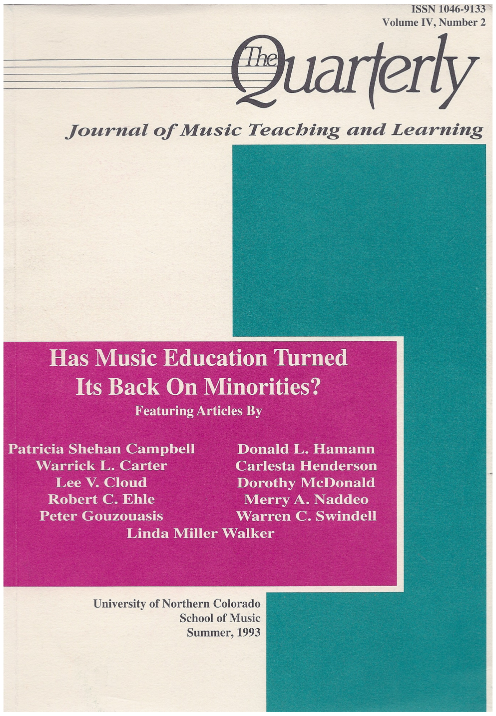

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It is with pleasure that we inaugurate the reprint of the entire seven volumes of The Quarterly Journal of Music Teaching and Learning. *The journal began in 1990 as* The Quarterly. *In 1992, with volume 3, the name changed to* The Quarterly Journal of Music Teaching and Learning *and continued until 1997. The journal contained articles on issues that were timely when they appeared and are now important for their historical relevance. For many authors, it was their first major publication.* Visions of Research in Music Education *will publish facsimiles of each issue as it originally appeared. Each article will be a separate pdf file. Jason D. Vodicka has accepted my invitation to serve as guest editor for the reprint project and will compose a new editorial to introduce each volume. Chad Keilman is the production manager. I express deepest thanks to Richard Colwell for granting VRME permission to re-publish* The Quarterly *in online format. He has graciously prepared an introduction to the reprint series.*

Music Audiation: A Comparison Of The Music Abilities Of Kindergarten Children Of Various Ethnic Backgrounds

By Peter Gouzouasis

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Music aptitude maybe considered as potential to achieve in music (Gor don, 1989). It is a product of nature, in the form of biological organization and innate abilities; and of nurture, in the form of environmental influences and early childhood music experiences. Both are vital to the degree of music ability one may consequently possess. Those beliefs are based upon organismic principles of development.

Researchers who adopt an organismic world view (Pepper, 1942; Overton, 1976) believe that developmental change is an inherent process. From an organismic perspective, change is necessary (Overton & Reese, 1981). Overton (1984) uses a plant metaphor to explain that historical events affect the rate, amount of change in growth, and final level of growth. For example, a plant may not receive optimal water or sunlight to insure full growth, but it will develop based upon biologically determined patterns of growth. The plant may wilt and die prematurely, but it will nevertheless grow to some extent. That is because in an organismic model, "change is basic" (Overton & Reese, 1981). Central to the organismic model is the Kantian-Heglian philosophy of the nature of reality, where development is a state of becoming (Overton, 1976). By definition, to become something is to change; therefore, change and becoming are basic features of development. Overton (1976) proposes that change, based on these concepts is inevitable and that change is not fully explainable in cause-and-effect contingencies.

There may be many components that influence music development, but one must consider genetic and environmental factors to explain developmental function in an active organism model (Overton, 1976). The notion of internal structures and processes that guide development was proposed by Gesell (1929, 1934). He conducted exhaustive cross-sectional and longitudinal observational research of infants and was able to describe with detail the sequence and timetable of the emergence of early motor abilities. It was Piaget (1973) who propagated the notion that abilities and skills emerge in a process explained by principles of accommodation and assimilation. He believed that innate abilities govern the development of new skills, and that those skills are used to organize new experiences into new cognitive structures (concepts). It is an organismic-constructivist position of how children learn, where children actively construct that which they come to know (Overton, 1976).

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Audiation in an Organismic Model

From an organismic-epistemological position, both concepts, in the form of audiation, and percepts, in the form of aural perception, play an important role in the music learning process. Also, both music aptitude and music achievement play a role in our understanding of the music learning process. While perception and conception are related, they are not the same. Furthermore, music perception, in the form of auditory sensation, is not the same as music cognition. In an organismic model, cognition is thought, and thought is conceptual. Concepts are mental constructions, whereas percepts are the result of external experiences (Overton, 1984). Whereas conception implies cognitive activity of the organism, perception implies environmental activity on the organism. Specifically, concepts are internal, percepts are external. We perceive music events in our environment and may create music based upon what we perceive and audiate. We may also, however, audiate and create novel music utterances that are not based upon prior music perceptions.

