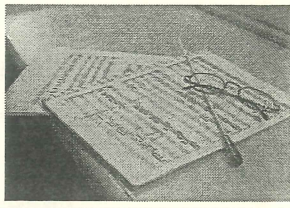
Developing Elementary Harmonic Ear Training Exercises for Music Majors : An Approach Based on Root Motion Theory and Drill Technique



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Abstract

It is agreed among music educators that ear training in music programs is essential for success. The goal is to provide music students with critical listening skills that they will use routinely for the rest of their lives. In a good curriculum harmonic ear training is taught in combination with basic music theory. In real situations harmonic ear training skills tend to be neglected and in general, students have more problems doing harmonic ear training.

The objective of this research was to develop elementary ear training exercises for music majors that uses root motion principles and drill technique, and to investigate if the method improved the accuracy of the subjects' ear training skills.
The method was then tested with a sample group of 17 music major students using a pre and post test design. All students had previous ear training education to a certain degree.
The results of the study showed a mean score of 64.82% at the pretest and 85.36% at the post test, an average increase of the mean after treatment of 20.54%.

บทคัดย่อ

นักการศึกษาด้านดนตรีให้การยอมรับว่า แบบฝึกการฟังฮาร์โมนี เป็นหัวใจสำคัญสำหรับความสำเร็จด้านดนตรี เพื่อพัฒนาทักษะการฟังแก่นักศึกษาอย่างมีคุณภาพ และนำไปใช้ให้เกิดประโยชน์สูงสุด หลักสูตรการสอน แบบฝึกหัดการฟังฮาร์โมนีจะประสบความสำเร็จได้ดี ต้องสอนควบคู่ไปกับวิชาทฤษฎีดนตรี แต่ในปัจจุบันหลักสูตรการสอนดนตรี ให้ความสำคัญน้อยกับการสอน แบบฝึกหัดการฟังฮาร์โมนี จึงส่งผลกระทบทำให้นักศึกษามีปัญหาด้านการฟังทางเดินคอร์ด

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การศึกษาวิจัยครั้งนี้ ผู้ศึกษาวิจัยมีวัตถุประสงค์เพื่อสร้างแบบฝึกหัดการฟังพื้นฐานทางเดินคอร์ดสำหรับนักศึกษาดนตรีโดยอิงทฤษฎีรูทโมชั่นและแบบฝึกหัดทำซ้ำ แล้วทดสอบว่านักศึกษาได้มีการพัฒนาขึ้นด้านการฟังฮาร์โมนี

ผู้ศึกษาวิจัยได้ทดสอบแบบฝึกหัดดังกล่าวกับกลุ่มทดลองคือ นักศึกษาเอกดนตรี 17 คน ผลการศึกษาวิจัยพบว่า ค่าคะแนนเฉลี่ยจากแบบทดสอบก่อนการทดลองคือ 64.82% ค่าคะแนนเฉลี่ยจากแบบทดสอบหลังการทดลองคือ 85.36% แสดงให้เห็นถึงการพัฒนาของกลุ่มทดลอง ซึ่งได้ค่าคะแนนเฉลี่ยสูงขึ้น 20.54%.

Background and Rationale

Ear training is part of every serious music education program. It is agreed among music educators that ear training in specialized music programs is essential for success. (Deutsch, 1971) In a good curriculum ear training is taught in combination with basic music theory and harmony. They should complement each other and be coordinated because ear training is the practical implementation of the music theory.

Rogers (1984) emphasizes the interrelationship between thinking and listening in the study of music theory: "the more thinking that takes place, the more there is to hear; the more listening that takes place the more there is to ponder". He goes on to explain that musical analysis centers on this cyclical relationship, leading the student to question how and why a particular piece of music "works", which further leads the student to query how it might have been composed, and, subsequently, how it should be performed, heard, or taught.

Aural harmonic skills tend to be neglected. Alvarez (1980) compared scalar with root harmonic perception techniques. He states that current basic music series including state curricular guides tend to emphasize the development of notational rather than aural harmonic skills. Particulary when contrasted with presentation of rhythm and melody, harmony appears to be neglected. If harmonic aural perception is presented at all, it tends to be limited to the identification of isolated chords and arpeggios. His results show a superiority of the scalar method but admits that this could have been due to the implicity of the procedure itself. Also the target group was 7 and 8 graders in high school, not music majors.

