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Effects of the 'musicogram' on children's musical perception and learning

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ABSTRACT

Learning how to listen to music is important, in order to better understand and appreciate it. Children's everyday modes of listening are often physically active (i.e. singing, dancing), whereas music teachers generally use more passive approaches. Music pedagogue Jos Wuytack has proposed a strategy for teaching non-musicians ('Active music listening with the musicogram'), which demands the listener's both physical and mental participation, before and during the listening activity. Children previously learn the musical materials through performance. They then listen while following a 'musicogram', in which musical elements and form are represented through colours, geometric figures and symbols. Empirical observation in schools suggests that this strategy enhances children's learning and

enjoyment of 'classical' music. Some studies also indicate the advantages of visual materials to enhance perception of 'classical' music in non-musically trained young people. Although music listening and perception have been extensively researched, specific strategies to teach music listening have got somewhat less attention from researchers. This study investigated the effects of the 'musicogram' upon children's perception and learning of 'classical' music. Children from Australia, Belgium and Portugal attended to a lesson taught by the same teacher, in which they listened to the 'March' from Tchaikovsky's 'Nutcracker Suite' either with or without the 'musicogram'. After, they were asked about musical characteristics of the excerpt (form, instruments, and tempo) and their enjoyment for both the music and the lesson.

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Children overall responded correctly significantly more when listening with the 'musicogram' rather than without it: these results suggest that they perceived, memorized and understood the music better. Most children also enjoyed the music more with the 'musicogram', and showed positive attitudes towards this lesson. Thus, we conclude that this visual strategy may be effective for increasing children's concentration on the music and their focus of attention on both its form and its musical elements, and thereby enhance their

enjoyment of the music. Given children's general negative attitudes towards 'classical' music, we believe this is a positive result, which may have relevant implications for music education.

INTRODUCTION

Listening to music is increasingly important for children and young people, in the fulfilment of their emotional and social needs. Due to contextual differences between school and outside school, which imply different functions of music and different repertoire, children may develop negative attitudes towards school music (Boal Palheiros & Hargreaves, 2001). Music listening has a fundamental role in children's musical learning (see Elliott, 1995; Haack, 1992; Swanwick, 1979), and its importance in schools has been recognized: the 'musical appreciation' movement of the early twentieth century emphasised the need of guided listening, and in the late 1960's and the early 1970's listening skills received much emphasis. Haack (1992) pointed out the need for well-developed listening skills in order to appreciate music effectively. Music educators have proposed theories and methodologies for school music listening (e.g. Elliott, 1995; Gordon, 1997; Swanwick, 1979; Wuytack, 1971), and music teachers are concerned with how to teach children to listen to music, in order to help them learn and appreciate it. Children seem to show particular difficulties when listening to the 'classical' repertoire of the Western tradition (further referred to as 'classical music'). This is often due to their unfamiliarity with it, but also to their difficulty to focus their attention on the complexity of the music.

'Active' versus 'passive' music listening

When listening to Western 'classical' music, either in a concert hall or at school, listeners are expected to be silent and still, whereas when listening to performances of other musical styles (rock, pop, jazz, folk, and even 'contemporary' music of the Western tradition) they are asked to participate actively (Clarke, 2005). Modes of listening do vary according to the music, the listener and the context. As Becker points out, 'what is *not* assumed in one mode (such as bodily movement in Western classical listening) may become central in another mode (such as dancing while listening to a salsa band)' (Becker, 2001:136). Children and young people listen to

music in different ways, for different purposes (e.g. change their emotional states, or develop their social relationships). They have different modes of listening in different contexts, which imply various levels of attention to and emotional involvement with music (Boal Palheiros, 2002). Research indicated that musicians and non-musicians focused on different musical elements (Madsen, 1997), and that musicians changed their attention in the course of listening (Clarke & Krumhansl, 1990). When listening to their favourite music at home and outside school children often use modes of listening to music that are physically active, such as singing or dancing along to the music (Boal Palheiros, 2002). At school, music teachers, although sometimes propose performance while listening, tend to use more passive approaches, such as questions about musical styles, or instruments, analysis and history of music. Our empirical observation of music lessons suggested that both musically trained and non-trained students seemed to listen to, understand and enjoy classical music better when active strategies were used, rather than when passive listening took place. Being active before and while listening increased students' attention to and concentration on the music (Wuytack & Boal Palheiros, 1995). By 'active' we mean intentional and focused listening, in which the listener is both physically and mentally involved, whereas 'passive' listening implies a low degree of attention and involvement that occurs, for instance, in background music and music as accompaniment of non-musical activities (Boal Palheiros, 2002).

