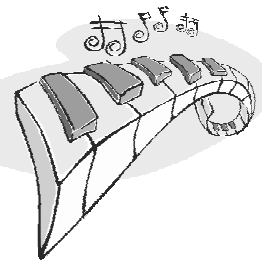




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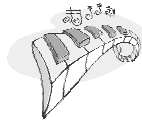
AUDEA

Volume 15 ▪ Number 2 ▪ Fall 2010

The GIML Audea

Sponsored by the Gordon Institute for Music Learning

Information written for and by teachers, parents, and administrators who promote the practice of music education through music learning theory.



AUDEA

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The Gordon Institute for Music Learning (GIML) is a nonprofit organization dedicated to advancing the research in music education pioneered by Edwin E. Gordon. The broad purpose of this Institute is to ensure that Dr. Gordon's work realizes its potential to serve as the foundation for future research and to revitalize music education for generations to come. The Institute supports research into how individuals learn music through research in teaching teachers, in teaching parents and in teaching students of all ages.

Audea, the official publication of GIML, is issued to GIML members two times each year. Publication information and inquiries should be addressed to:

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Guidelines for Article Submission

1. Manuscripts for possible publication should be double-spaced, 2-10 pages in length, in Times New Roman, font size 12. Use tabs before each paragraph only and no other formatting procedure.
2. Each manuscript should be submitted electronically to the publications chair in a folder that includes the author's bio (approx. 100 words) and publicity photo. Included in the bio should be information regarding where and what they teach. Also included in the folder should be all illustrations to be included with the article such as musical examples, diagrams, and charts, (all as *tiff* files), each sent as individual documents.
3. Placement of illustrations should be noted through use of labels within the text of the article.
4. Quoted music and materials must be cleared in writing with copyright holders prior to submission. Copies of letters and contracts granting permission to print copyrighted material must accompany the submitted article or be sent by hard copy to the publications chair.
5. Bibliography should be formatted according to style recommendations found in the latest edition of the *Publication Manual of the American Psychological Association*. Direct references within the text should include name of author, date of publication, and page number, and be placed as endnotes after the Bibliography.
6. Photographs will be printed if space permits.
7. The editor reserves the right to edit all copy submitted to the *GIML Audea*. Manuscripts requiring revision may be returned to the author for revision.

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FROM THE EDITOR



Dear Readers --

We at *Audea* are excited to bring you the latest edition, and with it, two important articles.

Maria Runfola and Beth Etopio, in their paper *Initial Development of a Measure to Capture Young Children's Emergent Audiation*, describe the process involved with their development and evaluation of a comprehensive performance-based criterion measure, termed the *Test of Early Audiation Achievement*, for use in early

childhood music education research, and pose some thought-provoking questions for further research.

Lauren Kooistra's *The Development of Musical Thinking: What Learning Theories Can Tell Us* provides an insightful and informative overview of the learning theories and models provided by the great thinkers in education such as Jean Piaget, Lev Vygotsky, Albert Bandura, Noam Chomsky, and Robert Gagné, and then outlines how these learning theories are reflected in ten principles of music learning as observed in Gordon's Music Learning Theory. I trust you will find her presentation and synthesis of these important ideas as educational as I did.

Best wishes to all in 2011.

Sheryl Iott, DMA, SCTM

FROM THE PRESIDENT

Dear Readers --

As I begin my presidency I want to thank past-president Jennifer Bailey for dedicating several years to GIML and her initiative for the development of the website. I would like to carry on Jennifer's vision to continually improve the website and on-line communication.

I am excited to serve as president of GIML and my goal is to keep everyone focused on the mission of GIML and continue to reach out to individuals who are interested in joining or those who have never heard of Music Learning Theory. Retention of current members and recruiting new members needs to be the goal of GIML during these tough economic times.

As members of GIML we need to encourage potential new members to attend one of the many Certification Courses taught throughout the country, which can be found on our website. Another way to recruit new members to GIML is by extending an invitation to colleagues to attend the 3rd

International Conference on Music Learning Theory in Chicago August 2 – 4, 2011. Heather Kirby is the conference chair and has organized a superb committee to assist her in making this a wonderful conference titled *Audiation for a Lifetime of Music*.

