CREATIVE MUSIC MAKING

MUSIC COMPOSITION AS SOCIAL-CULTURAL ACTIVITY IN THE ELEMENTARY CLASSROOM

MICHEL HOGENES

Creative Music Making.
Music Composition as Social-Cultural Activity in the Elementary Classroom

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To my parents for supporting me;
to Raimond for loving me; and
to my supervisors for inspiring and guiding me.

"... Not the embellishment of life, but the creative reworking of reality, a processing of things and the movements of things which will illuminate and elevate everyday experience to the level of the creative."

Vygotsky (1997, p. 261)

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THE CHILD AS COMPOSER; MUSIC COMPOSITION AS SOCIAL-CULTURAL ACTIVITY IN THE ELEMENTARY CLASSROOM

GENERAL INTRODUCTION

THE CHILD AS COMPOSER; MUSIC COMPOSITION AS SOCIAL-CULTURAL ACTIVITY IN THE ELEMENTARY CLASSROOM

1. GENERAL INTRODUCTION

This doctoral dissertation studies a number of aspects of the impact that music and music education have or may have on the functioning and development of elementary school students. The studies reported in this dissertation are the result of a process that started in 2006 with the conference: *'Harmonie in Gedrag. Over de maatschappelijke en pedagogische betekenis van muziek' [Harmony in Behavior. On the social and pedagogical significance of music],* held at The Hague University for Applied Sciences and organized by the Youth and Development research group, that resulted in a book of the same title (Diekstra & Hogenes, 2008).

During this conference, questions were raised such as: "In what way does music influence human behavior?"; "What meaning does music have for cognitive and social-emotional functioning for children and youth?"; "Under what circumstances does music have motivational effects on initiatives and performances of participants of music activities?" Music and its influence on human behavior was presented from different perspectives. Psychologists, pedagogues and musicologists as well as educators gave lectures and seminars, each from their respective discipline and experience, which sketched a picture of the current situation and scientific knowledge with regard to the relationship between music, behavior and development.

One of the outcomes of the 'Harmony in Behavior' conference was that although in a number of other countries studies have been conducted on the social and pedagogical significance of music in elementary education, research on music education in elementary school is scarce in the Netherlands. Both educators and scientists indicated that scientific research on music education in the Netherlands is necessary to improve current practices in (elementary) schools, preschools and specialized music schools. A second outcome of the conference was the awareness of music reproduction as the dominant activity in music education practices. Opportunities for students to produce music (to compose and/or improvise music) are scarcely practiced in schools, while research suggests that productive approaches can have more impact on music learning and engagement in music education than reproductive ones (see e.g. Kratus 2012; Wiggins & Espeland, 2012).

Boosted by the outcomes of the conference, the current research project 'The Child as Composer; Music Composition as Social-Cultural Activity in the Elementary Classroom' has been started. With this research project the author wants to contribute to the body of knowledge regarding the impact of music and music education on functioning and development of el-

ementary school students, with an emphasis on the impact of music composition as a classroom activity.

This introductory chapter has two purposes. Apart from providing a description of the studies in this dissertation, the questions addressed by them and a description of the methods used in answering them, it also contains a short introduction into the context of this research project, including the history of music education in The Netherlands and the theoretical and methodological framework that has guided the author in the studies on the influence of music and music education on functioning and development of elementary school students.

1.1 Problem statement and purpose of the project

Webster (2014) states that our present time might be the most exciting time in our history for music educators. Reasons for this enthusiasm are among others: a proliferation of reputable journals, a rich array of paradigms and methodologies available, access to multiple handbooks on music education and music psychology. Webster also concludes that music is playing an increasingly important role in the lives of young people. Children and youngsters spend hours and hours listening to music and watching music videos on YouTube. Both activities have shown to be an important aspect of the socialization process of youth (Barrett, 2011).

Enthusiasm regarding music education also influences ideas on benefits of music education. Strong claims on the benefits of music education, such as effects on academic achievement and social-emotional skills are made by musicians, educators and researchers (e.g. Koopman, 2005; Waller, 2007). An important question is whether these claims find support in the available scientific studies. Can they be substantiated with evidence acquired through scientific research conducted in accordance with quality criteria required in such research?

The main focus of this research project is investigating the impact of music on cognitive and social-emotional functioning of elementary school students, as well as an essential question regarding music education, namely: "What type of music education leads to increasing levels of engagement in music activities in elementary schools?"

1.2 Music in schools: historical context

The approach to music education central to the studies reported in this doctoral dissertation relies heavily on and is an extension of the central tenet towards music education as propagated by the person who is rightfully acknowledged as the founding father of music education in the Netherlands, Willem Gehrels. Therefore first of all a brief overview of Gehrels' history and work is given in the following, therewith providing the historical context of the studies in this research project.

Gehrels was born in Amsterdam in 1885. He obtained his teaching certificate at the municipal teacher education academy (de Gemeentelijke Kweekschool) in Amsterdam, 1905. During his teaching education, he was introduced to the violin, which aroused his interest in music. After

graduating, he took up a teaching post in elementary schools in Zaandam and Amsterdam. At the same time, Gehrels continued his studies to become a school principal, alongside studying Dutch language and culture. His passion for the violin and music in general was strong. Because of that he began music studies at the first private music school and conservatory 'Belinfante-Van Adelberg' in Amsterdam in violin and choral conducting. In 1919, he became the choral conductor of the National Opera in The Hague. In 1924, Gehrels went back to working in elementary schools, due to the closure of the National Opera. Music, however, remained important in his life. Foremost interested in the pedagogical aspects of music, Gehrels became a student at the 'Nutsseminarium voor Paedagogiek' of the University of Amsterdam.

In 1928, Gehrels drew up a plan to initiate a music school for all people ('een volksmuziekschool'). This initiative was inspired by his participation in the 'Musikpädagogische Informationskurs für Ausländer' [Music Educational Information Course for Foreigners] in Berlin, 1929. During this course Gehrels became familiar with the works of Fritz Jöde, Leo Kestenberg and Zoltán Kodály. This resulted in a report and thesis 'Muziek in Opvoeding en Onderwijs' ['Music in Upbringing and Education']. Its most important tenet was that children should primarily learn to experience music. Not by means of individual instrumental music lessons, but in groups, with singing as a starting point. Music education should contain a variety of music activities, including music listening, playing instruments, vocal improvisation and movement, with singing (folk) songs as the core activity.

In 1929, the Music School Foundation [de Stichting Volksmuziekschool] was established in Amsterdam. Prior to taking instrumental lessons, students (compulsory) attended general music education classes [algemeen vormend muziekonderwijs]. In these classes children learned how to sing and play recorder, and were also taught elementary music theory. The establishment of the Amsterdam Music School resulted in the establishment of similar music schools in Rotterdam, The Hague and Haarlem. After World War II, this example was followed by other cities such as Den Helder, Leeuwarden and Enschede.

Right from the start of the Amsterdam Music School, Gehrels stressed the importance of general music education as part of elementary school curricula. Therefore, he gave courses to general elementary school teachers and music specialists. In 1940, Willem Gehrels was, in addition to his positions at the Amsterdam Music School and the teacher education academy, appointed as a lecturer of pedagogy at the Amsterdam Conservatory. In 1942, his book 'Algemeen Vormend Muziekonderwijs' [General Music Education] was published. In this book, Gehrels describes how to organize music education of children in a methodical way.

From 1941, Gehrels organized courses and conferences in which musicians and elementary school teachers were able to obtain the Gehrels Certificate [het Getuigschrift-Gehrels]. In 1946, the Gehrels Association [de Gehrels Vereniging (now: Gehrels Muziekeducatie)] was founded during the fourth summer course for musicians and teachers.

Today, the Gehrels Association [Gehrels Muziekeducatie] has over 1600 members, publishes a journal 'De Pyramide' as well as books and CDs, organizes professional development courses and maintains the website www.gehrelsonline.nl. In 1968, at the age of 83, Gehrels became Doctor Honoris Causa at the University of Amsterdam for his merits as music educator. Dr.

Willem Gehrels died in 1971 (Doornekamp & van Olphen, 1996; van Gurp, 2012).

In line with Gehrels' ideas on music education, music in school curricula today consists of more than just singing along. Influenced by music educators such as Orff, Kodály and Dalcroze, but also by musicologists like Blacking and Elliot, music education has evolved into a broad subject area (Campbell, 2007). Although in most schools singing remains the core activity with regard to music education, a significant amount of attention is also paid to playing instruments, music listening, music and movement, and musical notation. All these 'domains', or forms of music behavior, are part of balanced music curricula of elementary schools (van der Lei, Haverkort & Noordam, 2010).

Although there has been critique on music education in general, regarding issues such as the use of "pedagogical music" instead of "real music" (e.g. Boehmer, 1974; see also Haanstra, 2001), and on the Gehrels' approach in particular (Boehmer, 1974; Hageman, 1995), elements and tenets of this approach are still clearly visible in several contemporary music teaching methods in the Netherlands[1].

In his book 'Algemeen Vormend Muziekonderwijs' [General Music Education], Gehrels (1942) describes improvisation as a key element of music education, which he conceives of as self-inventing melodies. Gehrels (1942, p.53) regards improvisation as a form of play: *"The improvisation is entirely regarded as play in this case. [De improvisatie wordt hier geheel als spel beschouwd]"*. According to Gehrels, it offers children opportunities to express themselves and contributes to the development of inner hearing and memory. However, in years to follow Gehrels' beliefs about improvisation became the subject of criticism. The 'free improvisation' was more often than not guided along previously marked paths. Instead of a musical exploratory journey, Gehrels' improvisation would be too focused on easily achievable, minor successes (Leenders & de Jong, 1995).

Being aware of critiques on the works of Willem Gehrels, the author of this research project is nevertheless still impressed by the influence of Gehrels' work on today's music education in the Netherlands, as well as by Gehrels' awareness of the importance of music improvisation for musical development of children, which was new to Dutch music education in the 1940s. Nowadays, music improvisation is often used as a starting point for music composition. This means that Gehrels' approach to music education can be considered the first step toward today's music education in which elementary school students can be playfully encouraged to create their own music, in other words: to compose music and to be viewed as young composers. The child as composer is an aspect of music education and its influence on child development is a central issue in this doctoral dissertation.

1.3 Theoretical framework

[1] Contemporary teaching methods for music education in the Netherlands are among others: 'Moet je Doen', 'Vier muziek met!' and 'Muziek en meer'. See www.moetjedoen.nu, www.viermuziekmet.nl, and www.lambo.nl/category/uitgaven/muziek/muziek-en-meer.

1.3.1 Developmental Education

A wide variety of educational concepts for elementary and secondary education can be found in the Netherlands, such as Jenaplan, Steiner, Montessori and Dalton (see Onderwijsinspectie, 2014). The educational concept of a school determines the expectations teachers have of students, teachers' ways of interacting with students, and teachers' concepts of development and learning. Hence, it determines the way school subjects are taught as well. This is also the case for music as a school subject.

