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### The Stages of Music Audiation: A Survey of Research

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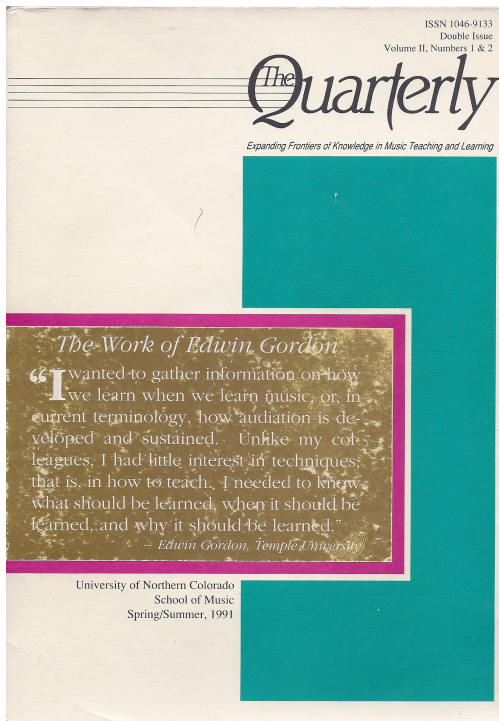
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“Composers and performers engage in imagination imagery as they create music in their minds through composition, improvisation, and interpretation. Gordon would classify these imagination imagery experiences as audiation.”

*--William H. Trusheim*

### *Section 5: Audiation*

# The Stages of Music Audiation: *A Survey of Research*

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**W**e listen to music with musical understanding when we are able to discern an order of sound presentation. Hearing sounds as music is dependent on the ability to recognize a relationship among different aural features of a vocal or instrumental performance. The specific relationship of the tonal, rhythmic, and expressive elements of an aural event provides for the music definition of the event. Aural definition is the basis for the attachment of elemental music meaning or music syntax. The present progressive perception of music performance would be meaningless if the human mind was unable to assimilate the syntactic features of music. Among young children, the ability to mentally establish music syntax is necessary for the subsequent establishment of a sense of tonality and meter. A more advanced understanding of music can be further demonstrated by the successful recognition, identification, or manipulation of tonal and rhythm music content.

With the use of his coined word "audiation," Gordon (1989) offers a definition of the cognitive functions of the human mind and an explanation of how a person creates organized music meaning for aural events. Audiation, as it is described by Gordon, is the mental "ability to hear music which is not physically present" (1989, p. 3). Audiation involves mental recall, prediction, and conception (Walters, p. 5).

Gordon describes audiation as the essential cognitive function which not only enables persons to give meaning to music when listening but also enables them to bring order and meaning to music which is read, written from dictation, recalled from the past, written from recall, created or improvised, or composed. The seven different types of audia-

tion delineated by Gordon (1989, pp. 10-20) are overt and covert music behaviors in which audiation is the enabling psychological construct (see Figure 1). Gordon indicates that the ability to internalize and bring organization to the aural structures of music through audiation is necessary for the meaningful manipulation of those structures as art.

In his description of audiation, Gordon also describes the mental processes activated during the execution of music behaviors.

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*“With the use of his coined word audiation, Gordon offers a definition of the cognitive functions of the human mind and an explanation of how a person creates organized music meaning for aural events.”*

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Gordon speculates that audiation includes five different stages of aural retention and organization (see stages I - V, Figure 1) plus a single stage of aural conception and organization (Stage VI, Figure 1). Audiated music meaning is attached to sounds through the use of a mental comparison process in which sounds (tonal and rhythm patterns) initiated in the mind by perception, recall, or creativity are immediately remembered and organized. Then, instantly, the most recently remembered tonal and rhythm information (patterns) are compared and contrasted to tonal and rhythm information organized and remembered from the near and more distant past. Music meaning (syntax) is established through the audiated mental retention of the order and substance (tonal and rhythm

patterns) of music most recently heard (read, recalled, or created) with the contrast and comparison of the order and substance of music heard (read, recalled, or created) a short and long time ago.

Audiation recall and contrast, and the subsequent recognition and ordering of music also triggers an additional audiation process: the mental prediction of the order and substance of music which might occur in the near future. Predicted musical order and substance then is compared to that which was heard, read, recalled, or conceived in the immediate, near, and distant past to create even greater music meaning. The more accurately individuals are able to confirm their predictions of music order and substance, the better they have established music understanding.

