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„Kultura i Edukacja", ul. Lubicka 44, 87-100 Toruń, tel. 56 660 81 60, 664 22 35,
664 22 36 w. 25, e-mail: info@kultura-i-edukacja.pl, Internet: www.kultura-i-edukacja.pl
Wydawnictwo Adam Marszałek, ul. Lubicka 44, 87-100 Toruń, tel./fax 56 648 50 70
Internet: http://www.marszalek.com.pl, e-mail: info@marszalek.com.pl
Drukarnia nr 2, ul. Warszawska 52, 87-148 Łysomice, tel. 56 678 34 78

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COMMUNICATES–RELATIONS

Beata Bonna
Kazimierz Wielki University in Bydgoszcz, Poland

RESEARCH ON THE APPLICATION OF E.E. GORDON'S THEORY OF MUSIC LEARNING IN THE MUSIC EDUCATION IN POLAND

ABSTRACT

The purpose of this article is the presentation of the results of the research conducted in Poland on the effectiveness of music education realised in accordance with the assumptions of Edwin Elias Gordon's Theory of Music Learning, which holds an important place in the existing systems of common music education. Gordon pays attention to the need of undertaking the earliest possible music interactions when it comes to children. Some observations conducted among pregnant women and infants during music activities being realised in accordance with the assumptions of Gordon's theory showed that infants display some reactions indicating the recognition of the music presented before the birth. They also demonstrated that these children reacted to music earlier than the infants who were not musically stimulated in their prenatal period. The experimental research conducted among children at pre-school age and early-school age proved greater, compared to the traditional methods, effectiveness of the interactions resulting from Gordon's Theory of Music Learning in the development of their music aptitudes and musical achievements[1]. Moreover, they also

[1] Gordon uses the term 'music aptitudes' which refers to aptitudes for learning music, however the term 'musical achievements' defines the achievements (understood as 'skills') which are formed during the process of music learning. A human being is born with an aptitude potential, whereas the skills are acquired. Therefore, Gordon uses a clear distinction between these terms (E. Gordon, *Teoria uczenia się muzyki* [A Music Learning Theory] [in:] *Podstawy teorii uczenia się muzyki według*

proved that the stimulation of music aptitudes contributes to the development of children's perceptive-motor functions especially in the context of developmental shortages compensation. Other research confirmed the validity of E.E. Gordon's thesis about the existing relation between instrument timbre preference and the achievements in playing them.

Key words:
E.E. Gordon's Theory of Music Learning, audiation, music aptitudes, musical achievements, effectiveness of music stimulation in prenatal period, effectiveness of music education of children at pre-school and early-school age, instrument timbre preference and the achievements in playing

1. Introduction

The results of the research presented in the article and related to the effectiveness of music education, realised according to Edwin Elias Gordon's concept, seem particularly vital when the fact that the common music education in Poland is neglected is taken into consideration.

Despite the constant presence of music in youngsters' lives, the level of their musical achievements is poor, which negatively influences the cultural competences of the society[2]. Moreover, there also arises a problem of awakening the need of contact with music of high artistic values, through which complete participation in the music culture is possible, which is an integral part of the broad definition of culture. The participation in the music culture characterised by high artistic values is connected with the need of noticing and comprehending a lot of complex aspects of music, which requires proper aptitudes and adequately shaped musical competences.

Considering the lack of interest of the governing bodies in the quality of music education in Poland, it is important to look for some new solutions in this domain, which will optimise children's musical development. One such solution is the application into the system of common education of E.E. Gordon's Theory of Music

Edwina E. Gordona [Basics of Music Learning Theory According to Edwin E. Gordon], E. Zwolińska (ed.), Bydgoszcz 2000, pp. 46–47. This article also uses these terms in that meaning. Moreover, with the meaning of the term 'music aptitude' another term 'music ability' will also be used.

[2] A. Weiner, *Kompetencje muzyczne dzieci w młodszym wieku szkolnym. Determinanty, zależności, perspektywy rozwoju* [Music Competence of Early School Age Children. Determinants, Dependences, Progress Perspectives], Lublin 2010, p. 345.

Learning (GTML) based on the audiation processes – understanding music as an alternative concept of children's music education.

In the pluralistic conception of common music education existing in Poland, the impact of C. Orff's, E. Dalcroze's, Z. Kodaly's, and J. Mursell's systems is noticeable. This conception is an effect of common efforts of many Polish educators working under the supervision of M. Przychodzińska, as well as many other authors, including Z. Burowska, Z. Konaszkiewicz, W. Jankowski, and E. Rogalski. It is based on such activities as music perception, singing, playing instruments, movement with music, and the learners' musical creative activity "being an attempt of joining the 'traditional' approaches to music teaching with the ideals of the 'creativity and expression' pedagogy"[3]. The Polish concept emphasizes the creation of musical sensitivity, musicality, and musical culture; it also pays attention to educational functions of music, creating various personality features, as well as perceiving values in music[4]. This concept, however, does not refer to the sequence being so vital and distinctive of Gordon's Theory of Music Learning, in which music should be learned to be understood well, combining knowledge of sequential music learning with knowledge of musical abilities and audiation[5]. Presumably, this extremely consistent approach of Gordon's theory to the process of music learning causes that its popularity in Poland is still increasing. However, Gordon's concept has been rarely taken up in the Polish scientific discourse, which can prove its high effectiveness in developing children's aptitudes and forming their musical achievements.