One of the contemporary educational concepts in the Netherlands is Developmental Education (Janssen-Vos, 2008; Van Oers, 2012; Pompert, 2008)[2]. Developmental Education has been chosen as educational concept for this research project because the author wanted to study music composition as a regular classroom activity in elementary schools within an educational framework in which music composition can be analyzed as and at an activity level. The Cultural-Historical Activity Theory, which underlies Developmental Education, provides such a framework with engagement in activities as a key characteristic. What is of special interest to the current research project: are students able to participate in music composition activities, and do they want to participate in these activities?

Developmental Education ['Ontwikkelingsgericht Onderwijs'] is an educational concept based on Vygotsky's Cultural-Historical Theory of human development and learning. Vygotsky's approach was later completed by Leont'ev (1981) who developed a psychological theory of human activity. This led to an approach that is nowadays known as Cultural-Historical Activity Theory (CHAT).

The mission of Developmental Education is development of a theoretically well-grounded practice for the education of children that would be inherently pedagogical, in other words an approach that aims to deliberately promote the cultural development of children, acknowledging the responsibilities and normative choices that educators have to make (and want to make) in helping children to become broadly-developed autonomous and critical agents in society (Van Oers, 2012, p.13).

Over 240 of the 6549 Dutch elementary schools work with the Developmental Education concept, or employ some of its features to improve their educational practices (OGO-Academie, 2014; CBS, 2015). These schools apparently see the potential of this concept for transcending the dilemma between child-centered and strictly method-centered approaches (Fijma & Wardekker, 2009). Despite the fact that more empirical evidence is needed, teachers and other educators derived their methods from the assumption that students develop as persons, because they not only work on improving their skills and gaining knowledge, but also develop socially and emotionally – students are responsible for and admit responsibility for their own actions. Education becomes socially relevant in such a way that students feel engaged in their community, and with a positive yet critical attitude want to actively contribute to social practices.

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[2] The author of this chapter is chairman of the Academie voor Ontwikkelingsgericht Onderwijs [the Academy for Developmental Education] in the Netherlands. He has extensively worked on and studied possibilities to teach music based on the Developmental Education approach.

Characteristics of Developmental Education, described by Van Oers (2003) are: (1) Developmental Education is a holistic approach. Affective and (meta-) cognitive aspects of broad development of children's identity are connected with specific skills and knowledge. What is characteristic of holistic approaches is that the whole is considered to be more than the sum of its parts. Hence, the student's identity cannot be built by teaching skills, abilities and knowledge separately. (2) Education is based on meaningful activities and learning embedded in the context of sociocultural practices. In thematically arranged social-cultural activities, students influence the choice and planning of activities they are involved in. The educational arrangements for young children are constructed as playful activities, while activities for older children are arranged as activities of inquiry-based learning aimed at finding answers to their personal questions. (3) The teacher is a participant in the joint activities. He or she can play or carry out a research project together with children. The adult is a more knowledgeable partner for children in this process of learning. (4) Students construct instruments that are solutions to problems meaningful to them. While performing the activities, students encounter problems that encourage them to find solutions to these problems. In the search process, they form – together with the help of others – new operational structures. (5) A systematic hypothetical pathway is developed; it is systematic in the sense that there is a theme linking the activities that students can recognize, and that these activities are subject to intrinsic coherence. The teacher knows what learning objectives he or she wants to achieve and has a schedule for a set period of time (see also Van Oers, 2012). This pathway is solely hypothetical, as it is likely to be adjusted where necessary while working with the students.

One may expect that teaching and learning music in a developmental context should be different from teaching and learning music in schools that work with cultural transmission approaches that emphasize skills acquisition rather than integral identity development. Although several Developmental Education practices have been described for language acquisition, mathematics and so-called world orientation sciences (geography, history and biology), few practices have been described with regard to music education. De Jong & Van der Heijden (2005) were the first to contribute to practical thinking of music within the concept of Developmental Education by writing a book *Gevangen in een schelp. Ontwikkelingsgericht muziekonderwijs in de onderbouw [Captured in a sea shell. Developmental music education in the lower grades]*. In 2008, Nieuwmeijer added a valuable contribution by publishing *Het prentenboek als invalshoek. Werken met prentenboeken in het basisonderwijs [The picture book as a starting point. Working with picture books in elementary education],* which includes music education. Both books focus on the lower grades of elementary education. An important question is how to follow up on this in the upper grades of elementary (Developmental Education) schools.

1.3.2 Toward developmental music education

The main goals of Dutch elementary education are defined as 'attainment targets' [kerndoelen]. The Dutch House of Parliament has approved these attainment targets. For education in the arts domain there are three official main goals, the attainment targets 54, 55 and 56. Developmental Education schools have to achieve the same goals (Greven & Letschert, 2006).

- Attainment target 54: Students learn to use visuals, music, language, play and movement to express and communicate feelings and experiences.

- Attainment target 55: Students learn to reflect on their own works and those of others.
- Attainment target 56: Students acquire some knowledge about, and learn to appreciate, aspects of cultural heritage.

Schools are free to develop their own curricula designed to achieve these goals. Looking at music education in Dutch elementary schools, it is evident that in the context of schools music is mostly re-produced, while in the other arts subjects, like visual art, dance, drama and literature, creation or production plays a much more important role. Music improvisation activities as described by Gehrels (1942), or music composition carried out by children themselves are not among common classroom activities in most elementary school practices, as many classroom teachers do not feel competent enough to teach music, let alone teach music composition (Kors & Van de Veerdonk, 2006; Mills, 2009). Taking into account the characteristics of Developmental Education, music composition can be conceived of as a cultural practice that could be key to developmental music education in the upper grades of elementary education.

Using the key characteristics of Developmental Education as described above (see: 1.3.1), music composition can be elaborated on as a holistic activity (characteristic (1) of Developmental Education). Apart from specific skills and knowledge, aspects of broad development, such as 'inquiry, reasoning and problem solving' and 'expressing and shaping' are needed to compose music. (2) Music composition can be encouraged in the classroom as a meaningful activity for elementary school students. As such, it might increase motivation for music education as students experience ownership of their music compositions. (3) In order to revise (improve) a music composition, the student has to work together with a more experienced composer. This composer can be their teacher, a more knowledgeable partner for students in the process of learning. (4) In the process of music composition students will face various musical problems. Through the musical activities they learn to solve these problems using certain "craft" skills, but also creativity/musical imagination. (5) The (music) teacher develops a systematic hypothetical pathway. Learning objectives that have to be achieved are formulated for a set period of time. The learning pathway toward these objectives is not to be followed in a strict mandatory way, but can be adjusted while working with students, according to their needs.

1.4 Main concepts of the Cultural-Historical Activity Theory

Developmental Education and more specifically developmental music education, as described above, is based on the Cultural-Historical Activity Theory (CHAT) of human development and learning. For the description of education derived from Cultural-Historical Activity Theory four main concepts have proved to be useful to this project: 1) meaningful learning, 2) zone of proximal development, 3) involvement, and 4) play (Van Oers, 2012).

1.4.1 Meaningful learning

From a Vygotskian/Cultural-Historical Activity Theory perspective, meaningful learning is

fundamental for learning that promotes broad cultural development and agency (Van Oers, 2012). Learning will only be meaningful when the learning outcomes are compatible with cultural meanings available to students and make sense to them. Such type of learning is expected to contribute to students' action potential. In other words: 1) Meaningful learning focuses on the appropriation of cultural meanings. The results (learning outcomes) of the meaningful learning have an exchange value in the community (knowledge, skills and attitudes that are of societal significance). 2) However, it also relates to the learner's own value system (motives, interests and convictions) and is permeated with the students' own personal meaning, which adds personal value to the appropriated cultural meanings (John-Steiner & Mahn, 1996; Van der Veer, 1996).

What is essential in cultural-historical thinking about development-promoting learning is the assignment of personal meanings (i.e. sense) to the process of cultural transactions. Leont'ev (1978) argued that without sense, human actions and learning may lead to alienation of pupils from learning and the educational process. They can be an obstacle in developing responsible agency. According to Menčinskaja (1989/1968), as quoted by Van Oers (2012), Developmental Education essentially should recognize the subjectivity of students and as such it should take into account students' interests and personal characteristics.

This dual conception of meaningfulness in learning is a key to Developmental Education. Van Oers (2012) states that educators should recognize students as individual subjects who bring their own voices and histories into the process of participation and learning. However, as Leont'ev (1978, 1981) made clear, sense cannot be taught by the means of direct instruction. It can only be formed through interaction between a person and his or her social environment. Development of sense can be formed on the basis of student experiences and personal valorizations. In Developmental Education, development of sense in the acquisition of cultural meanings begins with participation in cultural practices that make sense to students.

1.4.2 Zone of proximal development

The zone of proximal development is generally seen as the core of Vygotsky's view on learning and development (Chaiklin, 2003). Learning that promotes development should be ahead of children's actual level of performance (Vygotsky, 1978, p. 89). Educators should deliberately incorporate new tools and ways of acting into children's activities and help in appropriating them. However, the definition of the zone of proximal development that is most quoted refers solely to the "*discrepancy between what the child can do independently and what he can do with appropriate help from adults and more knowledgeable peers*" (Vygotsky, 1978, p. 89). This is a perilous definition as it also may allow the interpretation of teaching as direct instruction, regardless of the sense that learning itself has for children. A problem with this interpretation of the zone of proximal development is that it misrepresents Vygotsky's idea about developmental learning. Learning essentially *needs* to make sense for children. For Vygotsky, the zone of proximal development is inherently related to imitation (see Vygotsky, 1982, p. 250), and imitative participation in cultural practices (Van Oers, 2012, p. 22). As a consequence, the promotion of children's development should be contextualized in cultural practices in which children – given their orientation to reality – want to participate and are able to do so at their actual level of development and in accordance with their personal interpretations of that practice. Through such participation,

children continue to develop (with the help of others) and new action potential is formed in accordance with children's needs that have emerged from these cultural practices. Within the frame of imitative participation in cultural practices, zones of proximal development can be constructed in interactions between children and adults, that become valuable contexts for developmental learning, as long as the child receives the appropriate help (Van Oers, 2012, pp. 21-22).

1.4.3 Involvement/engagement

The emotional relationship actors establish in particular situations is an important dimension of social situations of development. This relationship refers to the extent to which a person feels engaged in the cultural activity in which he or she is taking part. An important precondition is that a person feels accepted in this activity and is able to play his or her part in a personally meaningful way. Vygotsky referred to this emotional involvement in the situation as *pereživanie*; it is hard to find an English equivalent for it (Van Oers, 2012, p. 22). *Pereživanie* refers to experiencing an activity so intensely, that one becomes fully immersed in it. It therefore refers to a state of an authentic and emotional engagement that serves as a personal prism to evaluate an activity setting in an authentic way. According to Vygotsky, engagement is an important dimension for constituting meaningful and functional social situations for cultural development. From an activity-theory point of view, engagement can occur when an actor takes a role in an activity he or she feels emotionally related to, a role that is supported by a personal imagination of what it means to act out this role.