Strategies for teaching music listening

Various strategies for helping children listen to classical music have been put into practice. Research has suggested the advantages of presenting simultaneous visual materials to enhance the perception of classical music in non-musically trained young people. Geringer *et al.* (1996) compared young people's cognitive and affective responses to musical excerpts presented in audio or audiovisual (with video) forms. They concluded that the type of visual material is important: visual information in the form of an animated story may increase attention and memory of musical characteristics more than in the form of abstract colours, shapes and movements. In fact, animated stories might well be effective in the case of programme music: an interesting example is the fragment of Walt Disney's animated film 'Fantasia' that presents

the story of 'Sorcerers' Apprentice' by P. Dukas. However, it could be also argued that in the case of non-programme music (e.g. a prelude by J.S.Bach) non-musical images that are presented simultaneously with the music, and are not related to it, may actually distract the listeners more than help their musical perception (Wuytack, 1971; Swanwick, 1979). In another study (Geringer *et al.*, 1997) the authors compared presentations of music only, music with an orchestral performance video, and music with an animation video, and found that cognitive responses were higher for the performance video. Thus, they suggested that visual information, that focuses the listener's attention to music-related aspects (e.g. instruments, performers), may help novice music listeners to increase attentiveness to the music. Another visual strategy is the listening map or map-reading, a kind of notation of the structure of a musical excerpt. Gromko & Poorman (1998) compared elementary children's ability to perceive form in classical music under one of two conditions: map-reading versus perceptual-motor performance. They suggested that merely reading the listening map may be enough for older children, but not for the younger ones; and that the performance of movement corresponding to the musical patterns does enhance children's perception of the form in art music. In fact, several studies have emphasised the importance of bodily movement whilst listening to music, as a means of enhancing musical understanding and appreciation, especially in young children (see Lewis, 1988; Shiobara, 1994). A different line of research has shown children's own visual representations of the music they listen to, including invented musical notations and non-musical images, as a means for understanding children's musical thinking and development (e.g. Bamberger, 1991; Barrett, 1997; Gromko, 1994). Some methods for music listening have proposed a kind of mixed notation indicating musical instruments and elements (e.g. dynamics), as well as non-musical images (e.g. mountains, trees, etc.), to represent both musical structures and non-musical events that are depicted in programme music (Nijse & Kok, 1962). The present study, however, is not concerned with representations of non-musical images that music may arise in listeners, but rather with precise and abstract representations of musical form, elements and materials, as a strategy for enhancing children's perception and learning of classical music. We will now present the principles underlying this strategy.

Active music listening with the 'musicogram': Wuytack's approach

Active music listening with the 'musicogram' is an approach proposed by Wuytack in the early 1970's for teaching non-musically trained children and young people to listen to classical music (Wuytack, 1971, 1975, 1984, 1989; Wuytack & Schollaert, 1972). Throughout a decade or so, he developed his approach from his own experience as a music teacher of children, young people and adults with different levels of musical training. This approach demands the listeners' participation, and it uses visual perception to enhance musical perception. Listeners who are not musically trained cannot read a music score, but they seem to understand a more general visual representation of the musical materials and the musical form.

Wuytack's approach is thus based on following principles: a) active participation of the listener, at both physical and mental levels, before the music listening activity, through the performance of musical materials; b) focus of the listener's attention on the music, during the music listening activity, and recognition of the musical materials that were previously performed; c) analysis of the musical form, through the listener's associations with a symbolic visual representation of the totality of the music. The 'active music listening' is developed in two moments: (1) introduction to the music: children first learn the musical materials through performance (singing, playing, etc.); (2) listening to the music, with the help of the 'musicogram': children listen to the music while following a 'musicogram'. As a general strategy, a concrete task is given to the students, which should be adapted to their age and musical level.

The 'musicogram'

Music unfolds in time, and it is therefore difficult to perceive it as a unit, especially in the case of long musical works. Research data suggest that, for the listener 'local structures prevail over global structures' at least in relatively short musical pieces. Listeners have difficulties in relating events that are far in time (Tillman & Bigand, 2004:218). Musical perception occurs during a certain time. Visual perception, however, takes place on a given moment: the analysis of the details of a visual art work (e.g. a painting or a sculpture) is concurrent with the perception of its totality. This advantage of visual perception is

used to help the perception of the totality of music. Clarke (2005) proposes a very interesting perceptual approach to music listening that discusses it as 'the continuous awareness of meaning, by considering musical materials in relation to perceptual capacities' (Clarke, 2005:5). This view of meaning is closely related to perception and action, and it emphasises the continuity of the perceptual process.