Also I would like to encourage a stronger relationship with our sister organizations (American Orff Schulwerk Association, The Organization of American Kodály Educators, and Dalcroze Society of America). We need to take an active role in working with these organizations. We should also encourage their membership to take a GIML Certification Course and show them how Music Learning Theory can be combined with their current discipline.

Through this effort for recruitment and retention of all members, I believe that GIML will continue to grow in strength and stature. Let's all plan on meeting in Chicago this August.

Best wishes to all for 2011.

Diane Lange, Ph.D.



Maria Runfola



Elisabeth Etopio

Initial Development of a Measure to Capture Young Children's Emergent Audiation

by Maria Runfola and Elisabeth Etopio

As practitioners guiding young children's music learning, we rely on the naturalistic method of observation, documenting their progress through the types and stages of preparatory audiation. Beginning with Hicks (1993) and continuing through more recent work (Hornbach, 2005; Reynolds, 2006; Sullivan, 2006; Valerio, Seaman, and Yap, 2006), early childhood music researchers have provided considerable information about what children in preparatory audiation are able to do musically, and have captured ways teachers elicit musical responses of young children with success. While these rich descriptions provide insight into characteristics of young music learners, such qualitative techniques do not yield data that can be used in statistical models that confirm the trajectory of how young children emerge from preparatory audiation. This becomes particularly important when one sets out to obtain federal funds from agencies requiring design features that include rigorous scientific method with sophisticated quantitative analytical techniques.

Criterion measures play an important role in quantitative method. Numerous aspects of developmental appropriateness warrant consideration when constructing such measures for young children. The Goals 1 Early Childhood Assessments resource group, charged by Title II to develop principles and recommendations for early childhood assessment (Shepard, Kagan, and Wurtz, 1998) recommends that when researchers develop criterion measures, they should take into account rapid growth rates typical of young children, variations in language proficiency that might have impact on test results, and the need to give students opportunity to participate in tasks that are

familiar. For example, many children in preschool are not comfortable with pencil/paper tasks, thus performance events and tasks are more appropriate at this stage of development.

All that aside, there is a real philosophical tension in our profession regarding testing of young children. The main causes of this tension arise from such beliefs as that testing "spoils the magic"; that, considering the precious few instructional minutes we are allowed in the schools, we shouldn't waste any of those minutes on testing; that little ones should not be put in formal testing situations; and more. Yet, if Gordon had not tested many children, would we have support for the sequences that make up his Music Learning Theory? Though in recent years much of his research has been more qualitative in nature, his tests and the taxonomy of tonal patterns and rhythm patterns were dependent upon putting children into a formal testing situation. Once it has been verified that tests measure what they purport to measure, those tests can be used for research or informally for formative assessment during instruction.

The domains of children's music learning are considerable and have been defined differently by various researchers (Runfola and Swanwick, 2002). But, when we are focused on how children learn when they learn music, the tasks most typical of informal music guidance are singing, chanting and moving. Thus, in order to determine a level of tonal and rhythm achievement of children in preparatory audiation, the most appropriate type measure is a performance event, including the rubrics or rating scales necessary to derive scores. Research regarding such rubrics or ratings scales is limited.

A number of dissertations and theses contain rubrics and other forms of rating scales for assessing children's singing, including tonal and rhythm characteristics (Boardman, 1964; Cernohorsky, 1991; DeCarbo, 1981; De Yarman, 1971; Dittmore, 1968; Feierabend, 1984; Guilbault, 2002; Hale (Runfola), 1977; Jambeau, 2006; Jarjisian, 1981; Lange, 1999; Levinowitz, 1987; Ramsey, 1981; Wolf, 2003; Wyatt, 1993). Many were used solely for the dissertation and were not investigated further. Measures such as the *Singing Voice Development Measure* (SVDM) (Rutkowski, 1986) and the *Rhythmic Competence Analysis Test* (RCAT) (Weikart, 1989) have undergone ongoing investigation by the authors and others, but the purpose of these measures was not consistent with Gordon's theory of preparatory audiation where there is emphasis on guiding students based on their musical age. Musical age is developmental age specific to music and delineates the trajectory of learning as a child progresses through the types and stages of preparatory audiation over time and under different conditions. The on-demand performance events found in Blesedell (1991) and Taggart (1994) approached our needs but did not encompass all the domains we wanted to include in our measure. Thus, since research results are no better than the quality of the criterion measure (Colwell, 1990; Gordon, 1986), we set out to develop a measure that paralleled the content of the curriculum that was being used in our project. Accordingly, the purpose of this paper is to describe the initial development of a comprehensive performance-based criterion measure for use in early childhood music education research.