It is interesting to see that a contemporary of Vygotsky, stage director Stanislavsky, used the same notion of *pereživanie* (see e.g. Stanislavsky, 1989). Stanislavsky's use of this concept could be helpful in understanding its relevance for education. As a stage director, Stanislavsky tried to avoid mechanical enactments of a role in an actor's approach to mastering a role for a stage play. Instead, he encouraged actors to profoundly live "into" the role so that the part can be played as if an actor is momentarily *being* the character that features in the scene, and not just *pretending* to be it.

Involvement in an activity or role is an essential element of Developmental Education. Only through such involvement in cultural practices are actors able to learn to become agents in the activity. In other words: actors become engaged in learning processes that potentially promote broad development. In Developmental Education schools and teachers get children involved in cultural practices that make sense to them and encourage children from an early age to take a role in cultural practices and act out this role in a personally meaningful way.

1.4.4 Play

Drawing on the concepts of meaningful learning, the zone of proximal development and involvement described above, Van Oers (2012) developed a new conception of play on the basis of the Activity Theory. This conception rejects the idea of play as a distinct phenomenon *sui generis*, apart from other types of human enterprises like work or learning. Van Oers (2012) argues that play refers to the way an activity is carried out, i.e. to the format of cultural activities (practices). Formats of an activity can be characterized by three main parameters: the *rules* that constitute the activity, the level of *involvement* to which children are engaged in the activity, and the *degree of freedom* that the cultural community allows

the player.

Developmental Education is characterized as an approach that advocates a play-based curriculum for young children (Janssen-Vos, 2008; Van Oers, 2003, 2012). However, play is not a phenomenon exclusively meant for young children alone. Activities for older children can also be carried out in playful ways and become meaningful in a format in which they do not follow strict rules. The idea of play as an activity that promotes learning and development is also consistent with Vygotsky (1978, p. 103) and El'konin (1972). This means that meaningful learning should be embedded in meaningful practices (practices that make both cultural and personal sense) that follow a play format, in which: 1) the cultural status of an activity, especially the rules that constitute it, are taken seriously and are maintained, if necessary, through educational support systems (help/scaffolding). Such support systems facilitate the performance of the activity without simplifying it; 2) students and their teachers take up roles that make sense to them and participate voluntarily (to an extent that is both culturally and ethically as well as systematically permitted), with authentic involvement, and in personally meaningful ways; 3) the teacher encourages students to develop their ability to participate in that practice as self-dependent, critical, and responsible agents by deliberately encouraging students to appropriate the tools and rules that go with the impersonated role. In this process, students have a degree of freedom to explore and experiment with the tools and meanings (Van Oers, 2012). Teachers monitor this process continuously and take advantage of meaningful teaching opportunities in the context of play. These are considered to be fundamental professional abilities of teachers in a play-based curriculum.

Last but not least, an important and distinctive characteristic of Developmental Education is that a play-based curriculum is *not* just a curriculum that allows children to play in spare moments in addition to learning and work. Playfulness is an essential characteristic of all children's activities in the play-based curriculum of Developmental Education. Opportunities for teaching are embedded in these activities at moments that make sense for the students. A play-based curriculum is not to be conceived of as a curriculum that allows children to play now and then, but as a curriculum in which playfully formatted cultural practices, such as music composition, invariably become contexts for meaningful learning (Van Oers, 2012).

1.5 Research questions and research design

In this doctoral dissertation, five studies are presented in chapters 2 to 6 respectively. The research project as a whole has three major focal points: 1) Can claims with regards to effects of music and music education be substantiated with evidence, acquired through scientific research? 2) How can music education be formatted in line with the Cultural-Historical Activity Theory? And 3) What are the effects of music composition as classroom activity on engagement in music education and academic and musical achievement? The chapters are written as independent articles; as a consequence, there is some overlap between them.

To sum up, the following general research questions are addressed in this doctoral disserta-

tion:

1. What are the effects of music education on social, emotional, cognitive and motor functioning? This question is addressed by a review study (Chapter 2).
2. How can musical activities for children be conceptualized as playful activities that establish optimal conditions for (musical) learning outcomes? This question is particularly addressed in chapters 3 and 4.
3. What are the effects of music composition as a classroom activity on engagement in music education and academic and musical achievement? This question is addressed in chapters 5 and 6.

For this doctoral dissertation, a broad approach has been chosen, including both theoretical and empirical studies. As for the empirical part, a mixed method approach (Creswell, 2009) is used. Both qualitative and quantitative data have been collected in response to the general research questions described above, and the specific research questions described below. Both qualitative (study 5: 'Noa, a 10-year-old composer') and quantitative data (study 1: 'The impact of music on child functioning', 4: 'The effects of music composition as a classroom activity', and 5: 'Noa, a 10-year-old composer') have been analyzed following pervasive and rigorous procedures for the qualitative and quantitative methods (Teddlie & Tashakkori, 2010). Data have been triangulated to study the child as composer. Studies 2 and 3 are theoretical studies on music play and music composition to construct a theoretical frame for the empirical studies in chapters 4 and 5.

1.5.1 Study 1: The impact of music on child functioning

Educational scientists have addressed the question of what effects music education can have on child development from a research point of view. Some researchers claimed to have found effects on cognitive development, such as the increase of the ability to concentrate and improved academic achievement. Effects in the social and emotional domain, such as an increase of social skills and emotional intelligence, have also been reported (Bastian, 2002; Elliott, 1995; Gardner, 2004).

The research question of narrative literature review was as follows:

1. What are the empirically demonstrated effects of music education on social, emotional, cognitive and motor functioning of children?

1.5.2 Study 2: Playing music. A perspective on music education using Cultural-Historical Activity Theory of Learning and Development

The second study in this doctoral dissertation reflected on possibilities for a play-based music curriculum from a theoretical point of view. Many school subjects have been innovated by making the step from a reproductive approach to a more productive one, in which young children are actively involved in the construction of objects that are relevant to their respective disciplines. Although many music teachers have taken measures towards productive music engagement in music education over the past decade, there is still much to do to truly innovate music teaching in elementary education. Although music educators commonly recognize the importance of making music enjoyable, music education pedagogy for children still relies heavily on learning to sing songs selected by the teacher and structured toward specific behavioral outcomes (Niland, 2009). Based on what is known about play as a phenomenon in

young children's everyday life and the research that has been done into play, we will argue in this article that play and music education can be combined to answer the need for productive music education.

The main research question formulated in accordance with the research purpose was:
1. How can musical activities for children be conceptualized as playful activities that establish optimum conditions for (musical) learning outcomes?

1.5.3 Study 3: Music composition in the music curriculum

In this study, the notion was studied in more depth by focusing on the roles children are likely to adopt in playful music education,. In particular, the possibilities of conceiving of children as young composers were explored. When looking closely at the domain of music making, it becomes evident that in the context of schools, music is mostly reproduced, while in the other arts subjects, such as visual art, dance, drama or literature, creation or production plays a much more an important role. Music composition carried out by children themselves is not a regular classroom activity in most music education practices in elementary schools. Classroom observations have shown that students like to sing songs written by songwriters and equally like to play pieces written by composers (Hogenes, 2010). They enthusiastically perform music and are interested in the music that is offered to them. But why not introduce music composition as a classroom activity and regard children as young composers, as suggested in the chapter on playing music?

In this study, different theoretical fields, such as music education and educational psychology, are brought together in order to develop an approach to music education that concentrates on 'composing' as a core activity, and that is relevant for elementary school teachers.

The main research questions and sub-questions read as follows:
1. What are core-characteristics of music composition?
2. How can elementary school students be meaningfully engaged in music composition activities?
3. To what extent does music composition require the mastery of music notation and creativity?
4. What are the pedagogical implications of music composition as a regular classroom activity?

1.5.4 Study 4: The effects of music composition as a classroom activity on engagement in music education and academic and music achievement. A quasi-experimental study

The fourth study brought the outcomes of the previous chapters together in a quasi-experimental study (experimental-control group between-subjects design; total $N = 131$). The chapter aimed to contribute to the understanding of the effects of music education, in particular music composition as a classroom activity for nine- and ten-year-olds (fifth- and sixth-graders in the Dutch school system). The intervention (experimental condition) focused on the three-step-model for music composition, based on the Cultural-Historical Activity Theory (CHAT) of learning and development, and has been compared with a teacher-centered approach based mainly on students' reproduction of music (control condition).
The study addressed the following research questions.

1. What differences exist between the effects of a music education intervention based on music composition as a classroom activity and a music education intervention based on a teacher-centered approach mainly comprising reproduction of music on students' *engagement* in music education?
2. What differences exist between the effects of a music education intervention based on music composition as a classroom activity versus a music education intervention based on a teacher-centered approach mainly comprising reproduction of music on *intelligence, academic achievement, and musical achievement*?

1.5.5 Study 5: Noa, a 10-year-old composer. A case study

The previous empirical studies were conducted in classroom situations. In order to get a better understanding of the revision phase, a case study was conducted in a single-subject design that offered the possibility to study this part of the music composition process more closely than what is possible in a classroom. This case study focused on the effects of a closely guided music composition activity, in which extra attention is paid to the revision/improvement of music compositions, on engagement in music education and musical achievement in a single-subject situation.

The main research question of this study was:

1. What are the effects of a closely guided music composition activity performed by a 10-year-old, in which particular emphasis is placed on the revision of the compositions, on engagement in music education and musical achievement in a single-subject situation?

1.6 Overview of the doctoral dissertation

As outlined before: this doctoral dissertation contains five studies that are presented in chapters 2 to 6 respectively. The chapters are written as independent articles; as a consequence, there is some overlap between them. Four of the five articles have been published in international peer-reviewed journals. Chapter 7 ties together the findings and conclusions of the separate studies in this doctoral dissertation for a comprehensive reflection. This chapter opens with a repetition of the research questions. In the sections that follow, these questions are addressed by providing a chronological summary of the findings of each study. Finally, some remarks on educational theory and practice are made, as well as proposals for further research. The musical ability test with regard to singing and listening as well as the engagement test used for studies 4 and 5 have been added as appendices. These tests have been constructed by the researchers. They have not been published. ■

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THE IMPACT OF MUSIC ON CHILD FUNCTIONING

Abstract

This article provides a review of empirical studies on the effects of music education on cognitive, social-emotional, and motor functioning of children. Twenty-one studies published in peer-reviewed journals in the period 1995 – 2011 that met the inclusion criteria were identified. Eighteen of these studies focused on cognitive functioning. All of them, with three exceptions, reported positive or moderate positive effects. All reviewed studies on social-emotional and motor functioning showed positive effects of music education. The authors conclude that exposure to music and music education can have a positive influence on child functioning. However, given the diversity in research design among the different studies the jury on how robust these effects are and how they can be explained is still out. (Quasi-)experimental studies need to be conducted, compliant with standards for scientific research. Only then, undeserved claims can be refuted and the surplus value of music education can be demonstrated.