> In an organismic model, cognition is thought, and thought is conceptual. Concepts are mental constructions, whereas percepts are the result of external experiences.

From an organismic-constructivist perspective, audiation is the ability to conceptualize music sound without the sound being physically present (Gordon, 1989). Like thinking, audiation is a cognitive process. In a sense, one may consider audiation as aural conception and auditory sensation as aural perception. Although music listening is an important music activity, one may not need to perceive a music stimulus to audiate music. An example is the jazz musician who is able to create novel melodic patterns, which have not been heard before, in improvisation. People audiate when they compose music, improvise music, listen to music, read music, write music that has been previously heard, and recall music (conceptually) that has been previously heard (Gordon, 1989). All of the aforementioned music activities are cognitive, that is conceptual activities. A person's ability to audiate will greatly influence the way that he or she organizes music sounds (in terms of tonal and rhythm patterns, form, texture, timbre, dynamics, etc.) and will greatly influence the way he or she produces music (through singing, chanting, moving, reading, and writing music, and performing on instruments).

It is only since the 1970s to 1980s that some music educators have defined musical ability as audiation ability. Audiation is considered an innate ability. While it is hypothesized that all humans can audiate music and that some audiate more or less than others, audiation will develop at varying rates and amounts (Gordon, 1990). The development of audiation may also be considered as "biologically patterned and necessary" (Overton, 1984, pp. 207-213), although an individual's audiation ability may be affected by environmental events over time. Based on the notion that there are immense differences in amount of exposure to music, in degree of exposure to music, and in the variety of music styles, it may be hypothesized that audiation ability emerges at different developmental rates. Based on theory (Gordon, 1989), numerous studies (see Schleuter, 1991), and practical classroom applications, many music educators believe that audiation is the best indicator of the potential to achieve in music (Gordon, 1989; Gouzouasis, 1991).

A small portion of the organismic model has been studied in a music learning context. The first applications of Piaget's work in music education research were primarily concerned with his principles of conservation (Botvin, 1974; Foley, 1975; Jones, 1976; Norton, 1980; Pflederer, 1963, 1964, 1967; Pflederer & Sechrest, 1968). Although the idea of stage development is central to his model, this aspect of his work has had little impact on the way that researchers explain music learning. Only recently (Gordon, 1990) has a music educator attempted to describe in detail, with a stage model, the emergence and equilibration of music abilities and skills. Moreover, relatively few music researchers have examined the nature of innate music abilities.

Developmental Music Aptitude in an Organismic Model

In the United States, standardized music aptitude tests are used to gather highly reliable measures of aptitude for children of kindergarten through college age. The *Primary Measures of Music Audiation* (PMMA) (Gordon, 1979) is used in the United States to evaluate the developmental music aptitude of kindergarten through third grade children. Developmental music aptitude scores are extremely valuable to music educators who are interested in the music learning process and in the improvement of music instruction for children. In practice, a teacher is able to teach to children's individual audiation levels, develop children's use of their tonal and rhythm audiation abilities, and help children use their abilities in the acquisition of music skills.

A child's music aptitude (audiation ability) fluctuates during childhood as a result of music and other environmental influences. Because of that fluctuation, music aptitude as measured by PMMA is considered developmental because audiation ability develops through age nine (Flohr, 1981; Gordon, 1979, 1979a, 1980; Gouzouasis, 1987; Levinowitz, 1987). In other words, with appropriate music instruction, PMMA raw scores of individual children may increase

1. when compared to the previous scores on PMMA of that individual child (idiographically) and
2. when compared to an individual child's standing within the overall group of scores with which the child may be compared (normatively).

After age 9, it is hypothesized that a child's audiation equilibrates in the stabilized aptitude stage of structural development.

The implication is that Gordon's (1989) audiation model has a teleological (terminal) level of growth. That implication applies to the music aptitude, but not the achievement aspect of audiation development. Although a child's audiation level may peak at an individual maximum level, a child may continue to learn skills to access and activate audiation at an individual maximum level. The position is not uncommon in an organismic model, because numerous emergent abilities and biological structures level off at maximum levels. An example is that humans grow to a biologically determined, maximum individual height and attain that height at a particular age. Similarly, one may hypothesize that children develop to a biologically determined level of audiation, which may increase or decrease based on environmental influences and music experiences, and attain a maximum audiation level at age 9.