Development of the Measure

The *Test of Early Audiation Achievement* (T-EAA) was developed to measure young students' early tonal audiation and rhythm audiation achievement. The on-demand performance event is introduced to preschool children in a class setting and then administered to individual children.

T-EAA has been used successfully with preschool children ranging in age from three-years to five-years. The test consists of four subtests measuring students' performance of the tonal center (resting tone), tonal patterns, rhythm patterns and a familiar song. In some ways, the on-demand performance event mirrors the process of acquiring the language of music beginning with "whole" -- where students listened to an entire song and responded with the tonal center, proceeding to "part" -- with the tonal pattern and rhythm pattern items, and culminating with a familiar song, where children combine "parts" into a "whole."

In developing T-EAA both qualitative and quantitative methods were used. Classical test theory and more contemporary thought regarding assessment formed the foundation of methodology. The validity of T-EAA is grounded in Gordon's theory of preparatory audiation and Gordon's taxonomy of tonal and rhythm patterns.

Procedures for administration were developed and refined with a small sample of children (N=6) to insure a four-year-old could understand and perform the music behaviors required in each subtest. Next, rubrics, a form of rating scale, were developed using Gordon's recommendations (2002) as well as the intensive procedures set forth by Wiggins (1998), gold standards for development of such assessment instruments.

T-EAA initially was administered to a sample of 163 preschool students. A team of early childhood music specialists reviewed a select sample of these 163 performances and recorded qualitative observations of the various performance characteristics they observed. These observations were then organized hierarchically into an analytic rubric for each subtest, and subsequently, the rubrics were revised to reflect knowledge gleaned from the literature. Next, two independent music specialists used the T-EAA scoring rubrics to adjudicate all 163

student performances. Four sets of CDs were prepared from the children's T-EAA performances; to eliminate potential rater bias resulting from hearing previous item performances, children's performances were divided by subtests and arranged in different random order on the CDs. Preparing the CDs so that adjudication could take place by subtest, with the 163 performances in different random order for each subtest, was similar in procedure to the way exams with multiple essay questions are scored.

The raters provided feedback regarding the rubric criteria (4=high, 1=low). Although the reliability estimates were acceptable, the scoring rubrics were revised again, this time based upon the rater's comments and observations. Finally, the revised rubrics (Figure 1) were used with another sample of 134 children to determine the effectiveness of the revisions.

	4	3	2	1
Tonal Center Rubric	Resting tone sung with a sense of tonal center	Resting tone sung out of tune, OR Dominant sung in lieu of resting tone, OR Student slid into resting tone	Sung response other than tonic or dominant	Spoken response (not sung)
Tonal Pattern Rubric	Pattern is correct and in tune or with minor intonation errors OR Response improvisatory and in tune.	Accurate melodic direction; at least one accurate pitch; others approximate OR Only beginning pitch is sung and correct OR Improvisatory response out of tune;	No pitch accuracy; some melodic direction; no suggestion of improvisation	Pattern not recognizable; no directional relationship
Rhythm Pattern Rubric	Pattern performed accurately with consistent tempo and accurate meter throughout OR Response improvisatory with consistent tempo and accurate meter	Pattern correct but inconsistent tempo OR Response improvisatory but inaccurate meter or inconsistent tempo	Repeats pattern #1; does not differentiate	Inaccurate; no suggestion of improvisation
Song Tonal Rubric	Patterns accurate or with slight intonation imprecision; tonal context maintained	Patterns recognizable; similar melodic direction; tonal context may or may not be maintained	Patterns minimally recognizable; some melodic direction; tonal context not maintained	Patterns generally unrecognizable; no apparent melodic direction or tonal context
Song Rhythm Rubric	Patterns accurate, with confidence and a sense of style; rhythm context maintained	Most patterns accurate; sense of meter maintained; slight tempo variations	Most patterns recognizable; some content inaccuracies and/or moderate tempo variations	Patterns generally unrecognizable; lack objective rhythm context

Figure 1. T-EAA scoring rubrics. This figure includes descriptors for assessing subtests of T-EAA (4= high, 1 = low).

