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# Music Learning Theories

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## Overview

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This paper examines the relationship between musical knowledge and teaching methods, particularly related to aural skill development. It discusses theories of musical knowledge and applies them in teaching strategies. Extensive bibliographic references are included in the appendices.

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## Music Cognition

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Over the last five decades, music educators have investigated the nature of musical knowledge and how it can dictate enlightened teaching methods. Important philosophers (Elliott, Reimer), cognitive psychologists (Gardner, Perkins), and music practitioners (Regelski) agree that music is an essential element of human nature, but draw different conclusions when they address the following questions:

- 1) What is musical knowledge?
- 2) Is music a product or a process?

## Knowledge

Knowledge is the lowest level of thinking, according to Benjamin Bloom's taxonomy. Students have knowledge when they can accurately state facts or identify an object. To conceptualize knowledge is more complicated. Educators decide whether to teach only facts, or to have students manipulate those facts with more sophisticated critical thinking skills such as analysis, synthesis, or evaluation. Initially, facts are necessary before any reasoning can be done. Perkins promotes teaching facts and the ability to use them at the same time. By contrast, E.D. Hirsch generated lists of factual knowledge he felt should be taught to every "culturally literate" individual.

Isolated facts alone become inactive knowledge when they are not applied to critical, reflective problem solving. Some music educators may be trapped in fact-based teaching, without considering how that knowledge will be used. Evaluating a student's ability to retain facts is temptingly neat and simple. A better teaching model moves beyond mere facts and engages students, who leave the classroom with the ability to analyze and solve problems on their own.

## Musical Knowledge

The way we conceptualize knowledge in the general sense informs our understanding of musical knowledge and how it comes into play during listening and performance. If musical knowledge goes beyond the ability to recite facts and extends into the ability to operate on musical information through performance, the charge to music educators is to teach students to think critically in addition to developing basic musical skills. It is possible to structure learning experiences in lessons and

rehearsals through which students identify problems, critically evaluate them, and work together to solve them. If ensemble players are expected to blindly follow the conductor, there is no room for decision-making or independent thought. The problem with skill-based music curricula is that students are expected to acquire large amounts of memorized information but are not challenged to use that information to solve or pose problems. Any curriculum that focuses on performance without the integration of history and theory, or without providing opportunities for the students to pose or to solve problems is limited in its effectiveness. It is a challenge to create a rehearsal environment where students apply knowledge to common problems and solve those problems with analytical and evaluative thinking and action, while preparing for the next concert.

### **A More Encompassing Philosophy**

David Elliott's praxial philosophy of music education offers a distinction between musical works and musical process in relation to the enlightenment and postmodernism. In Europe, from the middle of the eighteenth century until the rise of postmodernism, a piece of music was conceived as an entity like a visual artwork. Some educators still focus on the product rather than the process. According to Elliott, to look at or listen to music and focus exclusively on its structural or aesthetic qualities, in abstraction from its context of social use and production is contrary to what music making is all about. In the praxial philosophy, music making is central.

### **Musical Knowledge and Constructivist Theory**

Jerome Bruner proposes a view of constructivist learning theory in which the teacher is aware of the structures students bring to the learning experience and builds on those structures. Embedded in Bruner's theory are the pursuit of excellence and the student's emotional connection to the learning experience. In *Music Matters*, Elliott writes, "***we don't hear music as it is, we hear it as we are.***" This places the student at the center of any educational strategy.

It is a common misconception that the nature of music study involves merely learning skills related to performance or the rote memorization of facts about the music. The nature of musical knowledge is complex and includes critical and reflective cognitive processes such as thinking, knowing, and listening far beyond mere facts and skills. The thought processes in which students engage while making music and listening is the central concern in an effective music teaching philosophy and subsequent practice.

### **Further Sources of Information**

The Music Cognition Group of the Society for Music Theory conducts current research in this field. Some of the topics addressed in the study of music cognition are learning and development, culture and biology, music and language, perception of sound, consonance and dissonance, emotion and meaning, composition and improvisation, melodic organization, listening to music, performing music, melody, scales, harmony, tonality, dissonance, rhythm, and other musical elements. The Music Cognition Resource Center at the Ohio State University site at <https://www.musiccognition.osu.edu/> contains a large repository of information. An annotated bibliography of print resources on music cognition is included among the references at the end of this paper.

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## *Music Learning Theories*

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### **Constructivist Theories**

Constructivism is a catchword in educational circles which attempts to explain how people learn and the nature of knowledge. As music educators, we do need to think about our work in relation to theories of learning and knowledge. It is not a new concept; the core ideas having been clearly enunciated by John Dewey, among others. There is, however, a new acceptance of these ideas, along with new research in cognitive psychology to support it.