### Research

There has been a great deal of research done by Gordon and others to substantiate the rudimentary concept of audiation: the mental retention and organization of music

which is not physically present. The role of tonal and rhythm audiation in the assessment of developmental and stabilized music aptitudes has been identified, along with the relative degree of audiation proficiency found within early childhood, adolescent, and adult populations (DeCarbo, 1981; Forsythe, 1984; Geissel, 1985; Gordon, 1979, 1980, 1981, 1984; Holahan, 1983; Holahan & Thomson, 1981; Jessup, 1984; Rutkowski, 1986; Webb, 1984; Woodruff, 1984).

There is, however, relatively little research to corroborate Gordon's more detailed speculation identifying and defining the six different stages of audiation or their role in the seven different types of audiation. There are only two specific research reports in which there is an attempt to examine the different stages of audiation. It is these two reports which will be examined.

### The Gordon Study

Gordon (1985), working with 27 kindergarten students, attempted to "substantiate objectively the stages of audiation," (p. 35)

#### *The Seven Types of Audiation*

- I. Listening to familiar and unfamiliar music
- II. Reading notation of familiar and unfamiliar music
- III. Writing from dictation familiar and unfamiliar music
- IV. Performing from recall familiar music
- V. Writing from recall familiar music
- VI. Creating or improvising unfamiliar music
- VII. Composing music

#### *The Six Stages of Audiation*

- I. Retaining in terms of immediate recall a series of notes aurally perceived
- II. Silently imitating and retaining essential notes determined from the recognition of pitch center and the placement of beats
- III. Consciously establishing tonality and meter
- IV. Consciously retaining patterns of essential notes that have been perceived and organized earlier in the same music presentation
- V. Consciously recalling patterns of essential pitches and durations organized from other pieces of music
- VI. Prediction of patterns of essential notes that will be perceived in the near future

**Figure 1.** Gordon's Types and Stages of Music Audiation

and “to determine whether the stages of audiation are common to both tonal audiation and rhythm audiation.” At this time, in 1985, Gordon theorized that there were only five different stages of audiation. He later modified his ideas to include the sixth stage (Gordon, 1989, pp. 10-20).

**Procedures.** The students were first administered (day 1 and day 2) both the tonal and rhythm subtests of Gordon’s (1979) *Primary Measures of Music Audiation* (PMMA). For the next three days, students were excused from their classrooms to be individually evaluated in their ability to perform two tonal patterns (day 3) and two rhythm patterns (day 4) and two combined tonal and rhythm patterns (day 5).

For every evaluation, students were asked to perform vocally using the following listen-respond procedure:

- (a) a pattern was performed on a keyboard synthesizer;
- (b) the child was asked to echo sing (echo chant) the pattern;
- (c) a second pattern was performed on the keyboard synthesizer;
- (d) the child was asked to echo sing (echo chant) the second model pattern;
- (e) without hearing the two patterns again, the child was asked to sing (chant) the two patterns in succession;
- (f) without hearing the two patterns again, the child was asked to sing a song which included patterns like those heard and sung (chanted) earlier;
- (g) both patterns were performed in succession on the synthesizer; and
- (h) the child was asked to perform more patterns vocally which, when put together, created a song.

According to Gordon, steps b and d of the evaluation procedure were undertaken to gather information about Stage II of audiation, Step e related to Stage III, Step f to Stage IV, and Step h to Stage V. Each student performance was less than five minutes in length and was tape recorded for subsequent evaluation.

A tonal rating scale and a rhythm rating scale, each with five subparts, were used to determine levels of student performance capability. Only the results from the use of the tonal rating scale and rhythm rating scale

for the students’ combined pattern performances (day five) were reported because “the results for the tonal patterns void of rhythm, and the rhythm patterns void of melody, were highly similar to the results for the combined patterns” (Gordon, 1985, p. 41).

The PMMA means and standard deviations and split-half reliabilities were reported to be similar to those for the standardization sample found in the PMMA manual. In addition, suitable reliabilities were found for the judge-rejudge evaluation of the five different vocal tasks, with one exception. No reliability was reported for Step f of the procedure (without hearing the patterns again, each child was asked to sing a song which included the two previously performed patterns) due to an overall lack of student response.

To infer the existence and relative strengths of the stages of audiation, the means and standard deviation for the five subparts of the tonal rating scale and rhythm rating scale were examined. It was reported that because the number of possible points among the different subparts of the rating scales was different, no statistical analysis was appropriate. For this study, Gordon’s evaluation of mean difference among the subparts of the two rating scales is based primarily on practical rather than statistical significance. For both tonal and rhythm audiation, the observed means indicated that the kindergarten students were:

- (a) capable of stages I, II, and III,
- (b) less capable of Stage V, and
- (c) incapable of Stage IV.