Quality of the Measure

Typically, there are four characteristics of a good test or measure. While practicality and interpretability are important considerations, validity is, of course, our most important concern. We touched briefly on practicality when we decided to use a performance event because it is better for this age than a paper/pencil test but it is a lengthy and labor intensive process to administer to children individually, including prepping them for familiar context and scoring their taped performances. Interpretation includes acknowledging that any such measure is merely a snapshot in time and that the rapid development of preschoolers might make that snapshot obsolete before it is scored. Nonetheless, that snapshot provides evidence of children's music development from a particular perspective. Admittedly, it may be a narrow perspective, but one that might be an important contribution to the whole picture.

Because reliability is a necessary though not a sufficient condition for valid interpretations of a measure (Gordon, 1977; Popham, 2000), we estimated several relevant reliabilities (Table 1). Here we define inter-rater reliability as the magnitude of correlation between the scores of two independent judges and intra-rater reliability as the correlation between two independent ratings of the same performances by the same judges. As can be seen in Table 1, these reliability estimates ranged from moderate ($r = .63$) to high ($r = .99$) and thus were deemed of satisfactory magnitude to use them for obtaining preliminary objective evidence of the validity of T-EAA. (See Table 1)

Having established that T-EAA functioned in a stable manner, aspects of validity were then addressed. Some evidence is subjective while other is more objective.

Subjective evidence included content validity, established by constructing the test items consistent with the first two types of preparatory audiation defined by Gordon (2003) and his hierarchy of tonal pattern and rhythm pattern difficulty levels (Gordon, 1974). It should be noted that the curriculum utilized by the teachers of the students who participated in these initial samples was grounded in preparatory audiation. Thus, the items and rubrics paralleled the context and content of the teacher's lesson plans (Gordon, 2002). Construct validity was not reviewed because it is more appropriate to an aptitude test rather than an achievement test (Gordon, 2007).

Objective evidence, though indirect, was obtained by correlating T-EAA scores with SVDM (Rutkowski, 1990) and *Audie* (Gordon, 1989). Gordon (1979) refers to this as inverse validity, a type of concurrent validity. (See Table 2)

Table 1
Reliabilities for the Subtests of T-EAA

Subtest	Runfola & Etopio (2006) ^a	Inter-rater reliability		Intra-rater reliability	
		Etopio (2009) ^b	McDonel (2009) ^c	Etopio (2009)	
				Rater 1	Rater 2
Tonal Center	.88	.88	--	.90	.85
Tonal Patterns	.91	.92	--	.96	.99
Rhythm Patterns	.91	.93	--	.97	.93
Song			<u>Familiar</u>	<u>Original</u>	
Tonal Elements	.73	.85	.92	.87	.89
Rhythm Elements	.63	.80	.87	.82	.91

^a N = 164 ^b N = 134 ^c N = 26

Table 2
Correlations Between SVDM, Audie, and the Subtests of T-EAA

	SVDM	Subtests of <i>Audie</i>		Subtests of T-EAA				
		Melody	Rhythm	Tonal Center	Tonal Patterns	Rhythm Patterns	Song-Tonal	Song - Rhythm
SVDM	1.00							
<i>Audie-M</i>	.18	1.00						
<i>Audie-R</i>	.15	.53	1.00					
T-EAA Tonal Center	.31	-.04	-.002	1.00				
T-EAA Tonal Patterns	.69	.16	.12	.30	1.00			
T-EAA Rhythm Patterns	.19	.13	.19	.21	.30	1.00		
T-EAA Song - Tonal	.58	.27	.31	.16	.56	.26	1.00	
T-EAA Song - Rhythm	.27	.18	.24	.002	.23	.32	.56	1.00