Gordon's Theory of Music Learning was first presented Radziejowice, Poland in 1991. The seminar was organized by the Institute of Musical Pedagogy of the former Fryderyk Chopin Musical Academy in Warsaw (now the Fryderyk Chopin

[3] A. Białkowski, *Polska koncepcja powszechnego wychowania muzycznego a współczesne spory o edukację* [Polish Concept of Common Music Education and Contemporary Arguments on Education] [in:] *Bliżej muzyki. Bliżej człowieka* [Closer to Music. Closer to Man], A. Białkowski, B. Smoleńska-Zielińska (eds.), Lublin 2002, pp. 144, 147.

[4] See: M. Przychodzińska-Kaciczak, *Polskie koncepcje powszechnego wychowania muzycznego. Tradycje-współczesność* [Polish Concepts of Common Music Education. Tradition-Contemporary Times], Warszawa 1987; M. Przychodzińska, *Wychowanie muzyczne – idee, treści, kierunki rozwoju* [Music Education – Ideas, Contents, Development Directions], Warszawa 1989.

[5] E.E. Gordon, *Sekwencje uczenia się w muzyce. Umiejętności, zawartość i motywy. Teoria uczenia się muzyki* [*Learning Sequences in Music Skill, Content, and Patterns. A Music Learning Theory*, Chicago 1980], Bydgoszcz 1999, p. 50; see also: E.E. Gordon, D.G. Woods, *Zanurz się w program nauczania muzyki. Działania w kolejności uczenia się. Podręcznik dla nauczycieli* [*Jump Right In. The Music Curriculum. Reference Handbook for using Learning Sequence Activities*, Chicago 1992], Bydgoszcz 1999; E.E. Gordon, *Preparatory Audiation, Audiation, and Music Learning Theory*, Chicago 2001; B. Bonna, *Podstawy Gordonowskiej metody zespołowego nauczania gry na instrumentach muzycznych* [Foundations of Gordon's Method of Team Teaching to Play Musical Instruments], Bydgoszcz 2011.

Musical University) headed by Wojciech Jankowski. The next seminars, with the participation of E.E. Gordon, were held on a regular basis in the Polish cities of Krynica (1995), Zamość (1998), Bydgoszcz (2001; 2006), and Ciechocinek (2004). The seminars were led by E.E. Gordon along with R.F. Grunow and Ch. D. Azzara (USA), who are also presently engaged in the popularization of GTML in Poland. The list of foreign guests who propagated E.E. Gordon's theory in the recent years in the form of lectures, workshops, concerts and performances also included A. Apostoli (Italy) and H. Rodrigues (Portugal).

Since 1996, Edwin E. Gordon Association, gathering people interested in GTML and its adaptation to the Polish common music education system, has been acting in Poland. E.E. Gordon's music aptitude test – *Intermediate Measure of Music Audiation* (IMMA) – received Polish standardization and also a few of his books were translated. In 2004 the Kazimierz Wielki University in Bydgoszcz launched a specialisation of Early-school Pedagogy and Musical Education according to Edwin E. Gordon in the Faculty of Pedagogy, where the teachers are prepared to develop audiation aptitudes in children and conduct music lessons according to the assumptions of the Music Learning Theory. It is worth mentioning that it is the only, for the time being, university in Poland which educates the students in this specialisation.

2. Gordon's Theory of Music Learning

The Theory of Music Learning, created after decades of intense empirical research by American pedagogue and music psychologist E.E. Gordon, is an innovative approach to children's music education. It holds an important place next to the acknowledged systems of music education by C. Orff, E. Delcroze, and Z. Kodaly.

The research verifying the effectiveness of the theory in educational practice, conducted by E.E. Gordon and other scientists, caused the development of knowledge of music aptitudes, audiation, processes of music learning, and musical development of infants and small children[6]. The author of the concept was the first

[6] See: E.E. Gordon, *Developmental Music Aptitudes Among Inner-City Primary Grade Children*, "Council for Research in Music Education" 1980, No. 63; E.E. Gordon, *Research Studies in Audiation*, "Council for Research in Music Education" 1985, No. 84; E.E. Gordon, *The Importance of Being Able to Audiate "Same" and "Different" for Learning Music*, "Music Education for the Handicapped" 1986, Bulletin 2; E.E. Gordon, *Preparing Young Children to Improvise at a Later Time*, "Early Childhood Connections" 1997, No. 4; E.E. Gordon, *Vectors in My Research* [in:] *The Developmental and Practical Application of Music Learning Theory*, M. Runfola, C. Crump Taggart (eds.), Chicago 2005; J.M. Feierabend, *The Effects of Specific Tonal Pattern Training on Singing and Aural Discrimination Abilities*

in the world to create a sequential programme of music education. The Theory of Music Learning explains the way in which a child learns music, taking into consideration the rule of an early didactic-educational intervention, which combines the influence of family surroundings with pre-school and school activities[7]. Gordon puts forward the opinion that possibilities of learning are at their top at the moment of birth. The sooner a child is subjected to music activities, the bigger the chances are for increasing their music aptitude potentials to a level equal to the peak occurring at the moment of birth[8].