The central idea is that learners construct knowledge for themselves. Each learner individually constructs meaning as they learn. Constructing meaning is learning. There are two major ramifications of this perspective. The first is that we must focus on the learner in thinking about learning, not on the subject matter. The second is that there is no knowledge independent of the meaning attributed to experience, constructed by the learner.

If we accept constructivist theory (as did Dewey, Piaget, Vigotsky and others), we relinquish Platonic and all realistic views of epistemology. There is only the knowledge we construct for ourselves as we learn. Learning is not understanding the true nature of things, but rather a personal and social construction of meaning out of an array of sensations with no order or structure other than the explanations that we fabricate.

The basic premise here is that there is no such entity as a *Ding an sich*, whether or not we can perceive it. Realists still refute Bishop Berkeley, as did Samuel Johnson, by kicking the stone and feeling real pain. Does it make any difference whether we consider knowledge to be about external things, or whether we consider knowledge to be of our own making? As music educators, if our epistemological views dictate our pedagogic views, it makes a significant difference.

As realists, we organize musical information in the most rational way possible and present it to the learner. This view may still engage us in providing the learner with activities, with hands-on learning and ways to manipulate musical objects, however the intention remains to make clear the structure of music independent of the learner. We help the learners understand the music, without asking them to construct it for themselves. Constructivist theory requires that we stop trying to explain the structure of music, and let each student create his or her way of knowing it. If we accept the constructivist position, we must follow a pedagogy that provides learners with the opportunity to interact with sounds and construct their own relationships.

We struggle with the belief that learners will construct meaning that we find acceptable and feel the need to construct meaning for them. We often structure situations that do not allow learners to freely carry out their own mental actions, ones that guide them to our ideas about the meaning of experience. It is this tension between our desire as teachers to teach the truth (our personal version of reality), and our desire to let learners construct their own world which requires us to think seriously about epistemology and pedagogy.

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## Constructivist Learning

Here are some principles of constructivist thinking to keep in mind when we consider our role as educators,

- 1) Learning is a process in which the learner uses sensory input and constructs meaning out of it. It is not the passive acceptance of knowledge which exists externally but involves engaging with the world. (Dewey called this active learning).
- 2) People learn to learn as they learn: learning consists both of constructing meaning and constructing systems of meaning. Each meaning we construct makes us better able to give meaning to other sensations which can fit a similar pattern.
- 3) The crucial action of constructing meaning happens in the mind. Physical actions may be necessary for learning but are not sufficient; we need to provide activities which engage the mind as well as the body. (Dewey called this reflective activity).
- 4) Learning involves language: the language we use influences learning. Researchers have noted that people talk to themselves as they learn, and that language and learning are inextricably intertwined.
- 5) Learning is a social activity: our learning is intimately associated with our connection with other human beings, our teachers, our peers, and everyone else. Much of traditional education, as Dewey pointed out, is directed towards isolating the learner from all social interaction, and towards seeing education as a one-on-one relationship between the learner and the objective material to be learned. In contrast, progressive education (according to Dewey) recognizes the social aspect of learning and uses conversation, interaction with others, and the application of knowledge as an integral aspect of learning.
- 6) Learning is contextual: we do not learn isolated facts and theories in some abstract mind space separate from our lives: we learn in relationship to what we know and what we believe. On reflection, it becomes clear that this point is actually a corollary of the idea that learning is active and social. We cannot divorce our learning from our lives.
- 7) We need knowledge to learn: it is impossible to assimilate new knowledge without having some structure developed from previous knowledge to build on. The more we know, the more we can learn. Successful teaching is connected to the state of the learner, providing a path to new information based on each learner's previous knowledge.
- 8) It takes time to learn: learning is not instantaneous. For significant learning we need to revisit ideas, ponder them, try them out, play with them and use them.
- 9) Motivation is a key component in learning. It includes an understanding of ways in which the knowledge can be used, and therefore has value.

A key point for music educators is that physical involvement is highly desirable for learners in most situations, but it alone is not sufficient. All hands-on activities must also be minds-on. They should

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provide something to think about as well as something to do. These influential principles of constructivism can effectively be applied to music learning. The principles appeal to an enlightened view of learning and knowledge, but they may conflict with traditional pedagogical practices. We need to reflect on our methods in order to apply these ideas to our work.

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## *The Concept of Audiation*

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Edwin E. Gordon (1927-2015), an American music educator, developed a sequence for music instruction in the 1970s, culminating in the formulation of his music learning theory. He coined the term "audiation" to refer to the goal of music instruction: inner hearing (hearing music in the mind with understanding when no sound is present). His music learning theory is an explanation of how we learn when we learn music. Similar to the classic European pedagogies, Gordon supports the sound-before-symbol approach to music instruction. As in the development of language, learners listen to tonal and rhythm patterns, imitate them, and then read and write them. Audiation occurs when learners have had ample listening experiences, so that they can see a notated rhythm or melody and make musical sense of it, "hearing" it even if it is not sounded aloud.