In theory, the ceiling of validity is estimated by the square root of the product of the reliabilities of the tests represented by the correlation coefficient (Gordon, 2007). The validity correlations cannot be higher, and are usually much lower, than this theoretical ceiling. Hence, the highest correlations we would expect between SVDM and the T-EAA subtests (tonal center, familiar song tonal elements, and tonal patterns) would be .89, .81, and .90, respectively. As can be seen in Table 2, the correlations of SVDM with the Tonal Subtests of T-EAA ranged from .31 to .69, considerably lower than the theoretical ceilings. Although SVDM and the tonal subtests of T-EAA shared 9.6% - 48% variance, there is indirect evidence that the majority of variance between these tests is related to unique factors rather than *use of singing voice* as measured by SVDM. It is interesting to note, however, that the smallest correlation was between SVDM and resting tone ($r = .31$). The moderate correlations between SVDM and the tonal patterns as well as SVDM and the tonal elements of the song may be due to the similar nature of the tasks required in both measures.

To continue gathering objective evidence of the inverse validity of T-EAA, correlations between the subtests of *Audie* and T-EAA were examined. As can be seen in Table 2, the correlations between the tonal subtests of T-EAA and *Audie M* ranged from .00 to .27 and between the rhythm subtests and *Audie R* were .19-.24. These correlations are desirably low, suggesting the two tests have little variance in common and therefore are not measuring similar traits. Thus, these data offer indirect evidence that unique factors constitute a substantial portion of the variance between these two measures and that T-EAA may be emphasizing and measuring music achievement. However, Gordon (1979, p. 86) posited that "Because developmental music aptitude by definition is in a constant state of variation ... it is extremely difficult to distinguish between informal and formal music achievement on one hand and innate music aptitude on the other, and to understand how they interact." Nonetheless, at this point, we have a good degree of confidence that T-EAA was indeed measuring early audiation achievement and not measuring developmental music aptitude. To gain additional objective evidence to verify of the purpose of T-EAA, further analysis is needed and will be completed, but after we gather new data using the revised rubrics.

Recommendations

Though T-EAA has performed satisfactorily in several studies thus far (Bugos, 2010; Etopio, 2009; Lee, 2010; McDonel, 2009; Runfola and Etopio, 2006), in the course of those studies, several issues

arose that need to be addressed. One of the most crucial was the improvisatory-like responses of children because the rubrics did not account for responses which demonstrated correct context (tonality and meter) and function (tonic, dominant, macro beats and micro beats), but were different than the given pattern. Thus the rubrics were revised once again, this time using the proper vocabulary names Gordon uses for *Verbal Association* and in his *Taxonomies*. Further, we need to expand the content to include a movement component, minor tonality, triple meter, and unusual meter. The continued use of the song subtest is questionable due to the complexity of the task. As these items are addressed, we will undertake studies with national/international samples.

The 2009 revision of the T-EAA rubrics have not undergone field-testing as yet. If you are interested in using either the rubrics published in this paper or the 2009 rubrics, contact runfola@buffalo.edu or etopio@buffalo.edu for a copy of the procedures manual and the revised rubrics. Also, contact us if you are interested in participating in one of the several studies we have under design.



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Lauren Kooistra

The Development of Musical Thinking: What Learning Theories Can Tell Us

by Lauren Kooistra

Jean Piaget (1896-1980)

Piaget was interested in the development of learning as a changing relationship between a child and his or her environment, based on the child's maturity level and experience. As a child matures, according to Piaget, cognitive structures change, which allows for new elements to be added to the child's resources. Piaget called these elements *schema*—internal mental representations, which enable a child to make sense of his or her environment.

Two processes occur when children engage their available schema with their environment: *assimilation* and *accommodation*. Assimilation allows a child to incorporate experiences into existing schema. This means that the child's prior knowledge is matched to what is happening in the environment, in a way that the child understands. If the child encounters new information in the environment, the process of accommodation causes internal representations to change in order to accept the information.