Gordon also reported intercorrelations among the subparts of the tonal and rhythm rating scale to determine “a direct method for interpreting the relationships among the stages of audiation” (Gordon, 1985, p. 44). The relationships among the stages of tonal audiation and relationships among the stages of rhythm audiation were similar, suggesting that “the processes of tonal and rhythm audiation are nearly the same” (Gordon, 1985, p. 49). Student scores from the *Metropolitan Readiness Tests* (Nurss & McGauvran, 1976) were also correlated with the five subparts of the tonal rating scale and rhythm rating scale and with the PMMA

tonal, rhythm, and composite scores.

The students were also rated on a scale of one to five by their regular classroom teachers in regard to their academic ability. Those scores were correlated with PMMA tonal, rhythm, and composite scores. Teachers' student academic ratings were also correlated with scores from the *Metropolitan Readiness Tests*. The results indicate that there is no relationship between children's developmental tonal aptitude and their ability to audiate at any stage of tonal audiation. There is, however, a relationship between children's developmental rhythm aptitude and their ability to audiate at all stages of rhythm audiation combined. Gordon also reported essentially no relationship between children's academic readiness and their abilities to audiate tonally or rhythmically.

### The Taggart Study

Taggart (1989) reasoned that because "... it is possible that the children in the Gordon study were more skilled at audiation than they were at performance" (p. 20), she attempted to identify the type and nature of the tonal stages of audiation by asking students to answer questions in reference to specific melodic pattern presentations rather than by asking them to complete vocal performance tasks.

While the purpose of Taggart's research was similar to Gordon's, it was different in many respects. Taggart restricted her investigation to examine only the tonal dimension of music audiation, she included both major and minor melodic content, and her students were introduced to some of the tonal patterns prior to the administration of the criterion measure. Taggart investigated the following specific research problems: first, to determine whether the stages of tonal audiation as theorized by Gordon are hierarchical in young children regardless of chronological age, and second, to determine the extent to which the tonal music aptitude of young children is related to the stages of tonal audiation (Taggart, 1989, p. 12).

**Procedures.** Taggart worked with 43 second grade students and 38 fourth grade students who received eight 15-minute periods of tonal pattern instruction. During a four-week period, students were asked to

listen to and answer questions about tonal-specific, tonal-pattern presentations in preparation for the administration of the *Test of the Stages of Tonal Audiation* (TESTA), designed by Taggart. Prior to instruction, all of the students were administered Gordon's (1984) *Intermediate Measures of Music Audiation* (IMMA). The TESTA was administered to the students by the researcher in order to determine students' capabilities of each stage of audiation. Students were released from normal class activities and individually tested for a period of ten minutes in the following manner:

- (a) The students listened to a recording of a short song, after which they heard a two-pitch tonal pattern and were asked if the given pattern was the pattern most commonly heard in the song.
- (b) The students listened to a preparatory tonal sequence (eight-pitch series to set tonality), after which they were asked to listen to a short song. Following the song, a single pitch was presented, and the students were asked if the given pitch was that which should have ended the song.
- (c) The students listened to a preparatory sequence after which they heard a short song. After the song, a short tonal pattern was presented and the students were then asked if the given tonal pattern was part of the song.
- (d) The students listened to a tonal preparatory sequence, after which students listened to two familiar and one unfamiliar songs. Then another preparatory sequence was performed, after which four different pairs of tonal patterns were presented, and the students were asked from which of the four songs the tonal patterns were taken.
- (e) The students listened to a tonal preparatory sequence, after which they listened to a succession of three consecutive tonal patterns. After a short period of time, a fourth pattern was presented and the students were asked if the fourth pattern would be appropriate as the succeeding pattern in the song.

**Conclusions.** Each of the five evaluation procedures was repeated four times, with the use of four different songs and four different individual or sets of tonal patterns. Students were asked to listen and respond verbally to two familiar songs (learned during a prior four-week instruction period) and two unfamiliar songs (1 major and 1 minor).

Taggart claimed that evaluation Step (a) was undertaken to gather information about Stage II of audiation, Step (b) - Stage III, Step (c) - Stage IV, Step (d) - Stage V, Step (e) - Stage VI. Means, standard deviations, and Kuder-Richardson 20 reliabilities were reported for each of the subparts of the TESTA. The reliability coefficients were nearly all considered low for a test designed to measure individuals. An item analysis and item discrimination were calculated, revealing that a majority of the items of TESTA were low-positive or negatively discriminated items. The means between grades and between subtests of the TESTA were not examined with the use of tests of significance. Instead, the means and standard deviations were examined for trends, which indicated results contrary to Gordon's earlier research. Low intercorrelations among the subtests of the TESTA and between the tonal tests of the IMMA were found. Those results are not surprising, given the low reliabilities of the TESTA.