Funk (1975) and Hofsetter (1987) found that students frequently exhibit confusion regarding the peception of the acoustical root of chords. Their abilities to perceive the roots of the chords is affected by the changes in range, dynamics, doublings and context.

For non musicians it is quite impressive how a trained musician, in only a few seconds, is able to correctly recognize chord progressions. The fact of being able to correctly translate a giving chord into musical notation is part of a complex process which needs to be educated. A theoretical music background is definitely needed to successfully do aural recognition of chords and chord sequences.

According to Levitin the problem is that our brain has limits on how much information they can actively keep track of. "...the working memory is severely limited, generally to nine pieces of information. (Levitin, 2006) Levitin (2006) states that musicians use a process called 'chunking'. "Chunking refers to the process of tying units of information into groups and remember the group as a whole rather than the individual pieces. First, musicians encode in memory an entire chord, rather than the individual notes...second, musicians tend to encode sequences of chords, rather than isolated chords. "Plagal cadence", "twelve bar blues" or "turnaround" are shorthand labels that musicians use to describe sequences of varying lengths. ...allows them to recall big chunks of information from a single memory entry."

David Salisbury (1990) points out that "recent research on cognitive learning suggests that the role of drill and practice in learning may be more important than has previously been realized. Furthermore the drill technique is a time efficient method especially where subskills are involved.

In ear training subskills are used extensively. For example practicing hearing chord qualities is a subskill that needs to be addressed first to be able to proceed to a more difficult task, hearing chord progressions because chord progressions are build from chords.

Most music educators essentially agree that the fundamental ear training material to be used for music majors should have its roots in the music literature coming from the common practice period. (Klonoski, 2006, Choksky, 1986, Salzer, 1962)

The music of the common period is enormous and the harmonic material presented is vast. We need a way to present the essence of the music of this period in a visual way in order to derive exercises from that material.

Root motion theory is a practical approach that promises that each chord's characteristics can be explained by a shared set of allowable root motions. (Tymoczko, 2000) Bach mentioned the concept of root motion already in his few theoretical writings (Michelson, 2006) but it was Rameau who was the first to put these ideas into words in his book 'Traitè de l'harmonie' (Rameau, 1722). It was further developed by educators such as Schoenberg (1969), Meeus (2000) and others.

Music educators emphasize the interrelationship between thinking and listening in the study of music theory: "the more thinking that takes place, the more there is to hear; the more listening that takes place the more there is to ponder". Rodgers states that learning how to hear a sound in its contextual relationship and knowing its meaning is crucial. It is even more important even than getting the right note. Right answers can even be irrelevant or harmful if these are heard without the appropriate listening habits.

A well-rounded ear-training program needs to include between sound events (requiring just ears) and musical events (requiring ears and minds). This involves the understanding of musical relationships and for teaching purposes implies--almost demands--a 'holistic approach'.

"The distinction is between letting sound simply strike the ear drum and plugging that sound into conceptual frameworks." (Rogers, 1984).

My solution is to develop elementary harmonic ear training exercises using an approach based on root motion theory and drill technique to implement the exercises and up to today has not been used in an ear training class as an instructional tool.

The strategy I use is to complement the drill techniques with the root motion approach, in other words, adding the root motion approach in order to achieve a more complete and broader hearing experience. Complementing the drill technique with a root motion theory provides a holistic approach that allows the students to hear in a musical context.

Root motion provides a simple visual representation of harmonic movement because it classifies all progressions in three simple groups: strong[1], weak and superstrong progressions.

The fact that it is simple and visual is pedagogically relevant and stimulates learning. I therefore designed eight ear training lessons in harmonic exercises that apply root motion theory and use drill technique and will implement these lessons with a selected group of music majors and expect that the accuracy in harmonic ear training will be improved by implementing my method.

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[1] Schoenberg (1969) also called them ascending (strong), descending (weak) and superstrong. Meeus gives other names for the same classification being dominant (strong) and subdominant (weak) progressions.