Schema change over time through a process of *equilibration*. Equilibration makes right any cognitive unbalance that may occur in the relationship of the child's internal mental representations with the external events encountered in the daily environment. Much as a muscle is torn and rebuilt during exercise, cognitive structures are thrown off balance and re-organized during the process of developmental growth.

For Piaget, changing cognitive structures occur in stages of development. Progression from one stage to the next occurs in a definite order, and tends to appear around the same chronological age in most children (with some variation). In the early stages, interactions with the environment occur through outward reflex motor actions without the use of thinking. Gradually, as more cognitive structures become available, children rely less on external interactions and more on internal representations in what Piaget called *interiorization*. As a child progresses through the stages of development, these interiorized representations become more and more complex, and can be defined by the term "thinking".

Lev Vygotsky (1896-1934)

According to Vygotsky, cognitive changes occur through interactions between social, cultural, and individual elements. Learning transpires as a co-construction of knowledge, with interactions being necessary components. Children bring their individual traits and experiences into social situations, and alter their understandings of reality and their cognitive structures based on their encounters with others in a situated cultural context. Within this individual-social-cultural triangle, language is seen as a powerful tool for causing cognitive change.

Children's manipulation of language undergoes a transformation of external to internal usage. First, children engage in social and external speech. Eventually their speech is privatized, but remains external. Ultimately, as meaning is attached to the sounds, speech is privatized and internalized. Once speech is internalized, it enables self-regulated thought.

A crucial element of Vygotsky's theory is the *Zone of Proximal Development* (ZPD). In the ZPD, a learner works on a task that is slightly more difficult than he or she is capable of completing, along with a peer or teacher holding more knowledge. The knowledge that the learner brings to the situation interacts with the experiences had there with the more knowledgeable "other," enabling the learner to construct meanings and expand cognitive structures. With the help of the "other" in this situation, the learner is able to do more complex tasks than he or she is capable of independently, and is therefore changed.

Albert Bandura (b. 1925)

Bandura considered learning to occur through observation of a model, which he defined as anything that provides a learner with information. The information a learner observes is internalized and used to direct behavior. Observational learning is an interaction between personal, behavioral, and environmental influences, and involves four processes: *attention*, *retention*, *production*, and *motivation*.

In order to appropriately organize instruction, it is important for music teachers to understand how students learn music. Music Learning Theory offers a systematic description of the learning processes students engage in while coming to think musically. Much as children develop and learn in other areas, the development of musical thinking requires an interaction of environmental, cognitive, social and individual factors as students gather the tools they need to be masters of their personal musicianship.

If "audiation is to music as thought is to language" (Gordon, 2003, p. 25), then mastery of musicianship involves the ability to internalize and manipulate sound, to correct mistakes, and to comprehend information within a context. While we cannot truly compare music learning and development to more general learning, we can perhaps glean some insight into the processes necessary for development of musical thinking and achievement by examining the learning theories found in traditional Educational Psychology.

Though many such theories exist, the theories of Piaget, Vygotsky, Bandura, Chomsky, and Gagné lend themselves to comparisons with Gordon's Music Learning Theory, and are briefly overviewed here. Ten principles of music learning follow, supported by elements of the work of Piaget, Vygotsky, Bandura, Chomsky, Gagné, and Gordon. What can these theories together tell us about the development of musical thinking?



Attentional processes are at work when learners are attending to some aspect of the modeled behavior. Through rehearsal, learners retain the information in symbolic form—either imaginal (through imagery) or verbal (conceptual). During production processes, the learner turns those imaginal and verbal representations into behavior. Organizing behavior to match the model through a coordination of visual and sensorimotor processes, the learner discards behavior or understanding that doesn't match the model using a *feedback loop*. Finally, observing reinforcement of certain behavior provides motivation and incentive for learners to turn the modeled behaviors into their own behavior.

When several models reflect a consistent application of a rule during a variety of tasks, a learner may manipulate the observed information through imitation and performance. Over time, the learner's behaviors are chained together and become increasingly more complex. Once able to model the rule, it can be said that the learner has learned the information and is not merely engaged in imitation.