Nurture, in the form of environment, is an important factor of music development in an organismic model. Research with regard to the relationship between audiation abilities and music environment seems inconclusive. Also, it has not been conducted with young children (birth through age 5), where it is hypothesized that environmental influence may have the greatest impact on developmental audiation abilities. For 213 fifth and sixth grade students, Gordon (1973) found significant relationships between parents and siblings playing and singing in the home and Tonal Imagery scores on the *Musical Aptitude Profile* (MAP) (Gordon, 1965). Significant relationships were also discovered between the presence of a piano in the home and attendance of concerts with Tonal Imagery, Rhythm Imagery, Musical Sensitivity, and Composite MAP scores.

Brand (1982), however, found no relationships between environmental factors as measured with the Music Environment Questionnaire and audiation as measured with MAP for sixth grade students. Moreover, in a more recent study, Brand (1986) discovered no significant relationships between music environment as measured with the Home Musical Environment Scale (Brand, 1985) and audiation ability as measured with PMMA for second grade students.

Music aptitude is considered as normally distributed throughout the population of kindergarten through twelfth grade children in the United States. Holahan and Thomson (1981) studied the validity of the use of PMMA in an urban setting in England with a predominantly Caucasian sample of children. Relatively few researchers (Gordon, 1979a, 1979b, and 1980; Gouzouasis, 1987) have studied the developmental music aptitudes of children in urban settings in the United States, and there are apparently no studies in the music education research literature that assess the relationship of children's ethnic heritage to their developmental music aptitudes. Also, before this study was conducted, there were no studies in the education research literature that specifically assessed the nature of music aptitude (as defined by audiation) of Canadian children.

With the intent of learning more about the nature of music aptitude, the purpose of this research was to develop an understanding of the relationship between the music aptitudes of young children who are of various ethnic backgrounds and of the same national population. The specific problem of the study was to determine if there is a difference between the developmental tonal and rhythm music aptitudes of five-year-old Canadian children who are of Chinese ethnic background, East Indian (Sikh) ethnic background, and Western European ethnic background (English, Scottish, Irish, German, French, Spanish, Portuguese, Greek, and Italian).

Sample

The availability sample of students who participated in this study were 281 5-year-old children (91 children of Chinese ethnic background, 76 children of East Indian [Sikh] ethnic background, and 114 children of Eurocanadian ethnic background) who attend elementary schools in the Vancouver School District. These ethnic groups were selected for study because of the diverse characteristics of musical culture in these groups and the large ethnic Chinese and East Indian populations in British Columbia's Lower Mainland.

The sample of music aptitude scores was gathered by testing kindergarten children in schools within the school district that have high concentrations of children from Chinese and East Indian ethnic households. All of the Chinese and East Indian children who participated in the study may be considered to speak English as a second language. Eleven children's scores were not included in the sample data because the classroom teacher and researcher determined that those children did not yet understand the English language; hence, they did not understand the test instructions. Rather than actively participate in the test-taking tasks, those children either scribbled on the test sheet or penciled in the numerous objects (spoon, car, boat, shoes, etc.) that identify each test example.

Procedures

The two subtests (Tonal and Rhythm) of PMMA were administered to all of the children according to the standardized directions (Gordon, 1979a). As is suggested in the test manual, the subtests were administered on successive days, constituting two 25-minute sessions. Testing for all children occurred within a 25-day period. In the standardization sample, reliability coefficients for the Tonal, Rhythm, and Composite scores are .85, .72, and .90, respectively (Gordon, 1979a).

The PMMA scores were organized into two one-dimensional designs. For each design, ethnicity was considered as the group dimension and developmental music aptitude (either tonal or rhythm) was the dependent variable. Means, standard deviations, and standard errors of measurement of the PMMA scores were calculated. A one-way analysis of variance was used for each design to determine if there were differences between the tonal and rhythm aptitude scores of the three Canadian ethnic groups. Main effects were tested at the .05 level of significance.

Results

As can be seen in tables 1 and 3, split-halves reliability coefficients for the Tonal, Rhythm, and Composite scores range from .89 to .95. The researcher believes that the high internal reliabilities may be attributed to the help of each classroom teacher and a research assistant who, with the researcher, performed as test monitors and kept the children focused on task throughout the test-taking activities. Also, there were no apparent testing anomalies (i.e., informal peer interactions and various distraction events) that jeopardized either the reliability of the test or the internal validity of the study during test administrations.

PMMA Tonal Analysis

The means, standard deviations and reliabilities for the PMMA Tonal subtest scores are presented in Table 1. The ANOVA summary for the PMMA scores is presented in Table 2. There is a significant ethnic effect, which indicates that there is a real difference between the mean audiation scores of the cultural groups.