Objectives of the Study

1. To develop eight lessons of harmonic ear training exercises using root motion theory and drill technique in order to improve the student's accuracy in elementary harmonic ear training skills.

2. To investigate whether the method improved the accuracy of the subjects' ear training skills.

Scope of the Study

This research addresses issues in the field of elementary harmonic dictation. The study focuses on the development of harmonic exercises and the implementation with a group of music major students that had already basic ear training and a basic theoretical background, meaning general music notation, Roman numeral notation, diatonic chords, melodic intervals, rhythmic dictation, chord quality identification, cadences and basic chord progressions.

The sample group consisted of 17 volunteer music major students that were selected by purposive sampling.

Limited harmonic material was used during this research. Only tonal triadic harmonies from the diatonic major scale are considered as used in the music of the Common Practice period. The diminished chord was not included because of its close theoretical relationship to the V7 chord. Chord progressions consisted out of a maximum of four chords.

Hypothesis

I expect that after implementing the eight lessons the level of accuracy of the subject's harmonic ear training skills will have improved in terms of chord progressions recognition. The level of accuracy is acquired from a pre test (T1) and a post test (T2). For the hypothesis to hold true the value of T2 needs to be higher than the value of T1. ($T2 - T1 > 0$) (Kiasuda, 2006)

Ear training drill method

For reasons of convenience ear training and analysis are usually treated as two topics within music theory but should be taught as one. Kolonoski (2006) states that traditional dictation exercises isolate elements such as rhythm, melody and harmony. This is done to develop the student's listening skills from by constructing the whole from parts; first the

intervals, then the chords and then chord progressions. He further states that this practice stems from the belief that real musical compositions are too complex for the students to handle, especially in the early stages of study. The downside here is that exercises in this system are either correct or incorrect, with little room for interpretation. This type of learning relies mostly on repetition.

David Salisbury (1990) points out that "recent research on cognitive learning suggests that the role of drill and practice in learning may be more important than has previously been realized". What has traditionally been identified as fundamental units of knowledge and skill can often be broken down into still smaller units. It is in learning these "subskills" that a drill approach seems to fit best. Merrill and Salisbury (1984) give this example: "Consider the musician learning a new piece of music. Once the mechanics of the piece have been mastered, the musician can then focus attention on interpretation. The implication of this research is that drill and practice can serve a very important role in bringing the learner to a level of "automaticity" on lower level subskills so that the learner can more readily perform some higher level complex skill.

Rogers (1984) says that many ear training classes focus too much using only the drill-and-repetition aspects of learning to hear. It is not enough just to recognize the sound(s) but we should hear this sound(s) in a musical context. "The weakness of this approach centers on a failure to distinguish between sound events (requiring just ears) and musical events (requiring ears and minds). A well-rounded ear-training program includes at least two discernable phases--one preliminary and the other more terminal--just as true analysis in written work is prepared by the antecedent stage of description. In the case of ear training, the preliminary phase does not necessarily have to be mastered before moving on to the next level. The two stages can, to a large extent, be overlapped and in certain situations learned simultaneously. The second stage, in fact, like analysis itself, also incorporates the first, but moves beyond fragments to real musical contexts." (Rogers, 1984)

According to Rogers (1984) the first stage of ear training is concerned with the accurate perception and labeling of individual events: the quality of an interval or chord for example. The other stage involves the understanding of musical relationships and for teaching purposes implies, almost demands, a 'holistic approach' as he calls it. "The distinction is between letting sound simply strike the ear drum and plugging that sound into conceptual frameworks." (Rogers, 1984).

Root motion theory

Root motion theories started in 1722 with the publication of Rameau's 'Trait? de l'harmonie'(Treatise on Harmony), one of the first significant publications on music harmony. It was the basis for further research by Schoenberg (1969), Sadai (1980) and Meeus (2000). These educators and theorists analyze the harmonies in a composition through the intervallic distance between successive chord roots.