Noam Chomsky (b. 1928)

Chomsky suggested human beings have an innate biological predisposition for transforming syntactical characteristics (or surface structures) of grammar into deep structures of meaning, in what he called the process of *generative grammar*. Learners can successfully internalize structures of language without being able to specify why or how the structure works, which suggests that there are mental processes at work beyond awareness. Implicit syntactical rules govern the generation of units of language. The elements that comprise the language can be broken down to syntactical, phonological, and semantic organizations, with syntax governing the organization of phonemes into meaningful patterns.

Chomsky argued that when acquiring language, children do more than simply repeat words that they hear. Children create their own variations and combinations of words which become refined over time. He suggested that a *language-acquisition device* enables learners to transform structures according to an innate system of rules, which enables them to comprehend meaning despite incorrect utterances. Hence, understanding and usage of the intrinsic rules of grammar develop naturally as the child is continually immersed in a specific language culture.

Robert Gagné (1916-2002)

Gagné claimed that a learner journeys through a series of prerequisites in order to achieve increasingly complex skills. The targeted complex skill sits at the top of a hierarchy. Instruction should be determined by asking the question "What skills are necessary to reach the targeted skill?" The hierarchy is then formed by breaking the task down into a series of necessary prerequisites that follow one after the other.

According to this model, skill is attained by movement through levels. A learner begins at the basic level with *associations and chains* and ends with *higher order rules*. In between are levels of *discriminations, concepts, and rules*. Each of these skill levels is met by instruction designed according to nine phases of learning in three categories: *preparation, acquisition and performance, and transfer*.

Gagné also emphasized the capacity of humans to label patterns or objects with verbal representations, which he called *verbal associations*. Associations occur in verbal units—chains of words that have a predictive nature, suggesting what may come next. Further, instruction that exposes the differences between patterns or objects based on their inherent characteristics enable learners to distinguish—or discriminate—between them.

Once learners are able to discriminate, they are ready for the next step—transferring understanding from familiar to unfamiliar situations and objects in what Gagné termed *concept learning*. In order to master concept learning learners need to recognize an object in an unfamiliar situation, and then classify similar but new examples of the object. When learners are able to define the overall class of the object based on its attributes, it can be said that they are fully defining the concept.

Ten Principles of Music Learning

1. Learners construct musical knowledge as a result of interactions between social, cultural, and individual traits and experiences.

For Piaget, Vygotsky, and Bandura, individual learning cannot be separated from an environment. Piaget considered the individual child's changing relationship with the environment to be essential to the learning process, while Vygotsky and Bandura spoke more specifically about the socio-cultural influences on the learner. Gordon recognized that learners bring innate musical aptitude into a musical environment, but suggested that environmental factors affect ultimate

musical achievement. Informal instruction in a rich musical environment during a child's early years is thus crucial to musical development.

2. Learners construct musical knowledge when mediated by teachers and peers

Vygotsky's ZPD is the zone between what the learner already knows and what he or she can potentially know. The distance here is mediated by the proximity of a more experienced peer or teacher. The observational learning processes of Bandura are based on the presence of a model as necessary for learning to progress. Though the model may be a passive presence, the existence of the model is in and of itself a mediating force. For Gordon, since all children are musical and bring varying levels of aptitude and achievement to a musical environment, the sounds in the environment and interactions with teachers and peers guide musical development.

3. Learners construct musical knowledge as they resolve conflicts between internal understandings and external events

Piaget's Equilibration procedures involve aligning internal and external events through assimilation and accommodation. Vygotsky pointed to cognitive changes through interactions between social, cultural, and individual factors. Bandura posited that learners organize their behavior to match external models, discarding what doesn't match during an internal feedback loop. Gordon posed that during the imitation and assimilation types of preparatory audiation, the learner engages in a process of coming to realize that responses do not match external events, and organizes responses due to conscious thought.

4. Learners construct musical knowledge by engaging in external and internal speech

Piaget's interiorization and Vygotsky's cycle of social and private speech suggest that learning occurs through an external to internal process, which involves the actual manipulation of speech. Bandura held that outward performance is not necessary for learning, but that it does occur in the retention and production aspects of learning as behavior is organized. Gordon suggested a similar process in the types and stages of preparatory audiation; during acculturation and imitation, learners respond externally to stimuli in the musical environment through music babble, and move to self-regulated musical thought in assimilation. Further, the aural/oral loop of the skill learning sequence is an internal/external manipulation.