The crucial concept is audiation described as the ability to hear and understand music, even when it is not present in the receiver's direct surroundings[9]. "Sound itself is not music. Sound becomes music only through audiation. Audiation take place when we assimilate and generalize in our minds the sound of music we have just heard performed or have heard performed sometime in the past. We also audiate when we assimilate and comprehend in our minds music that we may or may not have heard but are reading in notation or are composing or improvising"[10]. Audiation constitutes the basis of the music aptitudes and it is as important for music as thinking is important for speech[11]. Developing audiation abilities causes the development of music language, masters the process of sound perception, optimizes hearing functions, and protects against tone-deafness. It also enables a child to evaluate music and perceive its beauty in accordance with one's subjective feeling of aesthetics[12].

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of First Grade Children, Dissertation Abstract 1984, ProQuest; L.M. Levinowitz, *An Experimental Study of the Comparative Effects of Singing Songs with Words and without Words on Children in Kindergarten and First Grade*, Dissertation Abstract 1987, ProQuest; D.S. Blesedell, *A Study of the Effects of Two Types of Movement Instruction on the Rhythm Achievement and Developmental Rhythm Aptitude of Preschool Children*, Dissertation Abstract 1991, ProQuest; N.C. Cernohorsky, *A Study of the Effects of Movement Instruction Adapted from the Theories of Rudolf von Laban Upon the Rhythm Performance and Developmental Rhythm Aptitude of Elementary School Children*, Dissertation Abstract 1991, ProQuest.

[7] E. Zwolińska, *Dlaczego propagujemy teorię uczenia się muzyki E.E. Gordona?* [Why Do We Propagate E.E. Gordon's Theory of Music Learning?] [in:] Sposoby *kierowania rozwojem muzycznym dzieci w wieku przedszkolnym i wczesnoszkolnym* [Ways of Directing Music Education of Preschool Children and Elementary School Children], E. Zwolińska (ed.), Bydgoszcz 1997, p. 21.

[8] E.E. Gordon, *Sekwencje uczenia się…*, op.cit. p. 317.

[9] E.E. Gordon, *Preparatory Audiation…*, op.cit., p. 3.

[10] E.E. Gordon, *The Aural/Visual Experience of Music Literacy*, Chicago 2004, p. 1.

[11] E.E. Gordon, *Preparatory Audiation…*, op.cit., p. 3.

[12] B. Bonna, *Rodzina i przedszkole w kształtowaniu umiejętności muzycznych dzieci. Zastosowanie koncepcji Edwina E. Gordona* [Family and Kindergarten in Forming Children's Musical Skills. The Application of Edwin E. Gordon's Concept], Bydgoszcz 2005, p. 71.

While explaining the process of audiation, Gordon invokes the comparison to language learning. First, a child hears spoken words around it, and, by degrees, it starts to understand their meaning. If the speech which a child hears, is rich, then, with time, the child's communication facility with the others will be greater. The vocabulary adopted by the child becomes the basis for development of their babble speech, which in time shapes into a form of speech comprehended by the closest ones. In the next phase, having achieved a good command of speech, a child learns to read and then to write. A process analogous to that should take place during music education[13].

Audiation and activities undertaken for its development cause faster and more conscious acquisition of complex musical competences[14]. Perceptual musical skills are acquired on the basis of music comprehension. Vocal activities based on tonal patterns expand audiation and shape the ability of singing correctly in terms of intonation. Rhythm pattern recitation forms the skills connected with the sense of meter pulse and tempo changes, as well as the precise performance of songs in terms of rhythm. Facing a child with rich musical experience – singing melodies in various tonalities (major, minor, Dorian, Lydian, and others), presentation of rhythm examples in varied meter (duple, triple, unusual), as well as performing for a child and with a child's tonal patterns and rhythm patterns causes the formation of improvisation skills in terms of melody and rhythm[15].

The early interaction of the family environment and kindergarten teachers is connected with preparatory audiation. The types and stages of preparatory audiation are a temporary phase, which prepares for the entrance to the audiation. A child's ability to enter a particular type or stage of preparatory audiation indicates the child's music age, but not their calendar age. Therefore, an important postulate arises to adjust the interactions to an individual phase of each child's musical development. Depending on the level of abilities, the level which a child accomplishes during the preparatory audiation determines the way a child will manage during audiation in formal education.

Audiation is sequential, which means that each stage is the basis for, and, at the same time, a part of the next stage. Regardless of the level of music aptitude, all

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[13] E.E. Gordon, *Umuzykalnianie niemowląt i małych dzieci* [*A Music Learning Theory for Newborn and Young Children*, Chicago 1990], Kraków 1997, p. 8; B. Bonna, *Sekwencje w procesie uczenia się muzyki* [Sequences in the Process of Music Learning] [in:] *Nowe koncepcje edukacji muzycznej* [New Concepts of Music Education], A. Michalski (ed.), Bydgoszcz 2002, p. 13.

[14] See: E.E. Gordon, *Introduction to Research and the Psychology of Music*, Chicago 1998, p. 13.

[15] B. Bonna, *Sekwencje w procesie…*, op.cit., p. 13; B. Bonna, *Rodzina i przedszkole…*, op.cit., p. 71.

children pass through the same process of music learning, which means that they learn each type of audiation through sequential passing from lower to higher levels[16].