Hogenes, M., Van Oers, B., & Diekstra, R.F.W. (2014). The impact of music on child functioning. *The European Journal of Social & Behavioural Sciences,* 1507-1526.

2. THE IMPACT OF MUSIC ON CHILD FUNCTIONING

2.1 Introduction

For a long time, music educators have suggested that music, either in the form of music education, music practice, or exposure to music, can have a significant impact on school achievement, school attendance rates and students' conduct, both in elementary and secondary education (Koopman, 2005; Waller, 2007).

Educational scientists have addressed the question of what effects music education can have on child development from a research point of view. Some researchers claim to have found effects on cognitive growth, such as the increase of the ability to concentrate and academic achievement. Also effects in the social and emotional domain have been reported (Bastian, 2002; Elliott, 1995; Gardner, 2004). From a large-scale longitudinal study Bastian (2002) arrived at the conclusion to have identified a significant improvement of social competencies, an increase of motivation to learn, a significant improvement of IQ, and the ability to concentrate as a result of enhanced music education, consisting of playing Orff-instruments, recorder lessons, lessons on other musical instruments, and special music projects.

Understandably, musicians and music educators point at studies like these to underpin the importance of music education. The leading organization in the United States of America, The National Association for Music Education (NAfME, before MENC), goes even further by putting on its website under *'Facts and Figures'* the *'The Benefits of the Study of Music' "The* study of music helps to achieve: success in society; success in school and learning; success in developing intelligence; success in life." Claims like these are supported with statements of opinion leaders, among them president John F. Kennedy, who said in 1962: "The life of the arts, far from being an interruption, a distraction, in life of the nation, is close to the center of a nation's purpose – and is a test to the quality of a nation's civilization" (MENC, 2009).

2.1.1 Previous review studies

Waterhouse (2006) wrote a critical review on multiple intelligence, the Mozart effect, and emotional intelligence. As to the Mozart effect, that is to say the effect of music exposure on intelligence, the available evidence did not support the belief that the Mozart effect is a mechanism that can improve spatial skills without practice or emotional arousal. The evidence disconfirming the Mozart effect suggested that there is no effect at all. The evidence confirming the Mozart effect, however, suggested that certain compositions of Mozart may be a pleasant means of inducing emotional arousal and may thus provide a brief improvement in spatial-temporal skills precisely because it induces such arousal. Waterhouse (2006) also argued that it may be that cortical arousal stimulated by music can prime cortical circuits for spatial processing where the circuits for music and spatial processing overlap. In sum she concluded: "The evidence to date does not justify advocating music as means to improve spatial skills 'for free.' The Mozart effect theory should not be

taught without consideration of the disconfirming evidence or without consideration of the possibilities of the mechanisms that may underpin the Mozart effect (Waterhouse, 2006, p. 216)."

Eady and Wilson (2004) studied the effects of music education and concluded in their literature review of the influence of music appreciation and music performance on students' learning performance, that several studies and observations show a possibly positive impact of music on both academic achievement and study skills. Eady and Wilson emphasized popular music and music technology. Various studies and observations indicated that music can influence learning in core subjects (such as language and mathematics) as well as contribute to the attainment of core goals of learning.

Hallam (2010) concluded in her review on the power of music education that positive effects of active engagement with music on personal and social development only occur if it is an enjoyable and rewarding experience. According to this author, this would have implications for the quality and methodology of teaching music: *"In early childhood there seem to be benefits for the development of perceptual skills which affect language learning and which subsequently impact on literacy. Opportunities to be able to co- ordinate rhythmically also seem important for the acquisition of literacy skills. Fine motor co-ordination is also improved through learning to play an instrument. Music also seems to improve spatial reasoning, one aspect of general intelligence, which is related to some of the skills required in mathematics. While general attainment is clearly affected by literacy and numeracy skills, motivation, which depends on self-esteem, self-efficacy and aspirations, is also important in the amount of effort given to studying. Engagement with music can enhance self-perceptions, but only if it provides positive learning experiences which are rewarding."* (Hallam, 2010, p. 281/282).

In many studies on exposure to music, music therapy and music education, cognitive development is operationalized in terms of school academic achievement (Slijper, 1998; Waller, 2007). Research has been done to the effects of music therapy in residential settings and special education. In a meta-analysis in which 12 studies had been used to investigate the influence of music therapy interventions on academic achievement Slijper (1998) reported about 1606 subjects in total with a mean age of around 11 years old. A total of 794 subjects attended a form of music therapy, while the control group existed of 812 subjects. The main research question was: "Can music help to increase one's academic performance, and if so, is there a dose-response relationship?" The analysis of this study shows that music therapy had a small but significant effect on academic achievement. The interventions in the reviewed studies were similar to the ones that are used in regular educational settings (Kodály (Houlahan & Tacka, 2008), arts enriched programs, using back ground music, et cetera), while the control groups got no treatment at all, or were offered a non-music program. Because of the nature of these interventions it is likely to assume that the positive outcome of this study would be similar in regular educational settings.

Gold, Voracek & Wigram (2004) performed a meta-analysis on the size of effects of music therapy for children and adolescents with a wide range of psychopathology (developmental delay, disorders in psychological development, emotional disturbance, et cetera). They

examined how the size of the effect of music therapy had been influenced by the type of pathology, client's age, music therapy approach, and type of outcome. In this meta-analysis 11 studies were incorporated with a total of 188 subjects. The effect sizes were combined with weighting for sample-size, and their distribution was studied. After exclusion of an extreme positive outlying value, the analysis revealed that music therapy had a medium to large positive effect (ES .61) on clinically relevant outcomes, that was statistically highly significant ($p < .001$) and statistically homogeneous. The authors found no evidence of publication bias. Effects tended to be greater for behavioral and developmental disorders than for emotional disorders; greater for eclectic, psychodynamic, and humanistic approaches than for behavioral models; and greater for behavioral and developmental outcomes than for social skills and self-concept. However, considering the specific pathological conditions in these studies, it is questionable if these highly positive effects of music therapy interventions for children with a psychopathology may be translated to regular educational situations.

Based on the two literature reviews and two meta-analyses discussed above we may conclude that music education, music therapy and exposure to music can have a positive effect on child functioning. However, the studies analyzed in these review still seem limited in their scope and subjects, and were undetermined as to the content of the musical interventions. Although the reviews above may be taken as suggesting a possible relationship between music and performance, it is still unclear whether this relationship can be maintained for regular education in families and schools in general. Moreover, a number of reviews also report negative results with regard to the influence of music on human functioning (Jones & Zigler, 2002; Waterhouse, 2006).

2.2 Problem Statement

Music education and exposure to music by listening or active music making would make children smarter and would have a positive influence on children's social- emotional skills, motor development and even improve their chance for success in society. The question is if these claims find support in available scientific studies.

2.3 Research Questions

However strong the rhetorical power of statements and claims in favor of music (education) may be, the question that remains to be answered is: can statements be substantiated with evidence, acquired through scientific research conducted in accordance with quality criteria for such research? In other words: "What are the empirically demonstrated effects of music education on social, emotional, cognitive and motor functioning of children?"

2.4 Purpose of the Study

In this article the available scientific evidence for the effects of music exposure and music education programs on functioning of children and youth, grosso modo defined in this article as

the age group of 3-18 years old, on cognitive, social-emotional and motor functioning is reviewed. In general terms, cognitive functioning refers to one's ability to learn, remember, reason, solve problems, and make sound judgments (cognitive intelligence) and the acquisition and retention of mental representation of information and the use of this representation as the basis for behavior. Social-emotional functioning refers to the ability that enables an individual to interact and communicate appropriately and competently in a given social context. Motor functioning refers to the changes in motor skills that occur over an entire lifespan, which reflect the development of muscular coordination and control and are also affected by personal characteristics, the environment, and interactions of these two factors (see APA-dictionary, VandenBos, 2007).

The authors of this review are aware of the fact that a broad variety of interventions is included under the term music education. Music education can be defined as encompassing three categories of interventions: 1) exposure to music, 2) music instruction, and 3) music therapy. The formats of these interventions will be described later in this review.

The present review describes the impact of exposure to music and music education in formal educational settings. The main goal of this review is to provide a summary of the available scientific evidence for the effect of music education, music practice, and exposure to music on social-emotional, cognitive and motor functioning of children.

2.5 Research Methods

The main goal of this literature review is to provide an overview of the available scientific evidence for the effect of music education on child functioning for children in the age group of 3 through 18 years old, based on studies published in peer reviewed journals in the period 1995 – 2011. The selection of studies for this review focused on studies into effects of music education, either as music instruction, music exposure, or music therapy, on cognitive, social-emotional and motor functioning.

2.5.1 Literature search

The following scientific databases were consulted: ERIC, EBSCO and Academic Search Elite, as well as the internet search machines www.googlescholar.com, www.scirus.com en www.picarta.nl. Searches have been conducted only for publications in the English language. The keywords used were the following: "music", "development", "functioning", "social skills", "emotional skills", "academic skills", "academic achievement", "academic performance", "effect", "learning success", "Mozart effect", "music task performance", "perceptual motor development", "cognitive development", "affect" and "intellectual development". These keywords have been used in all possible combinations.

2.5.2 Inclusion criteria

For inclusion in the review, studies had to meet all of the following criteria:

1| The study concerned an intervention that is designated as either music instruction, exposure to music, or music therapy.

2| The study used an experimental or quasi-experimental research design with a control or comparison group. Correlational studies were excluded.

3| At least one of the described interventions must have a musical character, which means that the intervention concerned a form of music education, music therapy, or music exposure.
4| Aspects of cognitive, social-emotional and/ or motor functioning were examined as dependent variables in the study.
5| The subjects involved fell within the age range 3 – 18 years.
6| The study had been published in the period 1995 – 2011.
7| The language of the study had to be English.
8| The study has been published in a peer reviewed journal or appeared as an 'unpublished doctoral dissertation'[1].

2.5.3 Selected studies

The number of studies that met the inclusion criteria was 21. They form the research units in this review. The studies have been rated, respectively scored on a series of aspects by the authors of this review:
1| Main objective or research question;
2| Sample (N, student age, group, gender)
3| Research design (experimental/ quasi-experimental/ within subject design/ randomization/ pre-, post-, follow-up);
4| Measures;
5| Outcomes/ findings reported by the authors.

2.5.4 Independent variable: intervention formats

The major independent variable is the intervention format. The intervention format used to promote students' cognitive, social-emotional and motor functioning was categorized in the following three ways: exposure to music, music instruction, and music therapy.