A Scheffé procedure was performed to determine the precise differences among the three groups (see Table 3). The mean for children of Chinese ethnicity is significantly higher than the mean for children of East Indian ethnicity. Also, the mean for children of Eurocanadian ethnicity is significantly higher than the mean for children of East Indian ethnicity.

PMMA Rhythm Analysis

The means, standard deviations, and

Table 1: Means, Standard Deviations, and Reliabilities for the PMMA Tonal Scores

	n	Mean	S.D.	r
Chinese	91	22.58	11.75	.9543
Eurocanadian	114	24.57	9.30	.9232
East Indian	76	18.39	9.56	.9217

Table 2: One-way ANOVA Summary Table for the PMMA Tonal Scores

Source	Sum of Squares	df	Mean Square	F-test	Probability
Between Groups	1757.32	2	876.66	8.38	.0003
Within Groups	29068.23	278	104.56		
Total	30821.55	280			

Table 3: Scheffé Post-hoc Test on the PMMA Tonal Scores. Pairwise Absolute Mean Differences

	East Indian	Chinese	Eurocanadian
East Indian	0.00	-	-
Chinese	4.19*	0.00	-
Eurocanadian	6.18*	1.98	0.00

* p <. 05

Table 4: Means, Standard Deviations, and Reliabilities for the PMMA Rhythm Scores

	n	Mean	S.D.	r
Chinese	91	20.93	9.56	.9213
Eurocanadian	114	21.13	9.88	.9282
East Indian	76	19.81	9.11	.9096

Table 5: One-way ANOVA Summary Table for the PMMA Rhythm Scores

Source	Sum of Squares	df	Mean Square	F-test	Probability
Between Groups	85.59	2	42.79	46	6276
Within Group	25496.51		278	91.71	

reliabilities for the PMMA Rhythm subtest scores are presented in Table 4. The ANOVA summary for the PMMA scores is presented in Table 5. It can be seen in Table 5 that there is no significant ethnic effect in the audiation of rhythm patterns.

Interpretations

As can be seen in tables 2 and 3, when compared to Chinese and Eurocanadian children, there is a significant difference in the way that East Indian children audiate tonal patterns. When compared to Chinese and Eurocanadian children, there is no difference in the way that East Indian children audiate rhythm patterns (see Table 5).

There are two plausible explanations for this outcome. First, developmental music aptitude may be influenced, either positively or negatively, by the child's environment. From that perspective, perhaps the type of music and music experiences (particularly on a tonal/melodic level) that children of Chinese and Eurocanadian ethnicity received prior to testing (in the home or in school) better prepared the children of those ethnic groups to audiate the tonal patterns that are presented in PMMA.

Second, one may consider that there are more similarities on a rhythmic level among the music of Chinese, Eurocanadian, and East Indian cultures than there are on a tonal/melodic level between those three cultures. Relatively few world cultures use tonalities that contain quartertones and microtones. In contrast, some cultures (Middle-Eastern, Indian, African) use complex rhythm patterns, but also use simple rhythm patterns in simple or complex meters. Hence, there was no difference between the audiation abilities of the Chinese, Eurocanadian, and East Indian children for the rhythm patterns presented in the PMMA.

It seems reasonable to suggest that the difference in tonal scores may be due to the tonal content of PMMA rather than due to the actual psychological construct of audiation. On a construct level, audiation is considered an innate human ability, and there is no research to support the notion that either entire ethnic or national groups suffer from deficits in audiation ability. Tonal patterns included in the PMMA, however, are based on the Western diatonic system. Therefore, on a content level, the validity of the Tonal subtest of PMMA may be called into question for use with East Indian children.

Conclusions

Based on the tonal and rhythm subtest reliabilities, one may conclude that children of diverse ethnic groups are able to consistently audiate tonal and rhythm patterns of a Western music system. Children of Eastern cultures seem able to adapt their audiation ability to music, in the form of tonal and rhythm patterns, of a Western music system. Although they were able to discriminate tonal patterns, East Indian children were not able to consistently generalize the tonal syntax of East Indian music to the tonal syntax of Western music. They were, however, able to consistently generalize the rhythm syntax of East Indian music to the rhythm syntax of Western music. There are rhythmic factors that relate the music of Eastern and Western cultures, which seems consistent with the notion of rhythm as a universal factor in world musics. Regardless of rhythm and tonal content similarities and differences, and in light of the fact that all of the children who participated in the study were reliability able to audiate tonal and rhythm patterns, audiation may be considered as a conceptual ability possessed by many peoples of diverse cultural groups.