Gordon's theory of music learning suggests a hierarchy of musical skill-building that begins with aural perception and discriminative listening, progresses through the development of music reading and writing, improvisation, and culminates in a theoretical understanding of music.

Audiation is not the same as aural perception, which occurs simultaneously with the reception of sound through the ears. It is a cognitive process by which the brain gives meaning to musical sounds. Audiation is the musical equivalent of thinking in language. When we listen to someone speak, we must retain in memory their vocal sounds long enough to recognize and give meaning to the words the sounds represent. Likewise, when listening to music we are at any given moment organizing in audiation sounds that were recently heard. We also predict, based on our familiarity with the tonal and rhythmic conventions of the music being heard, what will come next. Audiation, then, is a multistage process.

Although musicians audiate all aspects of musical sound, including timbre, volume, and style, music learning theory is concerned specifically with the tonal and rhythm dimensions of music. Teaching methods are designed to help students develop their ability to audiate tonal content and rhythm content.

Through development of audiation students learn to understand music. Understanding is the foundation of music appreciation, the ultimate goal of music teaching.

### **Types and Stages of Audiation**

The types of audiation are not hierarchical. Some of the types, however, serve as readiness for others.

Type 1 - Listening to familiar or unfamiliar music

Type 2 - Reading familiar or unfamiliar music

Type 3- Writing familiar or unfamiliar music from dictation

Type 4 - Recalling and performing familiar music from memory

Type 5 - Recalling and writing familiar music from memory

Type 6 - Creating and improvising unfamiliar music

Type 7 - Creating and improvising unfamiliar music while reading

Type 8 - Creating and improvising unfamiliar music while writing

As theorized, the six stages of audiation are hierarchical--one stage serves as a readiness for the next. The table below outlines the stages of audiation as they occur in Type 1 of audiation (listening to familiar and unfamiliar tonal patterns and rhythm patterns in familiar and unfamiliar music).

Stage 1 - Momentary retention

Stage 2- Initiating and audiating tonal patterns and rhythm patterns, recognizing tonal/rhythmic features

Stage 3 - Establishing objective or subjective tonality and meter

Stage 4- Consciously retaining in audiation tonal patterns and rhythm patterns that we have organized

Stage 5 - Consciously recalling patterns organized and audiated in other pieces of music

Stage 6- Conscious prediction of patterns

Gordon's music learning theory is outlined below, paraphrasing his own language.

### **Tonal Elements**

Tonal learning is facilitated by development of a sense of tonality and a vocabulary of tonal patterns. The tonal patterns used in learning sequence activities are organized according to tonality classification (major, minor, dorian, and so on) and tonal pattern function (tonic, dominant, subdominant, and so on). Of the many tonal solfege systems available, the one best suited for developing audiation is the "*moveable do*" system.

### **Rhythmic Elements**

Rhythm has three elements. They are macrobeats, microbeats, and melodic rhythm. All three of those elements must be audiated at the same time in order to establish rhythm syntax.

### **Skill Learning Sequence**

There are two main categories of levels of skill learning sequence: discrimination learning and inference learning. Discrimination learning is rote learning. It takes place when students are conscious of, though they may not fully understand, what they are being taught. For example, they may be taught that two familiar tonal patterns are the same or different. A student is conscious of what they are learning because they are being taught by someone else. Inference learning is conceptual learning. It takes place when a student is unconscious of what they are learning because they are teaching themselves.

Discrimination learning is of initial primary concern to a teacher because students cannot learn to make inferences unless they have learned how to make and have made discriminations.

## Discrimination Learning

In order for students to understand music, they must build a vocabulary of tonal and rhythm patterns, comparable to a vocabulary of words in language. Most discrimination learning consists of students echoing tonal or rhythm patterns sung or chanted by the teacher. The format is call and response, and students may perform as a group or in solo.

**Aural/Oral.** Aural/oral is the most basic level of skill learning sequence, the foundation upon which all higher-level skills are built. Listening is the aural part, while performing, usually singing, is the oral part. Optimum musical development occurs when the two are combined in a continuous loop so that they interact with and reinforce each other.

**Verbal Association.** At this level, students associate vocabulary names and proper names with the patterns, functions, tonalities, and meters they learned at the aural/oral level. The tonal and rhythm patterns taught at the aural/oral level are learned with appropriate tonal solfege syllables or rhythm solfege syllables. Verbal association facilitates discrimination between patterns.