Exposure to music. In a total of nine interventions (43%) subjects were exposed to music in order to measure their task performance. In three studies participants were randomly assigned to music conditions and tested after each condition (Ivanov & Geake, 2003; McKelvie & Low, 2002; Schellenberg, Nakata, Hunter & Tomoto, 2007). In five studies subjects were exposed to music and/ or background sound (favorite music (Abikoff, Courtney, Szeibel & Koplewicz, 1996), background music (Furnham & Stephenson, 2007; Hallam & Price, 1998; Hallam, Price & Katsarou, 2002), background sound & music (Furnham & Strbac, 2002)). The one intervention on motor functioning (Palmer & Meyer, 2000) used four sets of eight isochronous (constant-duration) sequences to test a transfer-for-learning task.

Music instruction. Music instruction was the most common strategy (52% (11) of the 21 interventions) used in the included studies included in this review. Music instruction can be divided in classroom-based music instruction (eight of 11 interventions), group music teaching (two of 11 interventions) and individual music lessons (one of 11 interventions). In all cases specialized music teachers conducted the music instruction. The nature of the interventions was diverse: Kodaly (Geoghegan & Michelmore, 1996); Montessori bells (Eastlund Gromko & Smith, 1998); Individual piano lessons (Costa-Giomi, 1999); Orff (Bilhartz, Bruhn and Olson, 2000; Bolduc, 2009); Increased in-school music instruction: additional vocal ensemble participation time, learning to play the recorder, exploring rhythm through

percussion, and intro to music and technology (Rossini, 2000); Playing Orff-instruments, recorder lessons, instrumental lessons, special music projects (Bastian 2002); Music and movement (Zachopoulou. Tsapakidou & Derri, 2004); Instruction based on Jerome Bruner's theory of cognitive representation: singing songs, accompanied with simple body percussion or kinesthetic movement (Eastlund Gromko, 2005); Voice or keyboard lessons (Schellenberg 2004); Musical improvisation (Koutsoupidou & Hargreaves, 2009).

Music therapy. One intervention (Ulfarsdottir & Erwin, 2000) involved a short-term music therapy intervention, based on techniques of musical dialogues and improvisations. The children experimented with different rhythms, volume, sources and sound. They created their own instrumental music, as well as melodies and lyrics.

2.6 Findings

In the following section the general outcomes will be described briefly, following authors' descriptions in the published studies. Twenty-one studies were identified that met the inclusion criteria. Twenty of these studies focused on one area of functioning. Eighteen of the 21 selected studies focused on children's cognitive functioning. One of the 18 studies on cognitive functioning also examined the effects of music education on social-emotional functioning. One of the 21 studies solely addressed social-emotional functioning. Two of the 21 studies described the effects of music education on motor functioning of children.

Most studies, namely 15 of 21, date from the period 2000 – 2007. The vast majority is Anglo-Saxon and conducted in North America (10) and the United Kingdom (7). Of the remaining four studies one came from Germany, two from Australia, and one from Greece.

Eight of the 21 studies concern an intervention with children in the age of 3 - 6 years old. Eleven studies deal with an intervention for children in the age of elementary education 6 - 12 years, one study regards to the age group 12 - 18 years. And one study regards to the age group 4 - 12 years.

The total number of subjects included in this literature review is 1750. Two of the included studies had less than 25 subjects. Five studies had between 25 and 50 subjects. Two studies had between 50 and 75 subjects. Five studies had between 75 and 100 subjects, and seven studies had more than 100 subjects. In the following section we report the outcomes of the identified studies on different dimensions.

2.6.1 Cognitive functioning

Eighteen of the 21 identified studies were intervention studies that focused on cognitive functioning. These studies can be divided into three categories: 1) studies in which the influence of music is studied in relation to the academic performance of children (Bastian, 2002; Bolduc, 2009; Eastlund Gromko, 2005; Geoghegan & Mitchelmore, 1996; Rossini 2000); 2) studies with regard to enhancement of cognitive task performance (including the so called "Mozart effect') (Bilhartz et al., 2000; Costa-Giomi 1999; Eastlund Gromko & Smith Poorman, 1998; Hallam et al., 2002; Hallam & Price 1998; Ivanov & Geake, 2003; Koutsoupidou & Hargreaves, 2009; McKelvie & Low, 2002; Schellenberg, 2004;

Schellenberg et al., 2007), and 3) intervention studies in which music has been investigated as facilitator of cognitive processes (Abikoff et al., 1996; Furnham & Stephenson, 2007; Furnham & Strbac, 2002). In this latter category, the extent to which music or sound distracts children from a given assignment is examined. Difference between the second and third group of studies consists in their focus: the second group concentrates on the direct positive effects of music and sound on cognitive task performance, while the third group focused on the facilitation of cognitive processes by mitigating the influence of existing cognitive impediments.

Of the studies that reported on the influence of music on cognitive development, the majority, i.e. eight of 18 studies (Abikoff et al., 1996; Bastian, 2002; Bilhartz et al., 2000; Bolduc, 2009; Eastlund Gromko, 2005; Furnham & Strbac, 2002; Hallam & Price, 1998; Schellenberg et al., 2007) reported positive outcomes of the intervention; seven studies (Furnham & Stephenson, 2007; Geoghegan & Kitchelmore, 1996; Hallam et al., 2002; Koutsoupidou & Hargreaves, 2009; Ivanov & Geake, 2003; Rossini 2000; Schellenberg, 2004) reported a moderate positive outcome, and in three studies (Costa-Giomi 1999; Eastlund Gromko & Smith Poorman, 1998; McKelvie & Low, 2002) the intervention had no influence on the cognitive functioning of the children.

2.6.1.1 Academic performance

Of the five studies that investigated the effect of music education on academic performance Geoghegan and Mitchelmore (1996) investigated the impact of music education on mathematics achievement in preschool children. Their intervention was based on Kodaly techniques, sequenced to concepts of pitch, dynamics, duration timbre and form, as well as skills in movement, listening, singing and organizing sound. The control group had no music intervention at all. The music intervention lasted for 10 months, one hour a week.

The initial scores of children in the experimental group on the Test of Early Mathematics Ability-2 were higher than the children in control group. For further analysis the experimental group was divided into two groups: children with music at home and children without music at home. Musical experiences at home (listening to their own music collection, and listening to a family member singing to the child) and other pre-existing differences (not specified by the authors of the study) may have contributed to group differences. There was no difference in mathematics achievement between the control group and the experimental group without music at home. However, the experimental group with music at home scored higher in mathematics achievement than the experimental group without music at home. This finding, however, might also indicate a stimulating home environment in this group that goes beyond the domain of music.

Rossini (2000) investigated whether increased in-school music instruction would positively affect students' achievement levels as measured by an achievement test in reading, language arts, and mathematics. Increased music instruction in this study meant additional vocal ensemble participation time, musical instruction on learning to play the recorder (both practice and performance), exploring rhythms through percussion instruments and an introduction to music and technology through the use of computers and specific software.

The outcomes of this study indicated there was possibly some benefit of the increased music instruction. However, the results remain inconclusive due to the fact that specific links between subjects were not clearly defined. Rossini also determined that while some increase in achievement levels was established for students in the research group, their scores were not significantly higher than those of the students in the comparison group. Qualitative evidence showed a need for increased cooperative planning among regular classroom teachers and music specialists. Overall, we have to conclude there was no demonstrable effect of the increased music instruction.

From his 6-year research project Bastian (2002) concluded that children who attended music education at the age of 8 through 11 years old showed significantly better results with regard to school subject matters such as spelling and arithmetic, compared to children without extended music education (N = 170). The music education program offered to the experimental group included singing, playing Orff instruments, recorder lessons with the whole class or in smaller groups. From grade 3 (about 8 years old) children could follow instrumental lessons, and special music projects were conducted. In the experimental group the music program was conducted by a music specialist. The control group only got one or two hours music education a week as prescribed by law. These music lessons were conducted by the classroom teacher.

Besides the influence of music education on academic achievement, Bastian's participants were subjected to intelligence tests. The results of these tests confirmed the hypothesis that children benefited from music education and developed faster in arithmetic, abstract reasoning and general development. For children with an average IQ, no significant difference in development was found during the first years of the elementary school between the experimental and control group. However after five years at school and four years of extensive music lessons, the children in the experimental group showed a significantly higher IQ. The IQ of children in this group with an above average IQ from the start, improved more noticeably after 4 years of lessons in solo- and ensemble playing than that of comparable children from the control group without comprehensive music education. Bastian concluded that the development of children who were socially weak and backward in IQ (having a lower IQ than average) also benefited from extended music education. Their IQ increased with the years, what could not be concluded about the children with a low IQ in the control group. (Bastian, 2002, p. 278).

Bastian (2002, p. 343 ff) reported another significant finding with regard to the children's ability to concentrate, namely that children with the biggest concentration problems were in the control group. They had a demonstrably poorer concentration than the lowest scoring children in the experimental group. This in contrast with the beginning when the control group had a significant better percentile score than the experimental group. Bastian concluded from this that music education can help children with concentration problems. Music education can compensate the lack of concentration. The authors of this review, however, question the internal validity of these conclusions. Although the outcomes of this study are remarkable, it cannot be excluded that activities other than the music intervention (e.g. Hawthorne-effect due to the long-term positive attention) could have had a positive effect on intelligence and concentration.

Eastlund Gromko (2005) conducted a study to determine whether music instruction was related to significant gains in the development of young children's phonemic awareness, particularly in their phoneme-segmentation fluency. Children in the experimental group received 4 months of music instruction, while the children of the control group received no music instruction. Music instruction in this study consisted of weekly sessions of 30 minutes conducted by advanced music-methods students, under supervision of the kindergarten teacher. The music treatment was based on Jerome Bruner's theory of cognitive representation (1966). At the heart of the music instruction the children learned to sing a new folk song, accompanied with simple body percussion or kinesthetic movement (dancelike movement to help children to organize their perception of musical sound in time and space). Finally, children touched a graphic chart while singing that consisted of, for example, clots to represent steady beat, squares and rectangles to represent word rhythms, or lines to represent melodic contour. Whereas beginning readers of text learn to connect sounds to graphemes or letters, beginning readers of music learn to connect perception of rhythm and pitch to graphic shapes that look the way sound goes.

An analysis of data revealed that the children who received music instruction showed significant greater gains in development of their phoneme-segmentation fluency. The results of this study supported a near-transfer hypothesis that active music making and the association of sound with developmentally appropriate symbols may develop cognitive processes similar to those needed for segmentation of a spoken word into its phonemes.