A pure root-motion theory involves two principles. The first principle asserts that all diatonic harmonies participate equally in the same set of allowable root motions. It is just this principle that distinguishes root-motion theories-which focus on the intervallic distance between successive harmonies-from more conventional views, in which individual harmonies are the chief units of analysis. (Tymoczko, A grammar for elementary tonal harmony, 2000).

The second principle asserts that certain types of root motion are preferable to others. For example: in tonal phrases, descending-fifth root motion is common, while ascending-fifth root motion is relatively rare. The strongest forms of this principle absolutely forbid root motion by certain intervals, as Rameau did with descending seconds. Schoenberg further explains vertical harmonic formations as Rameau did but focuses on the relationships between chords and key structures. The main difference with Rameau is that he (Rameau) did not allow or consider a motion up or down by a second, in other words stepwise motion between chords. He (Rameau) considered the IV V motion as an variation of the ii V as does Meeus (2000).

Schoenberg classifies root progressions in three types. In his publication "Structural functions of harmony" Schoenberg writes: "The structural meaning of a harmony depends exclusively upon the degree of the scale. The appearance of the third, fifth or seventh in the bass serves only for greater variety in the "second melody". Structural functions are exerted by root progressions." (Schoenberg, 1954)

Methodology

A quasi-experimental research design was used namely a one group pretest posttest design.

My approach to the solution of the problem is to design harmonic ear training exercises that apply root motion theory and use drill technique.

The drill technique is an efficient teaching method for the development of aural skills but the drill method by itself does not sufficient as a teaching tool. Rogers (1984) says it is not enough just to recognize the sound(s) but we should hear this sound(s) in a musical context.

A well-rounded ear-training program demands a 'holistic approach' that learns how to hear a sound in its contextual relationship. (Rodgers, 1984)

This holistic approach is achieved through the adding of root motion theory into the exercises. Students are taught to hear the relationships between chord progressions which results in a more complete and broader hearing experience.

Root motion theory classifies the progressions in **three** types:
(contextual relationship)

Strong or ascending progressions	A fourth up (fifth down)	A third down
Weak or descending progressions[2]	A fourth down	A third up
Superstrong progressions	A second up	A second down

The adding of chord progression types allows for a more structural hearing, a horizontal way of hearing chord progressions. As Benward (1990) explains "the purpose of dictation is to produce a certain kind of musician who can hear sound as meaningful patterns."

The process of developing the research instruments.

1. Harmonic ear training exercises for music majors designed by the researcher using a root motion and drill approach.
   1.1. Developing and try out of the sample lessons
   1.2. Pilot study
   1.3. The lessons (harmonic ear training exercises)
2. Pre evaluation form for the experts
3. One pre test and post test evaluation set.
4. Two tests during the treatment period.

The results from the pretest and posttest

1. The mean of the posttest is higher than the pretests' mean.
   The average increase of the mean was 20.54%.
2. The increase was significant in all but one student.
   The student with the biggest improvement was at 45% and the lowest was 2.5%.
   (the student with the lowest improvement already had a high score at the pretest)
3. At the pretest 50% of the students had a grade of C and less. At the posttest none of the students had a grade of C and less and 14% had a score of C+ or B.

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[2] "Sometimes appear as 'mere interchange' or (I - V - I etc.) are better used in combination of three chords resulting in strong progressions" (Schoenberg, 1954)

Conclusions

I consider a 20.54% increase a significant improvement for two reasons:

- All students had previous ear training education to a certain degree. The students used during this project ranged from second to fourth year students.
- The treatment lasted a relative short time, eight lessons.

In my opinion the significant increase of accuracy in harmonic ear training was possible because of three main reasons:

- Students were encouraged to recognize not only chord progressions but also chord progression types as classified in a root motion theory.
- Students were consistently drilled using the same type of exercises.
- Limited material was used during this treatment (only elementary progressions)

This research also showed me that it is important not to overwhelm the students with material from the first lesson on. I learned that focusing on a few progressions (instead of all possible progressions at once) gives very good results on a short term basis. Gradually adding new material works well for harmonic ear training using a drill method.

Four students had a score of 80% or more on the pretest; the average increase of these students was still 11.9%. This shows that the incorporation of chord progression type exercises together with consisting drilling can further sharpen their hearing skills.

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