3. The application of GTML in aural training activities with pregnant women and infants

For a few years, at the Kazimierz Wielki University in Bydgoszcz there were conducted a series of aural training activities realised according to E.E. Gordon's concepts, whose purpose was developing audiation abilities in infants and small children. The activities were conducted by E.A. Zwolińska and M. Gawryłkiewicz. A group of pregnant women also participated in these meetings, allowing the researchers to observe whether their children reacted differently after birth to their mother's singing and to other people conducting the activities than other infants who were not musically stimulated in the prenatal period. It turned out that in all of the cases the babies after birth showed clear reactions to singing during the classes, seemed to listen with rapt attention, were smiling and calm, showed their satisfaction with movement, looked at the singing people and started to produce their babble music faster than other children in all of the researched cases. The mothers attending the classes also claimed that the music "remembered" by their infants from the prenatal period was calming them after birth and the mothers used it to put them to sleep. Additionally, it turned out that the unborn children showed their liking for a particular kind of music and they willingly relaxed and fell asleep when listening to it after birth. According to GTML assumptions, the children and the pregnant women were surrounded with various kinds of music during the activities, the melodies were sung in different tonalities, some rhythmic fragments were performed of a varied meter, and the tonal and rhythm patterns characteristic for preparatory audiation. All of the activities were in a form of a play and were connected with smooth, free movement[17]. It is worth underlining that

[16] B. Bonna, *Sekwencje w procesie…*, op.cit., p. 14.

[17] E. Zwolińska, *Naucz swoje dziecko audiować* [Teach Your Child to Audiate], Bydgoszcz 2004, pp. 14–15; B. Bonna, *Prawidłowości rozwoju muzycznego małego dziecka w świetle teorii Edwina E. Gordona* [Regularities of Small Child Musical Development in the Light of E.E. Gordon's Theory] [in:] *Co oferuje współczesny żłobek? Medyczne, psychologiczne i pedagogiczne aspekty rozwoju dzieci do lat trzech* [What Can a Contemporary Nursery Offer? Medical, Psychological, and Pedagogical Aspects of a Child-under-three Development], I. Laskowska, M. Wójtowicz-Dacka (eds.), Bydgoszcz 2011, p. 113.

the observations conducted during the activities contribute to the world-wide research on the reactions of foetus and infants to music[18].

4. The application of GTML in kindergarten

A year-long experimental research, based on a double-group plan with an initial and a final measurement, was carried out by Beata Bonna. 53 children at the age of 6 from two kindergartens in Bydgoszcz took part in it. The purpose of the research was, among other things, to verify the effectiveness of music teaching conducted according to Gordon's concept among the reschool children. In the course of the experiment[19] the focus was put on showing the effectiveness of the undertaken actions when it comes to development of musical, as well as perceptive, executive, and improvisation musical skills in children in natural conditions of a preschool environment. The effectiveness of the experimental method of music education (based on GTML) was compared to the traditional (Polish) conception of the children's music education. A significant purpose of the research was to

[18] See: D.J. Shelter, *The Inquiry Into Prenatal Experience: A Report of the Eastman Project 1980–1987*, "Journal of Prenatal and Perinatal Psychology and Health" 1989, No. 3; M.R. Zentner, J. Kagan, *Infant's Perception of Consonanse and Dissonanse in Music*, "Infant Behavior and Development, No. 3; G.F. Federico, *Music Aids Development in the Womb*, "Journal of Prenatal and Perinatal Psychology and Health" 2000, No. 1; G.E. Whitwell, *An Introduction to Prenatal Sound and Music*, "Journal of Prenatal and Perinatal Psychology and Health" 2000, No. 1; S.E. Trehub, *Music Lessons from Infants* [in:] *Oxford Handbook of Music Psychology*, S. Hallam, I. Cross, M. Thaut (eds.), Oxford 2009; L.J. Trainor, A. Shahin, L.E. Roberts, *Understanding the Benefits of Musical Training: Effects on Oscilatory Brain Activity*, "Annals of the New York Academy of Sciences" 2009, No. 1169; S.E. Trehub, E.E. Hannon, *Conventional Rhythms Enhance Infants' and Adults' Perception of Music*, "Cortex" 2009, No. 4; S.E. Trehub, E.E. Hannon, A. Schachner, *Perspectives on Music and Affect in the Early Years* [in:] *Handbook of Music and Emotion: Theory, Research, Application*, P.N. Juslin, J.A. Sloboda (eds.), Oxford 2010; S.E. Trehub, *In the Beginning: A Brief History of Infant Music Perception*, "Musicae Scientiae" 2010, special issue; T. Nakata, S. Trehub, *Expressive Timing and Dynamics in Infant-directed and Non-infant-directed Singing*, "Psychomusicology: Music, Mind & Brain" 2011, No. 1–2; M. Adachi, S.E. Trehub, *Musical Lives of Infants* [in:] *The Oxford Handbook of Music Education*, G. McPherson, G. Welch (eds.), New York 2012.

[19] The classes lasted 30 minutes and were conducted twice a week in both groups. The pedagogical experiment was supported with the "action research" based on an active participation of a researcher-practitioner (an expert in teaching music according to E.E. Gordon's theory), who carried out the classes in the experimental group (E). The teacher was both a researcher and a creator, the performer of pedagogical processes (see: D. Skulicz, *Badanie w działaniu* [Action Research] [in:] *Orientacje w metodologii badań pedagogicznych* [Sense of Direction in Methodology of Pedagogical Research], S. Palka (ed.), Kraków 1998). In the control group (K) the music classes with children were carried out by a teacher specializing in the traditional (Polish) conception of music education. The same musical skills were developed in both groups, however, in a different manner.

verify the possibilities of adaptation of E.E. Gordon's theory to the Polish preschool educational system, which was related to the conviction of the necessity to enrich the present methods of supporting children's musical development. It was assumed that the implementation of the basic elements of the GTML into the aural training classes at kindergartens would cause a measurable increase of the children's musical aptitudes and achievements.