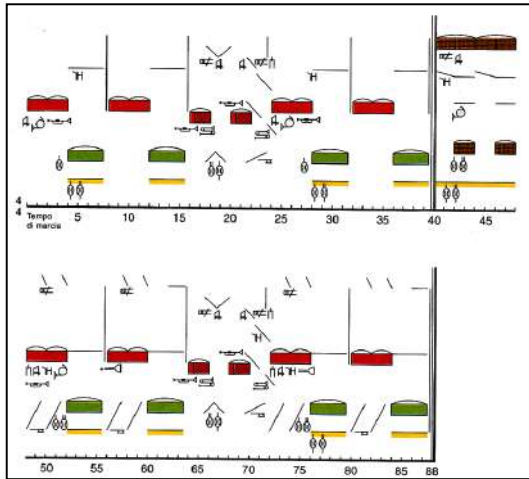


Figure 1. Musicogram of Tchaikovsky's 'March', from the 'Nutcracker Suite'

The 'musicogram' is a graphic notation of the music, a visual representation of the dynamic development of a musical work. In the 'musicogram', conventional music notation is replaced by a symbolic system that is more simple and accessible to non-musicians, and which is intended to help the perception of the total structure of a work. A fundamental principle is that the visual representation should not suggest non-musical images to the listener. On the 'musicogram', musical form and musical elements (e.g. rhythm, melody, texture, timbre, dynamics, tempo), are indicated. The musical materials that may be more easily perceived are represented through colours, geometric figures and symbols. This representation is based on general principles of perception. For example, colours indicate resemblance and contrast of the musical themes; a horizontal line represents meter, and the symbols of the instruments indicate the instrumentation.

It should be noted that the 'musicogram' is only an aid to the listening activity, which is directed at non-musically trained listeners: it does not obviously replace the music score that 'classical' musicians need, to listen to, perform and analyse music, and which teachers may also sometimes

use with non-musician students. Another point is that the 'musicogram' is directed at a specific Western musical repertoire: not every musical work is susceptible of being represented through the means of a 'musicogram'. The most suitable works are those of instrumental music, particular orchestral music, with a regular meter and a clear structure. Obviously, other musical works, genres and styles are not to be excluded from the music classroom, but they might be approached with different strategies. Having made these points, we will now present some pedagogical aspects of Wuytack's approach to music listening.

Pedagogical aspects

Learning the musical materials

Depending on the specific characteristics of the music, the introduction to the music may include verbal, vocal, instrumental or bodily expression. For instance, singing the motives and the themes; playing the rhythms or the harmonic structure; identifying the instruments and the orchestration; performing movement or dance that is related to the music; painting or drawing, to represent the musical structure. In order to facilitate the learning of the musical materials, these activities should be performed in a precise way, that is, performances should be technically correct and musically expressive.

Learning about contextual aspects of the music

Teachers' may increase children's motivation for listening to classical music by presenting them aspects that are related to the music. Knowing some biographical data about the composer motivates the young listeners and it may be relevant for understanding a particular work. In order to know a musical work well, it is important to emphasize not only its musical value, but also to situate it in the historical, political, and cultural context within which it was composed. The descriptive aspects are used for listening to programme music, which possesses a non-musical content, evokes facts, and describes certain scenes or situations. The explanation of technical aspects and the analysis of musical form and musical elements (e.g. rhythm, melody, timbre, dynamics), is also important. Finally, the interpersonal relationship between teacher and students can be crucial: the teacher's attitude of enthusiasm towards the music may definitely influence the students' motivation and their interest for it.

Listening to the music at least three times

Numerous studies have emphasised the effects of repetition and familiarity on children's responses to music, namely, to classical music (see Abeles and Chung, 1996). Nicolas (1997) defines music listening as a process 'through which the ear tries to bring out the unity of the work over time' (p. 180), and claims that 'the third hearing is the good one'. He compares music listening to the mathematical operation of integration, and proposes three modes of musical listening: spontaneous listening, perceptive listening and reflexive or introspective listening. As listening progresses cumulatively throughout these three modes, it is advisable to listen to a work at least three times, in order to grasp its unity.