5. *Learners organize responses into patterns and sequences that become more complex*

Piaget considered “thinking” to involve increasingly complex internal representations. Bandura maintained that a rule is learned when a learner moves beyond imitation and is able to chain behaviors in increasing complexity. Chomsky argued for innate rules that allow children to use and understand incorrect grammatical statements, which become refined over time. Gagné felt that learning occurs in a hierarchical sequence of increasingly complex levels. In preparatory audiation, Gordon considered that learners progress from random and purposeful responses to breaking the code and coordination. Similarly, progression through skill and content learning sequence involves mastery of material in increasing depth. Ultimately, a music learner is able to chain responses into patterns that match correct meter and mode, beyond what is already familiar.

6. *Musical understanding involves patterns and chains of patterns that are predictive in nature*

Chomsky considered units of language to be generated in ways that carry meaning. Gagné asserted that verbal associations often occur in chains of words that suggest what may come next. According to Gordon, essential rhythm and tonal patterns function as units of musical meaning, where units of harmonic function are more important than scales. Ultimately, Stage 6 of audiation is defined as the ability to anticipate and predict patterns.

7. *Musical understanding requires awareness of sameness and difference*

For Bandura, awareness of a rule that is held constant by a variety of models requires awareness of when aspects of the task change. Gagné considered labeling patterns or objects with verbal representations to require an awareness of inherent characteristics, which is accomplished by instruction that exposes the differences. Gordon indicated that recognizing differences between patterns is the goal of the aural/oral level of learning, and is accomplished by teaching sameness through imitation and differences through creativity and improvisation.

8. *Musical understanding involves the ability to comprehend contextual meaning*

Vygotsky believed that conceptual meaning changes due to contextual interactions and understandings. When meaning is then attached to the sounds of language, speech is internalized and available for self-regulated thought.

According to Chomsky, syntax governs the organization of phonemes into meaningful patterns that are understood in a context. Gordon discussed syntax in relation to organization of pitches and rhythmic durations. As learners develop audiation skills in tonal and rhythmic context at the partial synthesis level, they begin to understand the relationships and structures of the music. It is imperative for learners to have aural experiences with music in a tonal and rhythmic context in order to understand the syntactical features of the structures and patterns of mode and meter, and to organize these patterns into semantic meaning. When learners emerge from music babble and the aural/oral level, they are aware of context.

9. *Musical understanding involves applying familiar information to unfamiliar information.*

According to Gordon, inference learning is evident when learners are able to take what has been made familiar through discrimination learning and apply it to unfamiliar information. Comparably, Gagné considered concept learning to be evident when learners transfer understanding from familiar to unfamiliar situations and objects. He asserted that generalizability was the final phase of learning, and reflected higher order thinking.

10. *Learners construct musical knowledge by progressing through a series of prerequisites*

Piaget felt that children acquire schema as they move through a necessary series of discrete stages. For Bandura, learning follows a process that begins with attention and is worked out through rehearsal. Gagné specifically built prerequisites into his hierarchies of learning. Gordon’s Music Learning Theory is based on the assumption that levels and sublevels of skill learning sequence, tonal learning sequence, rhythm learning sequence, and pattern learning sequence are necessary for appropriate and efficient musical development.


Conclusion

Learners construct musical thinking and achieve musical independence through processes of observing, imitating, internalizing, and demonstrating. Environmental, cognitive, individual, and social factors work together to create meaning from and foster understanding of musical elements. If music teachers design instruction mindful of the ten principles of music learning shown here to be supported by theories of learning and Music Learning Theory, musical development may be cultivated and nurtured in positive ways.

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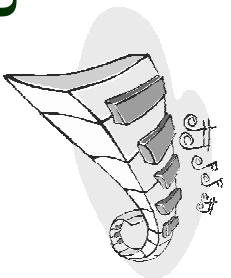
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