The diagnosis of the children's developing musical aptitudes was made with the use of *Primary Measures of Music Audiation* (PMMA) test by E.E. Gordon[20], and the level of musical perception skills was verified with the use of the author's *Musical Skills Perception Test*. The children's executive and improvisation skills were assessed on the basis of the prepared *Set of Tasks*[21] aiming at individual sampling and the adopted measures of criteria[22].

In the course of the experiment, interactions were adjusted to the phase of musical development of a particular child, taking into consideration their music behaviour and the reactions characteristic to a particular type and stage of preparatory audiation, as well as the individual profile of music aptitudes[23].

The analysis of the research results showed an equal potential of the children's music aptitudes in the two sampled groups, both in the pre-test and the post-test. Despite the better results in the final research of the children from the experimental group, the Tonal Test, the Rhythm Test, and the total result, the difference between the groups became statistically unimportant. It was proven, however, that the increase of the arithmetic means between the initial and the final test was approximately twice as big in the group covered with the experimental method of music education (experimental: Tonal 4,43, Rhythm 4,11, Total 8,50; control: Tonal 2,30; Rhythm 2,04; Total 4,32).

Moreover, it was observed that both the experimental and the traditional classes contributed to positive changes in the aptitude level, mainly increasing the number of the sampled children with high musical abilities. Nevertheless, more advantageous changes happened in the experimental group, where a significantly bigger increase of the children with high aptitudes was noticed in comparison with the control group. In the final test in the experimental group not a single child with a low musical aptitude was found. The distribution of results showed, therefore,

[20] See: E.E. Gordon, *Introduction to Research…*, op.cit., pp. 72–75, 120–127.

[21] See: B. Bonna, *Rodzina i przedszkole…*, op.cit., pp. 221–223.

[22] See: E.E. Gordon, *Rating Scales and Their Uses for Measuring and Evaluating Achievement in Music Performance*, Chicago 2002.

[23] See: E.E. Gordon, *Umuzykalnianie niemowląt…*, op.cit.

a greater effectiveness of the teaching based on GTML in developing music aptitudes[24] (see: Table 1).

Table 1. Level of music aptitudes (number of people)

PMMA	Low				Medium				High			
	Pre-test		Post-test		Pre-test		Post-test		Pre-test		Post-test	
	E	K	E	K	E	K	E	K	E	K	E	K
Tonal	6	1	0	1	18	20	10	13	4	4	18	11
Rhythm	5	1	0	1	21	19	16	13	2	5	12	11
Total	6	1	0	0	20	21	11	12	2	3	17	13

Source: B. Bonna, *Rodzina i przedszkole…*, op.cit., p. 156.

Considering the author's *Musical Skills Perception Test,* the analysis resulted in a statistically important difference (5,25) between the average results of both groups in favour of the children from the experimental group. The manifest advantage was noted especially in the initially poor competences, which related to the recognition of song meter, long and short sounds in the rhythm patterns, as well as defining the number of sounds heard in the consonances. Moreover, the children from the experimental group achieved much better results in the tasks involving the differentiation of sound pitch in the high, moderate, and low register, as well as defining the song structure (AB; ABA).

Also the results of the individual *Set of Tasks* in the area of performance and improvisational musical achievements of children turned out to be better in the experimental group and the difference in the average number of points achieved (4,36) was statistically important.

The greatest differentiation of the results between the groups in favour of the children included in the experiment was noted in the area of the recitation of a rhythmical text with the changes of tempo, timbre, and dynamics (31%), musical improvisation (28,66%), and the improvisation of a rhythmical accompaniment to a song (23,33%). The most significant improvement in the experimental group referred to the realization of the song rhythm (an increase of 44,66%) and the tonal aspect of singing (an increase of 19,40%).

It has to be admitted that the activities undertaken in the experimental group contributed to a remarkable development of musical skills in children, especially those which were related to the tonal and rhythmical music aptitudes, developing

[24] B. Bonna, *Rodzina i przedszkole…*, op.cit., pp. 154–156.

intensely in the pre-school period. The purposefully and systematically developed auditory and singing dictionary, as well as the performance of particular tonal and rhythm patterns caused a radical development of improvisation skills in terms of melody and rhythm and the increase of intonational and rhythmical correctness of singing. It may be assumed that these activities started and strengthened the audiation process, optimizing at the same time the auditory functions, which resulted in a significant development of the children's perception skills[25].

5. The application of GTML in primary school

The purpose of the experimental research undertaken by E.A. Zwolińska was empirical verification of the hypothesis assuming the possibility of stimulating the development of audiation abilities of younger school children in the natural conditions of a school classroom. The research included 50 pupils attending a primary school in Bydgoszcz between the first and third year. Two curricula were implemented in the course of the 3-year-long research. The first one, based on GTML, was intended for the experimental group, while the other one, being the effect of the assumptions of the Polish conception of music education, was intended for the control group[26]. The research problems were connected with observation of the development of the children's tonal and rhythmical aptitudes and the skills to read melody and rhythm as a result of the undertaken experimental activities[27]. They were also connected with the observation of the impact of the applied methods (experimental and traditional) on the level of the pupils' perceptive-motor functions (visual, audible, motor skills) on the basis of measurements repeated four times[28].