Bolduc (2009) conducted an intervention study in which the influence of music training programs on phonemic awareness skills of children was studied ($N = 104$). Phonemic awareness skills are a subset of phonological awareness skills in which listeners are able to hear, identify and manipulate phonemes, the smallest units of sound that can differentiate meaning. In this study, two interventions were compared. The experimental group was exposed to an adapted version of the Standley and Hughes music training program for children with special needs, which integrated some principles from the Orff Schulwerk's approach, but was for the most part inspired by studies in the fields of music therapy and music education. The four objectives of this program were: 1) to give rise to skills related to song and instrumental interpretation; 2) to incite children's creativity; 3) to develop the musical receptivity of the children; and 4) to awaken the children's musical comprehension. In this program, emergent literacy, the reading and writing behaviors that precede and develop into conventional literacy, was achieved by analyzing lyrics, composing rhythmic rhymes, reading children's books associated with musical concepts (i.e. making instruments, meeting great composers) as well as writing words (i.e. songs or names of instruments).

The program of the control group was, at the music level, an equivalent of the experimental program. This program had three main competences: 1) inventing vocal or instrumental pieces that engaged pupils in age-appropriate activities of improvisation, arranging and composition; 2) introducing pupils to interpret musical pieces using a variety of vocal and instrumental repertoire of different eras; and 3) appreciating musical works, personal achievements and peer achievements. This curriculum also allowed pupils to experience various cultures through exposure to multicultural musical samples. Listening and creation activities (compositions, adaptations, et cetera) were meant to awaken the children's critical thought and aesthetic awareness.

Bolduc concluded that both music-training programs contributed similarly to the development of tonal and rhythmic perceptive skills. However, the experimental music-training program proved to be more effective when it came to developing phonological awareness skills (F = 0.063, $d.f.$ = 101, p < 0.01). In conclusion, this article argued that auditory perception, phonological memory and meta-cognitive abilities play an essential role in the development of musical and linguistic skills.

2.6.1.2 Enhancement of cognitive task performance

There is also a number of studies that looked into the effect of specific forms of music on aspects of intelligence, in particular spatial reasoning. This has become well known as the so called Mozart effect. The Mozart effect refers to the phenomenon that people's spatial reasoning enhances after listening to music of Wolfgang Amadeus Mozart.

The Mozart effect was first documented in 1993 by Rauscher, Shaw & Ky. They conducted an experiment with 36 college students whereby a possible causality between music cognition and spatial reasoning performance was investigated. Students were assigned to 3 music conditions: 1) listening to a Sonata for 2 pianos in D major of W.A. Mozart (KV 448); 2) listening to relax instructions; and 3) silence. Each of the listening conditions lasted for 10 minutes. All students took part in each condition. The students were tested after each condition with a Stanford-Binet-Intelligence scale. Translated to spatial IQ, the results after listening to the piano Sonata were 119, 111 after relaxation and 110 after silence. Rauscher et al. (1993) found a remarkable and significant difference between the music condition and the other 2 conditions.

In line with the study of Rauscher et al. (1993), Bilhartz, Bruhn and Olson (2000) conducted a study into the effect of music and cognitive functioning of young children. However, they focused on the effect of early music training on child cognitive development. They also indicated a significant relation between participation in a structured music curriculum and cognitive development (N = 71). The results of this study underpinned the hypothesis that a significant relation exists between music education at a young age and cognitive development of specific non- musical skills. Even children in this study who received a minimum music intervention, scored significantly higher than children in the control group on one measurement with regard to abstract reasoning ability, namely de Stanford-Binet Bead Memory subtest. The improvements were the biggest for the participants who fully attended the program. This link between the music intervention and memory (Bead Memory score) was of special importance because this subtest showed both spatial-temporal reasoning abilities and sequencing strategies. Both mental processes were speculatively described in terms of neural firing patterns necessary for performing activities, including music (Leng et al., 1990).

McKelvie and Low (2002) investigated the Mozart effect as documented by Rauscher, Shaw en Ky (1993) with 55 school-aged children between 11 and 13 years. Because music that sounds like the piano sonata of Mozart tended to reproduce the Mozart-effect. McKelvie and Low chose to use a completely different kind of music as a stimulus next to the music of W.A. Mozart, namely dance music of the band Aqua. The participating children were directed to 4 groups that were tested in 4 sessions. The groups were exposed to Mozart's music, or the music of Aqua as a music condition. There was no significant main effect of music and

no significant difference between the pretest and post-test scores for both groups. Owing to the non-significant findings, a second experiment was carried out. The researchers used a methodology that had previously replicated the Mozart effect. Again, the second experiment did not support the claim that Mozart's music can enhance spatial performance. Groups performed similarly on the control test and the experimental test, irrespective of whether they listened to Mozart or to popular dance music. Although the two different designs produced similar findings, the data suggest that the Mozart effect is so ephemeral that McKelvie and Low (2002) question whether any practical application will come from it.

Also Ivanov and Geake (2003) tried to reproduce the Mozart-effect. Except for the reproduction of the effect, the researchers wanted to know if the Mozart effect could only be produced if children listened to music of W.A. Mozart. The 76 participants cooperating in this study were assigned to 3 conditions. In the first condition the participants listened to the Sonata in D, KV448 of W.A. Mozart. The second condition consisted of listening to a piano version of the Toccata in G major, BWV 916 of J.S. Bach. The third condition implied listening to background noise. This latter was the control group. Both the participating children from the first and the second condition performed significantly better than the children in the control group. The researchers believed that this study is the first study to find a Mozart effect for school children in a natural setting, in contrast to the original study of Rauscher, Shaw and Ky (1993) who examined the effects of listening to W.A. Mozart on the spatial task performance of university students in a laboratory setting. They also concluded that the Mozart effect is not only provoked by music of Mozart, but also by music of other composers.

Schellenberg, Nakata, Hunter & Tomoto (2007) conducted two experiments with regard to the Mozart effect on cognitive abilities. The first of the two studies was conducted with subjects between 18 and 23 years old and thus is beyond the scope of this review. The second experiment was conducted with 39 Japanese children at the age of 5 years old. They were tested on their creative abilities after exposure to music of Mozart, Albinoni or well-known children's music (listening or singing). Schellenberg et al. (2007) concluded from their study that the children exposed to well-known children's songs showed a longer enhancement compared with T_0 than children who had been children drawing after listening to music of Mozart or Albinoni. Their drawings were also considered more creative, energetic and technically driven, by adults, after listening or singing. The results didn't show significant differences between listening to well-known children's songs and the singing of these songs. Both ways were effective in enhancing the creativity of young children. Schellenberg et al. (2007) concluded that the results indicated that 1) exposure to different types of music can enhance performance on a variety of cognitive tests; 2) these effects were mediated by changes in emotional state, and 3) the effects generalize across cultures and age groups.

The studies above studied the enhancement of cognitive task performance specifically related to the so called Mozart effect. The next four studies also investigated the enhancement of cognitive task performance, however regardless of the Mozart effect (Costa-Giomi 1999; Eastlund Gromko & Smith Poorman, 1998; Koutsoupidou & Hargreaves, 2009; Schellenberg, 2004).

Eastlund Gromko & Smith Poorman (1998) investigated the effect of music training on preschoolers' performance IQ. The experimental group received weekly music training during 6 months time. The children, all preschoolers from a private Montessori school that were in the experimental group received a 20-note set of songbells to keep at home for practice. Each week, children took a practice plan home, so parents could guide their children's practice. Every child received a tape of songs, to be played and sung between the music sessions.

A new song was presented in each session. The sessions were designed to involve the children's motor system in response to musical sound, to draw their attention to pitch and rhythmic aspects of songs, and to increase their memory for musical sound. Therefore, children sang the new song several times; accompanied their singing with body percussion; took turns playing a simplified version of the song on songbells or hand chimes; made a picture of the song using round stickers on a paper; and followed a tactile touch chart that outlined the contour of the song. In addition two familiar songs were danced and sung.

Regression of IQ gain scores on age showed significantly less gain for older children in the control group. A regression analysis showed that the relationship of Performance IQ to age was not significant for the experimental group. Slopes intersected at age 3. For 3-year-olds in this study, an intellectually stimulating environment, per se, results in a gain in ability to perform spatial-temporal tasks.

Costa-Giomi (1999) studied the relationship between music and cognitive abilities by observing the cognitive development of children provided, and not provided individual piano lessons. Each child in the experimental group received, at no cost, three years of piano instruction. The lessons were 30 minutes long during the first two years, and 45 minutes during the third year.

It was found that the treatment affected children's general and spatial cognitive development. The magnitude of such effects (omega squared) was small. Additional analysis showed that although the experimental group obtained higher spatial abilities scores in the Developing Cognitive Abilities Test after one and two years of instruction than did the control group. However, the groups did not differ in general or specific cognitive abilities after three years of instruction. The treatment did not affect the development of quantitative and verbal cognitive abilities.

Schellenberg (2004) conducted a study to test the hypothesis that music makes smarter. A large sample of children was randomly assigned to two types of music lessons (keyboard or voice) or to control groups that received drama lessons or no lessons. The lessons were taught for 36 weeks at the Royal Conservatory of Music in Toronto. Qualified instructors, in groups of six children, gave the lessons.

IQ was measured before and after the series of lessons. Compared with children in the control groups, children in the music groups exhibited greater increases in full-scale IQ. The effect was relatively small, but it generalized across IQ subtests, index scores, and a standardized measure of academic achievement. Unexpectedly, children in the drama group exhibited substantial pre- to post test improvements in adaptive social behavior that were not evident in the music groups.

A study with regard to the enhancement of cognitive task performance is conducted by Koutsoupidou & Hargreaves (2009). Koutsoupidou & Hargreaves investigated the effects of improvisation on the development of children's creative thinking in music. The study was conducted in a primary school classroom with two matched groups of 6-year-old children over a period of six months. The music lessons for the experimental group were enriched with a variety of improvisatory activities, while those in the control group did not include any improvisation. These lessons were didactic and teacher-centered. Children in the experimental group were offered several opportunities to experience improvisation through voices, their bodies, and musical instruments. Analysis of the data obtained with Webster's Measure of Creative Thinking in Music – MCTC revealed that improvisation affects significantly the development of creative thinking, in particular musical flexibility, originality, and syntax in children's music making.

2.6.1.3 Music as facilitator of cognitive processes

A separate category of intervention studies with regard to music and cognition is a group of four studies in which music is studied as a facilitator of cognitive processes. The studies in the section above on enhancement of cognitive task performance focused on the contingent positive effects of music on cognitive task performance. Studies below enquired the contingent negative effects of exposure to music. Can music be a facilitator of cognitive processes and mitigate obstructions of cognitive task performance? Music allegedly can have a cognitive effect on the performance of certain tasks e.g. academic task performance. The question is whether personality factors, such as introversion or extraversion, do have a moderating influence on this.

Abikoff, Courtney, Szeibel & Koplewicz (1996) studied the effect of listening to the favorite music of children on their academic performance. They studied this on children with attention-deficit/hyperactivity disorder (ADHD, N = 40). The tests were taken under experimental conditions: 1) 10 minutes music; 2) 10 minutes background speech; and 3) 10 minutes of silence. The results showed that children with ADHD who listened to music during the first condition had twice as many correct answers as compared to children with ADHD who listened to music as a second or third condition. It can be concluded that music has a significant positive effect on the academic performance for children with ADHD.