Wuytack (1971) has also pointed out the importance of listening to a musical work or excerpt at least three times. After the first time, students get a general impression of the music, and are pleased to recognize its musical materials (themes, motives, etc.) that they had previously learned. The second listening allows an analytical study, though general, of the music. By following the teachers' indications (with the pulse) on the big 'musicogram', the students get aiding points for listening, and their attention is continuously focused on the music. Teachers indicate relevant details; however, they make no comments, so that the students can concentrate. During the third listening, the students follow the music by indicating its themes on their own small 'musicogram'. The aim of this individual exercise is twofold: the student's autonomy throughout the listening activity, which indicates their perception of the music; the teachers' possibility of observing the students' eventual difficulties and, what is very important, of helping them understand the music. We will now present our study, which investigated the effects of the 'musicogram' upon children's responses to classical music, by looking at their perception of the music and their enjoyment for it.

METHOD

Participants

Participants were 144 non-musically trained children aged between 9 and 12 years (mean = 9,80; Sd = 1,16), from three different countries (51 Australian, 42 Belgium and 51 Portuguese), attending primary schools in the cities of Melbourne, Brussels and Porto, respectively. There were similar numbers of girls and boys in each country (67 girls and 77 boys, in the whole sample). The sample was selected according to the

availability of children and their willingness to participate, as well as to their teachers' interest for this strategy of active music listening, which has been presented by Jos Wuytack in teacher training courses in different countries.

Design

Children attended to a music lesson, in which they listened to a recording of the 'March' from Tchaikovsky's 'Nutcracker Suite' that lasted for 2'26". Each class was randomly assigned to one of two listening conditions: A) listening with the 'musicogram'; B) listening without the 'musicogram'. The whole sample consisted of three A groups (73 out of 144 participants) and three B groups (71 participants).

Procedure

In each country children were tested in whole classes from the same school, on the same day; and they were all taught by the same teacher (the second author). Except for the use of the 'musicogram', the same strategies were employed with both classes.

1) Children first performed the musical themes rhythmically, upon a text, the content of which was related to the title of the excerpt ('March'). They performed the themes expressively (with the same tempo and dynamics of those of the orchestral performance), in the form of a dialogue between two groups (corresponding to the winds and the strings).

2) Children listened to the excerpt for the first time, while recognizing its thematic materials and its structure.

3) In condition A, after a short explanation of the musicogram by the teacher, children listened again to the music, while following the teacher's indication of the figures, colours and symbols of the instruments on the big musicogram. In condition B, children listened to the music only, after a short explanation of the thematic materials by the teacher.

4) Following a brief explanation about the excerpt, the work and the composer, children listened to the excerpt for the third time. Groups A listened to the music while indicating its characteristics on their own small musicogram, whereas groups B just listened.

After listening, standard instructions were given to the participants, in order to familiarise them with a response sheet. They completed a short questionnaire, in which they responded to: some information about the music (name of the

composer; title of both the excerpt and the work); some musical characteristics (form, instruments, orchestration, tempo); their enjoyment and feelings for the music; their enjoyment for the lesson itself.

RESULTS AND DISCUSSION

Children's responses to the closed questions (facts and musical characteristics) were previously coded into Right and Wrong categories. Their responses to the open questions (feelings for the music and enjoyment for the lesson) were later categorized and reviewed by an independent judge. All these responses were subsequently coded and assigned to each finalised category. The results were analysed for the whole sample and separately for each national group. In this paper, only the overall results will be discussed (excluding considerations regarding eventual cultural differences across nationalities): our main purpose is to focus on the effects of the musicogram, as a teaching strategy for non-musically trained listeners. In order to check for possible effects of familiarity with the excerpt, participants were also asked if they had listened to the music before. Half of them (50%) reported that they had not and one did not respond. However, children who had listened (71) and those who had not (73) were evenly distributed across the listening conditions: therefore, those effects were disregarded in the analysis.

The overall results reveal positive effects of the musicogram. Children gave significantly more correct responses to the musical characteristics when listening with the musicogram rather than when listening without it. Table 1 shows the total number of responses in each of the two categories (Right and Wrong), for the two participant groups, (with Musicogram and Without Musicogram).

Most children (75% of all responses) indicated correctly the *name of the composer* and indeed gave significantly more correct responses when listening to the music with the musicogram rather than when listening without it ($\chi^2 = 30.09$, $df = 1$, $p = 0.000$). The majority of the participants also indicated correctly the *titles of both the excerpt* (96.5%) and *the work* (91.7%). However, chi-square tests revealed no significant differences between the two listening conditions across the right and wrong categories for these two items.