In consideration of the findings, additional research needs to be conducted with tonal and rhythm pattern audiation difficulty levels to accommodate possible content differences in the music of various cultures. Also, to develop an understanding of the nurture aspect of audiation, the relationships between audiation abilities and music environments of young children should be examined.

References

Botvin, G. (1974) Acquiring conservation of melody and cross-modal transfer through successive approximation. *Journal of Research in Music Education, 22,* 226-233.

Brand, M. (1982) Relationship between musical environment and musical aptitude among sixth-grade children. *(PMEA) Bulletin of Research in Music Education, 13,* 13-19.

Brand, M. (1985) Development and validation of the *Home Musical Environment Scale* for use at the early elementary level. *Psychology of Music, 13,* 40-48.

Brand, M. (1986) Relationship between home music environment and selected musical attributes of second-grade children. *Journal of Research in Music Education, 34,* 111-120.

Foley, E. A. (1975) Effects of training in conservation of tonal and rhythm patterns on second-grade children. *Journal of Research in Music Education, 23,* 240-248.

Gesell, A. L. (1929) Maturation and infant behavior patterns. *Psychological Review, 36,* 307-319.

Gesell, A. L. (1934) *An atlas of infant behavior.* New Haven, CT: Yale University Press.

Gordon, E. (1965) The *musical aptitude profile: Test manual.* Boston: Houghton-Mifflin.

Gordon, E. (1967) A three-year study of the *Musical Aptitude Profile. Studies in the Psychology of Music, 5.*

Gordon, E. (1979) Developmental aptitude as measured by the *Primary Measures of Music Audiation. Psychology of Music, 7,* 42-49.

Gordon, E. (1979a) Pr*imary measures of music audiation.* Chicago: G.I.A. Publications.

Gordon, E. E. (1986) *The nature, description, measurement, and evaluation of music aptitudes.* Chicago: G. I. A. Publications.

Gordon, E. E. (1989) Learning sequences in music: Skill, content, and patterns. Chicago: G. I. A. Publications.

Gordon, E. E. (1990) *A music learning theory for newborn and young children.* Chicago: G. I. A. Publications.

Gouzouasis, P. (1991) A progressive developmental approach to the music education of preschool children. *Canadian Music Educator, 32* (3), pp. 45-53.

Gouzouasis, P. (in progress). An investigation of the developmental rates of change of audiation abilities of kindergarten children. (UBC Ethical Review B92-307). The University of British Columbia.

Holohan, J. M. and Thomson, S. (1981) An investigation of the suitability of the *Primary Measures of Music Audiation* for use in England. *Psychology of Music, 9,* 63-38.

Jones R. L. (1976) The development of the child's conception of meter in music. *Journal of Research in Music Education, 24,* 142-154.

Levinowitz, L. M. (1987) An experimental study of the comparative effects of singing songs with words and without words in children in kindergarten and first grade. (Doctoral Dissertation, Temple University, Philadelphia, PA). *Dissertation Abstracts International, 48,* 863A.

Norton, D. (1980) Interrelationships among music aptitude, IQ, and auditory conservation. *Journal of Research in Music Education, 28,* 207-217

Overton, W.F. (1976) The active organism in structuralism. *Human Development, 19,* 71-86.

Overton, W. F. (1984) World views and their influence on psychological theory and research: Kuhn-Lakotos-Laudan. *Advances in Child Development and Behavior.* (Vol. 18). New York Academic Press.

Overton, W. F. and Reese, H. W. (1981) Conceptual prerequisites for an understanding of stability-change and continuity-discontinuity. *International Journal of Behavioral Development, 4,* 99-123.

Pepper, S. C. (1942) *World hypotheses.* Berkeley: University of California Press.

Pflederer, M. (1963) The responses of children to musical tasks embodying Piaget's principles of conservation. Unpublished doctoral dissertation, University of Illinois.

Pflederer, M. (1964) The responses of children to musical tasks embodying Piaget's principle of conservation. *Journal of Research in Music Education, 12,* 251-268.

Pflederer, M. (1967) Conservation laws applied to the development of musical intelligence. *Journal of Research in Music Education, 15,* 215-223.

Pflederer, M. and Sechrest, L. (1968) Conservation type responses of children to musical stimuli. *Bulletin of the Council for Research in Music Education, 13,* 19-36.

Piaget, J. (1952) *The origins of intelligence in children.* (Margaret Cook, Tr.) New York: International Universities Press.

Schleuter, S. L. (1991) Research studies relevant to the *Musical Aptitude Profile*: A bibliography. *The Quarterly, 2* (1), 78-85.