Hallam and Price (1998) investigated if the use of background music can improve the behavior and academic achievement of children with emotional and behavioral difficulties. They conducted a study with eight children at a school for children with emotional and behavioral difficulties.

The design of the study was counterbalanced with each student acting as his/ her own control. The first four trials were completed without background music, followed by four trials with background music. After one week the procedure was repeated in reverse order for three trials under each condition. The music for this study was selected based on previous research with children by Gilles (1991) as 'mood calming'. For each session two measures were recorded: the number of correctly completed mathematic problems, and the number of times rules were broken.

The effect of the music intervention was significant. There was a significant improvement in behavior and mathematics performance for all the children. The effects were particularly marked for those whose problems were related to constant stimulus seeking and over-activity. Improvements were also observed in improved cooperation and a reduction in aggression during the lessons immediately following the study.

Furnham and Strbac (2002) studied whether background noise would distract children in their performance as much as music does. In this study Furnham and Strbac also compared the performance of introverts versus extraverts in both conditions. Previous studies had found that introverts' performance on complex cognitive tasks were more negatively affected by distracters, e.g. music and background television, than by extraverts' performance. A reading comprehension task, a prose recall task and a mental arithmetic task was carried out by all 66 subjects. The data of this study showed that the performance of the children decreased in the presence of music and noise as compared to silence, but in the presence of music and noise extravert children performed better than introvert children. A significant interaction was found on the reading comprehension task only, although a trend for this effect was clearly present on the other two tasks. These outcomes supported Eysenck's hypothesis which holds that introverts have a lower level of optimum cortical arousal than extravert children, which influences their performance in the presence of music. Introverts and extraverts have different optimum levels of arousal, with introverts having a lower level and extraverts a higher level, thus it was expected that background music, which increases levels of arousal, could have a more negative affect on introverts as it causes them to be beyond their optimum functioning level. In contrast, extraverts, who have a higher level of optimum cortical arousal, will not exceed their optimum functioning level (Eysenck, 1981).

Hallam, Price & Katsarou (2002) explored the effects of music perceived as calming and relaxing on performance in arithmetic and on a memory task in two studies. In the second study by Hallam et al. (2002), the researchers selected music of which they expected it would be experienced pleasant or unpleasant, arousing, and aggressive by the 30 participants. The students were given the assignment to learn sentences by heart that were presented to them in written from a booklet. Then, they were asked to add the missing sentences in this booklet. From the results, Hallam et al. draw the following conclusion: "The calming music led to better results on both tasks, compared with a non-music condition. Music perceived as arousing, aggressive and unpleasant disturbed the memory task and caused less altruistic behavior by children. The altruistic behavior by the children was assessed by means of a series of stories whereby the children were asked to choose an answer." The outcomes of this study suggest that the effects of music on the performance of a task is influenced indirectly via arousal and mood, rather than by directly affecting cognition. The type of background music played can be clearly defined by a group of listeners as calming and pleasant or arousing and unpleasant, it can have distinctive effects on task performance and the reporting intended altruistic behavior. Calming relaxing music can have a positive effect on for example problem solving, while music perceived as arousing, unpleasant and aggressive, can have a negative effect on task performance and led to a lower level of reported pro-social behavior (Hallam et al., 2002).

Furnham & Stephenson (2007) studied the nature of the interaction between the affective value of musical distraction, personality type and performance on the cognitive tasks of reading comprehension, free recall, mental arithmetic and verbal reasoning in children aged 11–12 years (*N* = 118). It was hypothesized that the cognitive performance of extraverts would be significantly poorer when in presence of background music that had a positively affective value. It was predicted that the converse of this would be true for introverts and neurotic personality types.

The result of the study was not statistically significant ($t(62) = -9.19$, $p = .06$): the affective value of the distracter (positive versus negative) had no significant impact on the performance of the four cognitive tasks by extravert children. According to the authors, however, . the outcome was close to significance and could be taken as an indication that the affective value of the distracter had some effect on the cognitive performance of extravert children.

2.6.2 Social-emotional functioning

Of the selected studies, two of the 21 focused on social-emotional functioning (Bastian, 2002; Ulfarsdottir en Erwin, 1999).

In their study on the influence of music on social cognitive skills, Ulfarsdottir and Erwin (1999) studied the question whether skills in interpersonal cognitive problem solving would improve by a short music therapy intervention in regular pre-schools. The music therapy program emphasized the techniques of musical dialogues and improvisation. The children experimented with different rhythms, volume and sources of sound. They created their own instrumental music, as well as melodies and lyrics. This study was conducted with 77 children in Iceland pre-schools. One class in each of two pre-schools was randomly allocated to one of two conditions. Participants in condition 1, the experimental condition (*N* = 27) received a short-term music therapy intervention. Condition 2 (*N* = 33) constituted a no-treatment control. Condition 3 (*N* = 16) was a comparison condition, consisted of a class of pre-schoolers in an institution with an established musical enrichment program.

No significant differences were observed in the control or intervention group between the pre- and post interventions assessments. However, a follow-up test showed a significant difference after seven months. The children who had attended the music therapy program, showed a significant improvement with regard to alternative solution thinking and consequential thinking, which appeared to generally underpin social adjustment, as compared to children in the control group. For the children in condition 3, the musically enriched pre-school, there was a highly significant difference in their alternative solution thinking and consequential thinking scores compared to children in the control group.

Besides the effect of music education on academic achievement Bastian (2002) also studied the influence of music education on children's social skills. Both the experimental group and the control group were subjected to sociometric research in which children were questioned about their factual and desirable interactions in the classroom. This yielded a bigger number of positive responses in the experimental group. From these outcomes, Bastian (2002, p. 310 - 311) concluded that the hypothesis was confirmed that music education can improve the social climate in a classroom and the school as a whole.

One and a half year after reaching these results, the ability to think over social situations in both the experimental as the control group had diminished. There was however a significant difference between both groups. At that moment in time, children in the control group scored about 70% under the average, while 51% of the children in the experimental group scored above or equal to the average (Bastian, 2002, p. 304 - 308). Bastian suggested that music forms an appropriate means to handle feelings of aggression, pride and insecurity and supports a desire for independence.

2.6.3 Motor functioning

From the selected studies, two of the 21 focused on motor development. Palmer and Meyer (2000) studied motor development of young pianists. Zachopoulou, Tsapakidou & Derri (2004) studied a music and movement program.

Palmer and Meyer (2000) studied the motor independency for music performance in a transfer-of-learning task (N = 16). With a transfer-of-learning task is meant a task in which movement control is learned in one situation and transferred to another. This often provides insight into the contents of mental plans for actions (Schmidt & Young, 1987). Thereby they wondered if the mental plans for action, abstract or specific, were in terms of movement with which they are produced. Using 4 sets of 8 isochrone (constant-duration) sequences developed by the authors, the participants were assessed. A sequence is the immediate restatement of a motif or longer melodic (or harmonic) passage at a higher or lower pitch in the same voice. In this case a restatement of a melodic motive, played on the piano. Greatest effect of transfer was observed when the same conceptual relations were retained from training to transfer, regardless motor movements. More experienced child pianists showed transfer on both motor and conceptual dimensions; the least experienced demonstrated transfer only to sequences with identical motor and conceptual dimensions. These findings suggest that mental plans for action become independent of the required movements only at advanced skill levels.

Zachopoulou, Tsapakidou & Derri (2004) studied the effects of a developmentally appropriate music and movement program and an also developmentally appropriate physical education program of jumping and dynamic balance. 90 Children participated in this study. The students were randomly divided into two groups. The experimental group participated in a music and movement program, based on rhythmic education principles of the Orff approach, while the control group received physical education. Both groups were tested on their jumping and dynamic balance skills. The results showed that the experimental group had made a significant development on both jumping as dynamic balance. Zachopoulou et al. concluded that a developmentally appropriate music and movement program can have a positive effect on jumping and dynamic balance for preschool children.

2.7 Conclusions

Our review of the literature warrants the conclusion that overall child functioning is positively affected by music, either music exposure, or in-school music education. This effect is most convincingly demonstrated with regard to cognitive functioning. Of the 18 studies reviewed

15 indicated substantive to moderately positive effects on one or more cognitive parameters. Specifically positive effects have been found on enhancement of cognitive task performance, such as concentration and special task performance, on academic performance, and music as a facilitator of cognitive processes. Three studies (Costa-Giomi 1999; Eastlund Gromko & Smith Poorman, 1998; McKelvie & Low, 2002) showed no positive influence of music exposure or music education on the cognitive functioning of the children. Eastlund Gromko & Smith Poorman's study to the effect of music training on preschoolers' spatial-temporal task performance (1998) didn't show significant effects. Neither did the study done by Costa-Giomi (1999) into the relationship between music and cognitive abilities by observing the cognitive development of children with or without individual piano lessons. McKelvie and Low (2002) performed two experiments to replicate the Mozart effect. Both experiments did not support the claim that Mozart's music can enhance spatial performance.

As to social-emotional functioning the picture that emerges is also that music exposure (Ulfarsdottir & Erwin, 1999) or music education Bastian (2002) has substantive to moderate effects on interpersonal problem solving, interactions in the classroom, and the ability to reflect upon social situations. However, the number of studies to substantiate such a conclusion on 2 studies in total is so small, that it has to be drawn with great caution. The more so, because these studies differ substantially from one another in design, intervention and outcome parameters.

The same can be said about the effect of music exposure or music education on motor functioning. Only two studies that met the inclusion criteria could be identified. Both studies showed positive effects of music education on motor independency (Palmer and Meyer, 2000), and jumping and dynamic balance (Zachopoulou, Tsapakidou & Derri, 2004).

In almost all studies reviewed, both those that focus on cognitive, social-emotional as well as on motor functioning, the positive effects of music exposure and music education either appeared to be short-lived or no follow-up data on the sustainability of effects were available. There is only one study (Bastian, 2002) that indicates long-term effects. Overall, with an exception for the studies on the Mozart-effect, the studies reviewed differ widely in terms of design, music intervention and measures applied. Besides the samples used are generally small.

Additionally, the wide diversity of music interventions used, is problematic. The review shows that there are almost as many types of music interventions as there are studies. Consequently there is little standardization. Furthermore written manuals for their implementation are virtually absent. This in and by itself makes it virtually impossible to identify effective ingredients or components of music interventions as well as dose-response relationships. As a result, proper replication, with an exception for the Mozart-effect, is absent. In addition, it can also not be excluded that certain effects observed, such as with regard to social-emotional development (e.g. positive effects on interpersonal problem solving), could and therefore should be more parsimoniously attributed to non-specific factors, such as group processes or Hawthorne effects, than to music education as such.

