music performance was not neglected at MusicCog/2001. Caroline Palmer presented a study of "displacement" errors in piano performance, in which a note is played at a location other than the correct one. She found that the probability of a note being played erroneously at a certain location depends on the distance between the played location and the correct one, and also—most interestingly—on the similarity in metrical strength between the two locations: a novel and compelling demonstration of the role of meter in our mental representations of music. Focusing on a very different population, Udo Will presented research on the music of the Pitjantjatjara ethnic group of Central Australia. Since—in Will's view—the Western concept of a'"note" is not really applicable to this music, spectral analysis was used to study its pitch organization. Despite the absence of notation, singers from this group demonstrate an extraordinary consistency in their performances, down to the most subtle nuances of pitch—as Will confirmed by examining the pitch distributions of different performances.

Two papers on the final morning of the workshop dealt with the issue of timing. Emendine Penel began by considering a peculiar phenomenon of perception: the spatial realm tends to be dominated by vision, while temporal perception is dominated by audition. This phenomenon was further explored in a study in which subjects were presented with a pulse represented both auditorily (by a repeated tone) and visually (by a dot moving back and forth across a screen). When the visual and auditory pulses were shown separately, people seemed more sensitive to slight irregularities in the auditory pulse than in the visual one; when both were shown together, judgments of the regularity of the composite pattern were more affected by the auditory pulse. Finally, Mari Jones's talk dealt with the effect of timing on attention. She reported experiments showing that judgments of pitch in a same-different task depended on the timing of the comparison pitch relative to a previously-established pulse; this confirms Jones's theory that rhythmic patterns establish "attentional pulses" which guide attention to future events.

MusicCog/2001 was organized by David Huron, who presented a very stimulating and entertaining talk of his own on the subject of timbre. Huron asked the question, is the mental representation of timbre a dimensional one (in which a sound is represented as a point or points in a dimensional space) or a featural one (in which sounds are represented as clusters of features)? Huron argued for the latter view; the way to understand timbre, he suggested, may be by probing its ecological origins—namely, our need to interpret the sounds in the world around us. For example, if low-frequency sounds sound more threatening to us than high-frequency sounds, this may be because they suggest larger resonating bodies—for example, a larger animal (or person) versus a smaller one.

As well as talks and discussions, MusicCog/2001 featured tours of the impressive music cognition facilities in the School of Music and psychology department at Ohio State; posters were also shown presenting music cognition research by Ohio State graduate students.

Coming away from MusicCog/2001, one could not help but be impressed by the high standard of work in the field today, the atmosphere of optimism and excitement, and the collegial and open-minded way in which ideas are presented and debated. Anyone wishing to keep abreast of developments in music cognition is urged to keep their eyes open for the next MusicCog...which I understand is tentatively slated for 2003.

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