E.E. Gordon's music aptitudes tests, PMMA and IMMA (*Intermediate Measures of Music Audiation*), were used in the research. The skill to read melody and rhythm was evaluated on the basis of the accepted criteria. The improvement of pupils'

[25] Ibidem, pp. 151–168.

[26] In the experimental group (E) music lessons (45 minutes a week) were conducted by a teacher of music education based on the theoretical assumptions of E.E. Gordon's conception. In the control group (K) a music curriculum was implemented by a teacher of elementary education (2 x 45 minutes a week) (E. Zwolińska *Rozwój wyobraźni muzycznej a funkcje percepcyjno-motoryczne w młodszym wieku szkolnym* [Development of Musical Imagination and Perceptive-motor Functions at the Early School Age], Bydgoszcz 1997, p. 90).

[27] The first 10 minutes of each lesson were intended for a sequential order of learning music according to E.E. Gordon's assumptions.

[28] E. Zwolińska, *Rozwój wyobraźni muzycznej…*, op.cit., pp. 87–89.

visual functions was sampled with the test by L. Bender – *Graphical Attempt of Perceptive Organisation*. M. Stambak's test – *Rhythmical Structures Reconstruction* helped to measure the level of pupils' auditory functions. Another function – pupils' motor skills was diagnosed with M. Stambak's test – *Lining Attempt*[29].

In the analysis it was claimed that the effectiveness of education connected with the development of music aptitudes of the sampled group depends on the accepted educational concept and music learning, as well as the teacher's educational experience, especially in relation to pupils achieving the poorest results (sub-group A5, see Table 2). The weakest pupils achieved much better results in the experimental group, which indicates a greater efficiency of teaching and music learning through audiation. In the experimental group there was also a greater impact of the teacher's didactic experience on the pupils' music aptitudes development. The tables below include the results of these both tests.

Table 2. PMMA test mean results for particular sub-groups[30]

Sub-groups	Tonal				Rhythm				Total			
	Measurement 1		Measurement 2		Measurement 1		Measurement 2		Measurement 1		Measurement 2	
	E	K	E	K	E	K	E	K	E	K	E	K
A1	38	38,4	38,6	38	33	33,8	35,8	34,8	70,2	69	74,4	70,4
A2	36	36,2	37	36,8	31	30	34,2	32	67	65,8	70,4	68,4
A3	35,8	33,6	36	35,4	27,8	27,6	32	30,2	63	62,2	67,4	66,6
A4	34,2	31,8	33,8	34	25,8	25,6	29,4	28,4	59,2	59	63	63,6
A5	29,2	22,4	30,4	29,8	21,8	22	26,8	23,6	53,2	45,4	58,8	54

Source: E. Zwolińska, *Rozwój wyobraźni muzycznej…*, op.cit., p. 119.

Table 3. IMMA test mean results for particular sub-groups

Sub-groups	Tonal				Rhythm				Total			
	Measurement 1		Measurement 2		Measurement 1		Measurement 2		Measurement 1		Measurement 2	
	E	K	E	K	E	K	E	K	E	K	E	K
A1	37,2	37	38	38,4	37,6	35,8	37,4	35,8	73,4	72	74,4	73,8
A2	36	36	36,8	37,6	34,6	33,4	34,6	34,4	70,4	68,6	71	71

[29] Ibidem, pp. 90–91, 169–173.

[30] Sub-group A1 included pupils with the highest results, in other sub-groups the number of points was systematically decreasing (E. Zwolińska, *Rozwój wyobraźni muzycznej…*, op.cit., p. 117).

Sub-groups	Tonal				Rhythm				Total			
	Measure-ment 1		Measure-ment 2		Measure-ment 1		Measure-ment 2		Measure-ment 1		Measure-ment 2	
	E	K	E	K	E	K	E	K	E	K	E	K
A3	35,2	35	36	36	33	32,4	33,2	32,4	67,8	67,4	69,4	68
A4	34,4	33,8	35,6	35,6	31,6	31,2	32	30,2	64,8	65,4	67,8	66
A5	32	29	32,8	31	28,2	26,4	29,8	27	63,4	56,6	63,6	59,6

Source: E. Zwolińska, *Rozwój wyobraźni muzycznej…*, op.cit., p. 126.

The author assigned the development of audiation abilities to the higher achievements of the pupils from the experimental group in terms of reading melody and rhythm[31].

In the context of the impact of the used methods of teaching on the improvement of the pupils' visual functions, the results indicated once again a statistically greater impact of the educational method and the teacher's didactic experience in the experimental group.

On the basis of the test assessing the level of the pupils' auditory functions it was indicated that the primary factor responsible for the development of these functions is the teaching method, yet proving the greater effectiveness of music education in accordance with E.E. Gordon's concept.

The research diagnosing the pupils' motor skills illustrated that in both groups the improvement was witnessed, however, in this case, better results were achieved by the control group, where an immense increase of high results was noted and a larger decrease of medium results[32].

The author notices the positive direction of changes in the development of audiation aptitudes and perceptive-motor functions in the experimental group, especially in the context of making the developmental deficits even. The integration of these functions occurring though music activity, at the same time supports achieving readiness to read and write. According to E. Zwolińska, the results proved that developing pupils' audiation aptitudes happens to be a perceptive functions

[31] E. Zwolińska, *Rozwój wyobraźni muzycznej…*, op.cit., pp. 174–180.