As far as the musical form is concerned, most participants named correctly the *musical form* of the excerpt (73.6%) and were also able to identify

the *sequence of its parts* (91.7%), through the indication of different letters. The number of correct responses was significantly higher when listening to the music with the musicogram, both to the *form* ($\chi^2 = 42.63$, $df = 1$, $p = 0.000$) and to the *sequence of its parts* ($\chi^2 = 9.39$, $df = 1$, $p = 0.002$).

Table 1. Children's responses to the music, after listening with or without the musicogram

Questions	Response	Total	(%)	With	Without
Name of the composer	right	108	(75.0)	69	39
	wrong	36	(25.0)	4	32
Title of the excerpt	right	139	(96.5)	72	67
	wrong	5	(3.5)	1	4
Title of the work	right	132	(91.7)	69	63
	wrong	12	(8.3)	4	8
Musical form of the excerpt	right	106	(73.6)	71	35
	wrong	38	(24.4)	2	36
Sequence of its parts	right	132	(91.7)	72	60
	wrong	12	(8.3)	1	11
Instrument playing first phrase of A	right	112	(77.8)	65	47
	wrong	32	(22.2)	8	24
Instruments playing second phrase of A	right	117	(81.3)	62	55
	wrong	27	(18.8)	11	16
Two groups of instruments playing C	right	85	(59.0)	64	21
	wrong	59	(41.0)	9	50
Difference in orchestration	right	50	(34.7)	32	18
	wrong	94	(65.3)	41	53
Tempo of part C	right	33	(22.9)	24	9
	wrong	111	(77.1)	49	62

The responses to the items concerning the musical instruments show a similar tendency. The majority of the children identified correctly *one instrument playing the first phrase of part A* (77.8%) as well as *the two groups of instruments playing part C* (59.0%). Children gave significantly more correct responses to both the first ($\chi^2 = 10.87$, $df = 1$, $p = 0.001$) and the second ($\chi^2 = 50.23$, $df = 1$, $p = 0.000$) of these items when listening with the musicogram, rather than when listening without it. Most participants also identified correctly *a group of instruments playing the second phrase of part A* (81.3%), but the difference between the two listening conditions across the categories was not statistically significant.

The two questions about orchestration and tempo seemed to be quite difficult: these were the only ones to which children gave more wrong than right responses. Only about one third of the participants (34.7%) were able to identify the *main difference in the orchestration* between the parts after C and those before C, and fewer (22.9%) could identify correctly the *tempo of part*

C, as compared to that of part A. However, the number of wrong responses to both the orchestration item ($\chi^2 = 5.43$, $df = 1$, $p = 0.020$) and the tempo item ($\chi^2 = 8.32$, $df = 1$, $p = 0.004$) was significantly higher when listening without the musicogram rather than when listening with it. As far as affective responses are concerned, the majority of the participants (92.4%) reported that they liked the music. They liked it more with the musicogram rather than without it, although this difference was not statistically significant. Most participants (95.1%) also enjoyed the lesson, and indeed all of them did in the musicogram listening condition, except one child who did not respond to this question. Children across the three different countries showed quite similar reactions of enthusiasm towards this lesson and most of them said that they felt 'good' and 'happy'.

CONCLUSION

The overall results of this study are positive and may have relevant implications for music education. The overall percentage of right responses was considerably high, which may indicate children's effective learning of the music and the information taught in this lesson. The findings suggest that children perceived, memorized and understood the music better with the help of the 'musicogram', rather than without it. Thus, we may conclude that this visual strategy is effective for helping children to be continuously concentrated on the music, for a relatively long period of time. When listening to music only (without visual information) children, like adults, are likely to change their attention in the course of listening (Clarke and Krumhansl, 1990). They often do not know what to do during the music, particularly in the case of longer excerpts (Geringer *et al.*, 1997). By contrast, when listening to music with the 'musicogram', they are directed to focus their attention on both the musical form and particular musical characteristics that are indicated on the 'musicogram', during the course of listening. The visual representation of these musical characteristics (e.g. musical form, contrast or resemblance of musical themes, symbols of instruments) also helps children to focus their attention upon them, and thereby become more aware of them.

Children's perceptual awareness and learning might have enhanced their liking for the music. The difference in their enjoyment between the two listening conditions was not statistically significant, and most children actually enjoyed the

lesson as a whole, including the performance activities. Thus, we do not claim that the use of the 'musicogram' only has direct effects upon children's enjoyment for the music, but rather the strategy of 'active music listening with the musicogram' as a whole. In our study, this strategy clearly motivated the majority of children for listening to the music, keeping their interest in the course of listening, and enhancing their enjoyment throughout the lesson. Given children's general negative attitudes towards classical music, we believe this is a positive result, which may have relevant implications for music education.

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