### Summary

Gordon's speculative description of the six stages of audiation and his detailed characterization of their role in the mental attachment of music meaning to organized sounds is certainly based in logical thought and reasoning. In his attempt to describe a complex mental process, Gordon has given us a series of specific terms of definition and description with which to think about the acquisition of meaning for music. Appropriately, Gordon and Taggart have sought to confirm his theory of different stages of audiation through the collection of objective evidence. Both researchers sought to isolate specific tasks of music behavior in order to gather data to confirm the different psychological constructs of music audiation.

An examination of the behavioral task and the method with which task success was measured must be considered in conjunction with the research results. Gordon evaluated students' vocal demonstrations of immediate recall and creative response in relation to sets of performed tonal and rhythm patterns. In contrast, Taggart evaluated students' abilities to recognize and identify music content with the use of spoken language.

Gordon's behavioral task required the demonstration of a musical response, whereas Taggart's task required a verbal interpretation of music stimuli.

Gordon's use of additive rating scales was much more successful in the assessment of student task performance than was Taggart's verbal response evaluation process. Gordon's reliability coefficients were nearly all acceptable for purposes of evaluating individual performance. In contrast, Taggart's evaluation procedure, in which students answered three "yes" or "no" questions and one four-option response question, yielded low reliabilities. Unfortunately, the lack of reliability of the criterion measures makes interpretation of Taggart's results difficult. Throughout her report, Taggart offers accurate interpretations as to why the measurement results were insufficient. It was disturbing, however, to read in her conclusions, the importance Taggart attached to results that were unreliable in their origin.

Perhaps measuring students' abilities to recognize and identify music content through verbal responses might yield more consistent results if a greater number of questions were asked within each TESTA subtest. Yet children's fatigue and decreased attention spans due to prolonged testing procedures would require fewer subtests to be administered (and thus fewer corresponding stages of audiation to be investigated) at one time.

Gordon's use of additive rating scales, although consistent in empirical results, is difficult to interpret in reference to corresponding stages of audiation. The number Gordon assigned to a child's performance with the use of an additive rating scale represents the total number of rating-scale criteria observed in relation to the performance. Each criterion, within each subpart of the tonal or rhythm additive rating scale, depicts an observable characteristic of vocal performance which may or may not be mutually dependent to other criteria included in the scale. Therefore, the assigned number does not indicate, as with the use of *continuous* rating scales, a degree of performance ability along a continuum of performance criteria. As a result, an additive rating scale provides an indication of overall perform-

ance capability, not an indication of observed hierarchical levels of performance. Thus, audiation capability is not specifically described by Gordon in reference to continuous levels of task success. While the observance of a specific stage of audiation may be claimed with the use of additive rating scale, the quality or character of the performance capability as an indicator of a specific stage of audiation remains unclear. Understandably, in his initial investigation of the different stages of audiation, Gordon wished to determine overall performance capability.

### Futher Research Indicated

In the future, levels of vocal task performance should be investigated to provide additional information about the stages of audiation. It may be true that within different age groups (or levels of achievement) students audiate by engaging in each of the stages of audiation but with differing degrees of specific success or sophistication.

Both Gordon's and Taggart's studies are preliminary investigations which provide initial confirmation of the different stages of audiation, but both studies raise many additional questions about the nature of music audiation and how it may be examined. The need has been mentioned to determine additional music performance tasks and methods for evaluation to corroborate or refute the research results already gathered; an added number of music behaviors and tasks, which correspond to the seven different types of audiation, need to be examined to determine the role and contribution of the six stages of audiation within each form of music behavior. Moreover, additional research is needed to investigate the nature of the stages of audiation among persons of different age levels and within different achievement groups.

Much also could be learned from a thorough investigation of language-acquisition and linguistics research in order to gain a greater understanding of various mental functions attached to language ability and how they might correspond to, or be uniquely different from, those identified with music audiation. Research methods and procedures may be found and successively brought to the research of music audiation.

Also needed are physiological descriptions of the brain in relationship to the unique brain functions associated with the different stages of audiation and to provide further objective evidence of their existence.

Gordon and Taggart must be applauded for their initial efforts. Much more conclusive evidence must be gathered, however. A greater understanding of audiation is essential, because the mental process of audiation is at the very core of music comprehension and performance capability. A greater understanding of how the mind brings organization and meaning to sounds as music would provide far-reaching implications to the process of music teaching and learning. Gordon has provided us with a powerful theory which needs further objective investigation.

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