[32] Ibidem, pp. 143–166; see also: E. Zwolińska *Znaczenie koncepcji E.E. Gordona dla rozwoju funkcji percepcyjno-motorycznych dziecka* [Meaning of E.E. Gordon's Concept for Development of Child's Perceptive-motor Functions] [in:] *Teoria uczenia się muzyki według Edwina E. Gordona* [Theory of Music Learning According to Edwin E. Gordon], E. Zwolińska, W. Jankowski (eds.), Bydgoszcz–Warszawa 1995, p. 181.

training. She also claims that there is a probability of reducing difficulties in school education to a larger scale through shaping and developing audiation aptitudes[33].

Further experimental research among the primary school pupils was conducted by M. Kołodziejski. This research was connected with a verification of the efficiency of a sequential music education resulting from the assumptions of E.E. Gordon's conception in shaping aptitudes and perceptional musical skills, as well as vocal competences of pupils in the first year (7-year-olds) and in the fourth year (10-year-olds) from a primary school in Płock. The year-long experiment was based on a double-group plan including an experimental and a control group[34]. To diagnose the musical aptitude of the 7-year-olds the IMMA test was used, whereas the 10-year-olds were tested with E.E. Gordon's *Musical Aptitude Profile* (MAP) test. The level of pupils' skills in the first and fourth year was verified with the author's *Music Perceptive Skills Test*, while the vocal competence was verified with appropriate rating scales[35].

Tonal and rhythm patterns in their sequential layout were introduced in the first 10 minutes of music education classes in the experimental classes[36]. The experimental group consisted of 25 pupils both in the first and fourth year, whereas control group consisted of 101 pupils in the first year and 79 pupils in the fourth year. Music education lessons in the control groups were conducted according to the Polish conception of common music education[37].

The major research problem was the determination whether, and in what scale, the sequential introduction of tonal and rhythm patterns in accordance with E.E. Gordon's concept would influence the level of music aptitudes and achievements of pupils. In the analysis it was determined that the music aptitudes of the first year pupils did develop in both groups, however, though small, the differences were statistically important, as they indicated greater aptitudes in the experimental group. In the fourth year groups, where the music aptitudes due the

[33] E. Zwolińska, *Znaczenie koncepcji Edwina E. Gordona…*, op.cit., p. 181.

[34] The classes were conducted for 25 minutes twice a week in the first experimental group (E1) and for 45 minutes once a week in the fourth experimental group (E4). Lessons in these groups were carried out by a researcher – a music teacher. Music classes in the control group in the first year (K1) were realised according to the teaching timetables based on the binding core curriculum. Music lessons in the fourth year were held once a week for 45 minutes. They were realised by a music teacher (M. Kołodziejski, *Koncepcja Edwina E. Gordona w powszechnej edukacji muzycznej* [E.E. Gordon's Concept in Common Music Education], Płock 2008, p. 120).

[35] M. Kołodziejski, op.cit., pp. 117–118.

[36] See: E.E. Gordon, *Jump Right In, The Music Curriculum. Tonal Register. Book One*, Chicago 1990; E.E. Gordon, *Jump Right In. The Music Curriculum. Rhythm Register. Book One,* Chicago 1990.

[37] M. Kołodziejski, op.cit., pp. 115, 120, 123–125.

pupils' age are already fixed, no statistical differences between the groups were found. The results of both tests are presented in the tables below.

Table 4. IMMA test mean results in the first year

IMMA	Year I (IMMA)			
	Pre-test		Post-test	
	E1	K1	E1	K1
Tonal	29,8	28,87	32,2	30,87
Rhythm	26,44	26,52	29,04	28,18
Total	56,2	55,4	61,64	58,96

Source: Original research based on M. Kołodziejski, op.cit., p. 137.

Table 5. MAP test mean results in the fourth year

MAP	Year IV	
	E4	K4
Melody	22,8	24,42
Harmony	20,24	22,28
Overall result part 1	43,04	46,8
Tempo	25,72	25,27
Metre	21,28	22,35
Overall result part 2	47,00	47,62
Phrasing	18,84	15,49
Ending remarks	16,44	16,00
Style	16,08	15,09
Overall result part 3	51,36	46,62
MAP overall result	141,4	141,04

Source: Original research based on M. Kołodziejski, op.cit., p. 142.

In the case of vocal competences, the application of tonal and rhythm patterns showed the difference between the pupils from the first year (1,22 points on average) and the fourth year (2,68 points on average) for the benefit of the experimental group. Among the three selected aspects of singing: tonal, rhythmical, and technical, the rhythmical correctness of the song performance was shaped the best. The test results concerning the perceptional musical competences revealed a highly significant difference of the mean number of points (5,78) among the groups also in favour of the pupils from the first year in the research group. The skills mastered

to the greatest degree in the first year were connected with recognition of chords (major and minor), defining melody tonality (major and minor), and indentifying the tonal centre, whereas the ones mastered the worst were connected with metre and pitch. The undertaken activities also created the assumed effect in the fourth year because the difference of the arithmetic mean of the number of points (4,18) in favour of the experimental group turned out to be statistically important. The best and the weakest perceptional musical competences turned out to be similar among the pupils of the first and the fourth year[38].

The implemented experimental conduct indicated that music education resulting from the assumptions of GTML modifies the development of music aptitudes and the achievements of pupils, even though the changes referring to aptitudes are slight[39].