**Partial Synthesis.** At the aural/oral and verbal association levels, students learn tonal and rhythm patterns individually. The teacher performs a series of familiar tonal or rhythm patterns without solfege and without first establishing tonality, and students are able to identify the tonality or meter of the series. The purpose is to assist them in recognizing for themselves familiar tonalities and meters. As a result of acquiring partial synthesis skill, a student is able to listen to music in a sophisticated, musically intelligent manner.

**Symbolic Association.** At this level, students learn to read and write music notation by associating the sound and solfege of the patterns they learned at the aural/oral and verbal association levels with the notation for those patterns. The process is one of recognition, not decoding. As the teacher points to a pattern, the students are simply told "What you are audiating looks like that." Students are not taught the letter names and time values of individual notes, nor the definitions of key signature and other symbols. These are taught at the theoretical understanding level of inference learning.

**Composite Synthesis.** At the partial synthesis level, students are able to give syntax to a series of familiar tonal or rhythm patterns. At composite synthesis, students read and write a series of tonal and rhythm patterns with the ability to identify the tonality or meter of the series.

## Inference Learning

Students are not taught by rote at this level; they make their own discoveries. As a result of their experience with familiar patterns at various levels of discrimination learning, students are able to identify, create with, and improvise unfamiliar patterns in inference learning. Whereas in discrimination learning a teacher teaches a student both *what* to learn and *how* to learn it, in inference learning a teacher teaches a student only *how* to learn. The student teaches themselves *what* they learn.

**Generalization.** Generalization has three sublevels: aural/oral, verbal, and symbolic. The sublevels are analogous to the corresponding levels of discrimination learning, except, that the student is able to audiate unfamiliar patterns by comparing them to the familiar patterns they learned by rote.



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**Creativity/Improvisation.** In order to create or improvise, the student must have something to create or improvise *with*. The tonal and rhythm patterns learned in discrimination learning comprise the content the student uses to form their own unique musical ideas in creativity and improvisation. Creativity is easier than improvisation because there are more restrictions on a performer when they improvise than when they create.

**Theoretical Understanding.** Music theory explains why music is audiated, performed, read, written, created, and improvised as it is. It is to music what grammar and linguistics are to language. Taught in proper sequence, theoretical understanding can strengthen what was learned at the lower levels of music learning. In language learning, grammar and the parts of speech are not taught until learners have developed considerable skill in thinking, speaking, improvising (conversing), reading, and writing in their native tongue. The same should be true in music teaching.

Unfortunately, music theory is often taught to students who do not audiate. Such a sequence can only hinder development. For most efficient learning, ideally students should not be introduced to theoretical understanding until they have achieved all previous levels of discrimination and inference learning to the extent that their music aptitudes will allow.

At the theoretical understanding level, students learn information commonly taught in traditional methods as a readiness for music reading, such as the names of lines and spaces, time value names, sharps and flats, time signatures, and key signature definitions. They also learn intervals, chord spellings, and other information traditionally taught as music theory.

The official web site for Music Learning Theory and the Gordon Institute for Music Learning (GIML) is at <http://www.giml.org>.

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## *References and Resources*

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## **Music Cognition (Print Resources)**

Deutsch, D. (editor). *The Psychology of Music*. Second edition. San Diego: Academic Press, 1999; 791 pages of main text. ISBN 0-12-213564-4 (hardback) ISBN 0-12-213565-2 (paperback)

Dowling, W.J. and Harwood, D.L. *Music Cognition*. San Diego: Academic Press, 1986; 239 pages of main text. ISBN 0-12-221430-7 (hardback only)

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Snyder, B. Music and Memory: An Introduction. Cambridge, Massachusetts: MIT Press, 2000; 243 pages of main text plus glossary of terms. ISBN 0-262-19441-4 (hardback). ISBN 0-262-69237-6 (paperback).

### **Music Cognition (Online Journals)**

Music Perception (<https://online.ucpress.edu/mp>)

Psychology of Music (<https://journals.sagepub.com/home/pom>)

Musicae Scientiae (<https://journals.sagepub.com/home/msx>)

Psychomusicology (<https://journals.scholarsportal.info/browse/02753987/unassigned>)

Empirical Musicology Review (<https://emusicology.org/>)

Journal of Music Perception and Cognition (<https://www.istage.ist.go.jp/browse/jsmpc/-char/en>)

European Society for the Cognitive Sciences of Music (<https://www.escom.org/society-en.html>)

Contemporary Music Review (<https://www.tandfonline.com/toc/gcmr20/current>)

Journal of Research in Music Education (<https://journals.sagepub.com/home/jrm>)