6. Research on instrument timbre preference

The research connected with GTML include also, however in a context different from the previous one, the research carried out by P.A. Trzos. They verify the correctness of E.E. Gordon's thesis on the existing relation of the musical instrument timbre preference with achievements in playing, who made the recognition of this area a vital element of music education. P.A. Trzos tried to answer the question on the dependency between the ascertained preferences of instrumens timbre and the musical abilities of the sampled group and the achievements in learning to play wind instruments in state-run musical schools of the first degree and institutions of after-school education (musical groups, community centres, etc.), as well as through individual and private teaching. A method of longitudinal comparative research with elements of experimental reasoning, referring to the strategy of experimental research realised according to a three-group plan with the initial and the final measurement was used in the course of the research[40]. *The Instrument Timbre Preference Test* (ITPT) and E.E. Gordon's MAP test[41], a self-monitoring check-list, an observation check-list, an interview questionnaire, and an estimation

[38] Ibidem, pp. 144–164.

[39] Ibidem, p. 216.

[40] P. Trzos, *Preferencje barwy dźwięku i zdolności muzyczne w nauce gry na instrumencie dętym. Badania edukacyjne nad adaptacją Teorii Uczenia się Muzyki E.E. Gordona* [Timbre Preferences and Music Aptitudes in Learning to Play a Wind Instrument. Educational Research on the Application of E.E. Gordon's Theory of Music Learning], Poznań–Kalisz–Konin 2009, pp. 54, 66–69, 186.

[41] See: E.E. Gordon, *Introduction to Research…*, op.cit., pp. 162–169.

scale of the assessment criteria of the level of musical pieces performance were used in the research[42]. The research including 166 pupils was conducted in several Polish provinces within the period of three years.

The analysis of results proved that only 36,7% of the tested students started to learn playing a wind instrument according to timbre preference resulting from the test. It also proved that the pupils in all three groups represented a similar level of a stabilized musical abilities (statistically important differences were not noted), which did not affect their achievements. It was also found that a wind instrument selected properly and in compliance with the preferences of timbre influences the pupil's achievements in learning to play this instrument. Additionally, the selection of an instrument according to the preferences may therefore, with a proper diagnosis of musical aptitude, raise the effectiveness of music education and increase the pupils' achievements at the same time. In the group of pupils from musical schools, where playing the instrument was taught in accordance with the preferred timbre, a definitely greater number of the sampled learners (25%) achieved significantly higher results as soon as after a year of learning compared to those taught contrary to their preferences (3%). Moreover, it was determined that the sampled pupils that have a better developed sound imagination and are made to learn to play a musical instrument contrary to their preference, show a tendency to achieve lower results in playing.

The research also revealed that the compliance of the preferences with the timbre of a wind instrument used to learn to play with the place where the process was taking place (the place of formal music education – non-formal music education institutions; private individual teaching) does shape, to some extent, the strength and the direction of the relation between the level of the stabilized musical aptitude and the achievements of pupils in the area of learning to play a musical instrument. People learning outside the formal system of education to play the instrument selected on their own and characterised by a great aptitude achieved slightly higher results than the pupils with lesser aptitude. However, in the sampled group from musical schools taught contrary to the preferences of timbre, it was observed that the higher aptitudes they had, the worse achievements in playing they presented. The proper use of a significant potential of students' aptitude continues to be a big problem of musical schools in Poland[43].

On the basis of the research results, P.A. Trzos proved that instrument timbre preference belongs to vital factors in building the students' motivation to learn to

[42] See: P. Trzos, op.cit., pp. 213–223; see also: E.E. Gordon, *Rating Scales…*, op.cit.

[43] P. Trzos, op.cit., pp. 93–101, 187–188.

play an instrument. Moreover, according to the research author's opinion, the motivation level determined by the timbre preference and connected with mastering of skills in playing does not unanimously result from the conditions of formal or non-formal music education. The research demonstrated that the dependency between the compliance of the timbre preference with the selection of instrument is not always important because of the place of teaching[44].

7. Closing remarks

The presented research, mainly experimental and of a pioneering character in Poland, point to arious contexts and areas connected with the application of Gordon's Theory of Music Learning in the Polish educational reality, confirming its high effectiveness in the process of children's musical development. However, they still constitute only a few initiatives requiring support in the form of a greater number of research confirming (or not) the results achieved thus far, as well as expanding the scope of the undertaken topics. They do not deplete the multidimensional research goal connected with proving the effectiveness of music education based on E.E. Gordon's theory in the context of longitudinal research including various age groups with particular consideration of infants and children under three. It would be appropriate to examine the phenomenon of a specific musical thinking transfer shaped on the basis of a sequential music curriculum into other areas of a child's activity.

According to J. Bruner, education cannot be treated just like a typical technical enterprise which operates on the basis of proper management of transforming information. Education should not become merely the issue of the application of 'learning theory' in the classroom or teaching focused on test achievements. It needs to be treated as a complex process of adjusting culture to the needs of its members, as well as adjusting its members and their knowledge to the needs of culture[45]. This is the context in which the presented research on the application of Gordon's concept to the system of music education in Poland should be considered.

[44] Ibidem, pp. 188–189.

[45] J. Bruner, *Kultura edukacji* [*The Culture of Education*, Harvard University Press 1996], Kraków 2006, p. 69.

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