In summary, any conclusions regarding robust effects of music exposure and education on cognitive, social-emotional and motor development are premature. This does not mean that

no such effects exist, but the present state of research has not been able yet to identify such effects in a reliable, valid and sustainable manner. One of the reasons for this state of affairs might be that the world of music educators and the world of rigorous scientific research have not combined forces enough and where they have, not profoundly enough. Such despite the fact that, as Levitin (2006) shows so eloquently in his treatise "This is your brain on music", music evolved in human's evolutionary history because it promotes cognitive development. Or to put it differently, the function of music for the child brain is that it prepares the brain for a number of cognitive and social activities (Cosmides & Tooby, 1989). Apparently, until now we have not been able to answer that essential question regarding music education, namely; "What does to Whom or What Where When How and Why?" ■

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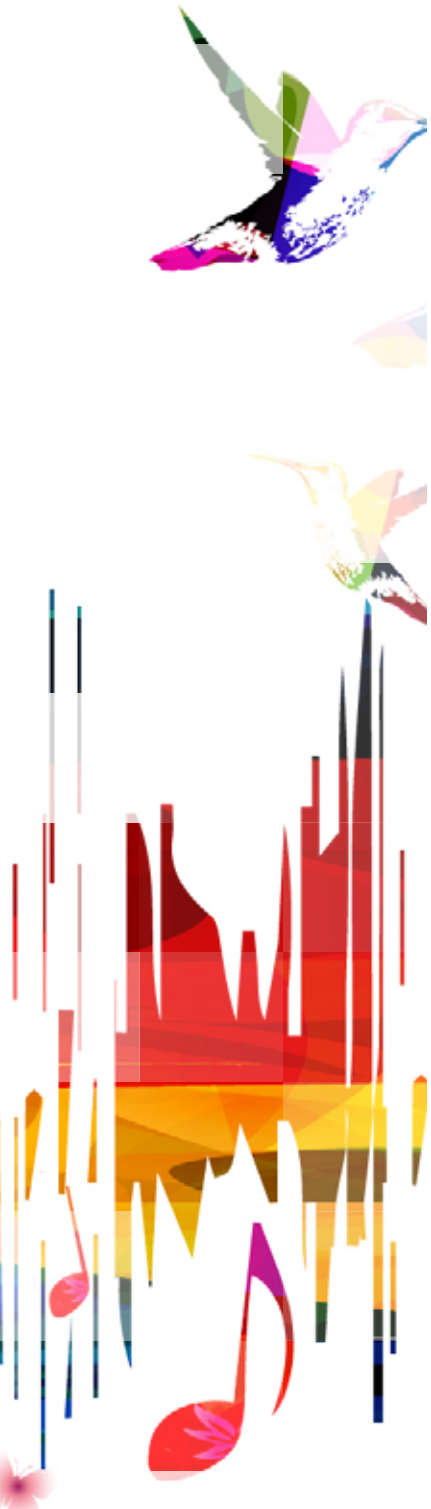
Consulted website
http://www.menc.org/resources/view/why-music-education-2007 (13 juli 2009)

Endnotes

[1] One exception had been made: Bastian, H.G. (2002). *Musik(erziehung) und ihre Wirkung. Eine Langzeitstudie an Berliner Grundschulen*, Mainz: Schott. This study is included as it tries to answer the same research question as ours and represents a long-term and large-scale study. Given these characteristics of the study, we consider it an exceptional kind of study that we didn't want to exclude from the review for the reason that it fails on just one criterion.

PLAYING MUSIC

A PERSPECTIVE ON MUSIC EDUCATION USING THE CULTURAL-HISTORICAL ACTIVITY THEORY OF LEARNING AND DEVELOPMENT



Abstract

Many school subjects have been the subject of innovation, by making the step from a reproductive approach to a more productive one, in which young children are actively involved in the construction of the objects that are relevant in their respective disciplines. Although similar steps towards productive music engagement have been proposed and taken in music education over the past decade by many music teachers, there are still important steps to take to truly innovate in music teaching in elementary education. Based on what is known about play as a phenomenon in young children's everyday life and the research that has been done into play, it is claimed that play and music education can be combined in order to answer the question relating to productive music education. The aim of the current study is to develop an argument for a play-based curriculum in music education. The main research question of this study is is: *"How can musical activities with children be conceptualized as playful activities that establish optimum conditions for (musical) learning outcomes?"* From the perspective of Cultural-Historical Activity Theory, this question has been answered in the following way: play can be conceived of as a way of carrying out human activities. All human activities can be accomplished in more strict and mechanistic ways or in more free and joyful ways, and the same can be said of music activities. Musical play is a mode of activity defined by the three parameters of the activity format: rules, degrees of freedom, and involvement. Although there are many music activities that allow for playful versions, it is argued here that *music composition* activities in particular follow the play format of activity and offer children opportunities to create their own music. Music composition can be offered as a playful activity in elementary schools. Children are able to, and want to, participate in such activities and actively appropriate musical skills and knowledge while creating their own music composition(s). However, they need assistance to improve their ability to participate in cultural practices, like music composition.

Hogenes, M., Van Oers, B., & Diekstra, R.F.W. (2016) Playing Music. A perspective on music education using the Cultural-Historical Activity Theory of learning and development. *Under review.*

3. PLAYING MUSIC

A Perspective on Music Education using the Cultural-Historical Activity Theory of Learning and Development

3.1 Introduction

Music education in elementary school (in the Netherlands: 4 - 12 year olds) is traditionally seen as a way of introducing young children into their cultural community's music by singing songs, and listening to popular and classical music. Over the years, we have seen advances that have broadened children's experiences with music by introducing music and movement, and supporting active music listening and the playing of instruments, including reading musical scores.

Despite these advances, mainstream music education in the Netherlands has remained a school-based enterprise of a mainly reproductive nature. Children are involved in all kinds of activities and experiences that engage them in the reproduction of music of their own and other cultures, either by listening to popular or classical music, singing existing cultural songs, or playing (easy) sheet music. Without doubt, this approach will succeed in revealing and encouraging talents, but for the general student population, music education today is not very successful in raising its level of musical development beyond the point of maturation and incidental moments of development based on experiential learning in everyday practices.

Many school subjects have been the subject of innovation, by making the step from a reproductive approach to a more productive one, in which young children are actively involved in the construction of the objects (subject matters) that are relevant in their respective disciplines. Mathematics education, for example, changed about three decades ago into an activity of productive mathematising (students actively producing mathematical knowledge), rather than fast reproduction of errorless answers (see Freudenthal, 1978). This way of teaching productive mathematising in elementary school is now a widely distributed common practice in most Western countries and has proved successful in developing mathematical thinking in schools (see for example, Thompson, 2000).

Although similar steps towards productive music engagement have been proposed and taken in music education over the past decade by many music teachers (Barrett, 2011; Kaschub & Smith, 2013; Wiggins & Espeland, 2012), there are still important steps to take to truly innovate in music teaching in elementary education. Niland (2009) noted that music educators traditionally aim to offer children activities to improve their musical skills. Although music educators commonly recognize the importance of making music enjoyable, the teaching of music education for young children is still mostly based on teaching them to sing songs selected by teachers and is structured around specific behavioral outcomes. Based on what is known about play as a phenomenon in young children's everyday life and the research that has been done into play, we will claim in this article that play and music education can be combined in order to answer the question relating to productive music education.

As yet, however, it is still unclear how this approach can be theoretically underpinned and what kind of practices should be implemented to enhance children's music learning, as well as extra-musical developmental qualities (like social cognition, intellectual achievements, interests, motor skills, etc). The aim of this article is to develop an argument for a play-based curriculum in music education. The main question that we will try to answer is: "*How can musical activities with children be conceptualized as playful activities that establish optimum conditions for (musical) learning outcomes?*"

It will be necessary to take a number of preliminary steps to answer this question. To begin with, the article will concentrate on the phenomenon of play and emphasize the essentially productive nature of play. From the perspective of cultural-historical activity theory, the article will advance an interpretation of play that can clarify the playful nature of music-making (see also Lieberman, 1977; Bundy, 1997), explain the necessity of participating experts, as well as explaining the possibility of goal-directed learning without destroying the quality of play. On this basis, the article will ultimately propose a practical strategy for playful music education.

3.2 Highlights from the history of play studies

Play and development of young children are inextricably linked with one other (Dewey, 1933; Fleer, 2010; Göncü, & Gaskins, 2007; Pellegrini, 2009; Piaget, 1951; Vygotsky, 1978). Play, according to Huizinga (1938), is a characteristic of human beings as participants in cultural practices. He therefore called human beings "ludiek" (playful), from the Latin word "ludere" (to play). According to Huizinga, play is a cultural phenomenon. Play is not about real life, but to "retire into a temporary sphere of an activity with its own scope" (Huizinga, 1950, p. 35). Huizinga (1950) argues that play is the cradle and the engine of all culture. All cultural practices develop as play. It is the most essential activity of the safe child in an emerging world (Langeveld, 1972, p.56). Erikson (1950) stated that child play is the infantile form of the human ability to assimilate experiences. Sutton-Smith (1997) critically reviewed many claims of play theories as to their influence on children's development and concluded that the main value of play for children's development may be that play creates opportunities for becoming better players and becoming engaged in a facsimilization of the struggle for cultural survival (see Sutton-Smith, 1997, p. 231).

As many play researchers have pointed out, there is much ambiguity around play, such as the purpose of play, and the role of adults in child play. But most people agree on one point: young children enjoy playing. They not only enjoy themselves in play; they also learn by play (Berk, 2010).

Generally, enjoyment (pleasure) is considered one of the defining characteristics of play (Smith, 2010). In addition to pleasure (joyfulness), the intrinsic motivation for play, sometimes perhaps unfairly described as the purposelessness of play (or the absence of the necessity to achieve a goal beyond itself), is generally seen as a defining characteristic (see Smith, 2010; Van Oers, 2013). Through play, children express themselves. Play and music are considered important vehicles for the development of children's mental capacity and intellect, and form a basis of language building (Linde, 1999; Greata, 2006). Youell (2008) states

that it is not just play, but the capacity to play that has significance for human development and learning. Children who cannot play are at a disadvantage when it comes to forming relationships and tackling new learning tasks. *"Play is, without a doubt, the most natural way children learn all over the world. [....] Play deepens children's learning and understanding because it enables them to begin learning from first-hand experiences, based on what they already know and can do"* (Moyles, 2011, p. 1). It is the internal, affective quality of play that is important in development: enthusiasm, motivation and willingness to engage (Forbes, 2004; Moyles, 2011; Smidt, 2011). Dewey (1993, p. 210) made the distinction between this internal, affective quality and play itself by differentiating between playfulness and play: 'the former is an attitude of mind; the latter is an outward manifestation of this attitude'.

This quick overview of the history of play conceptions illustrates the wide diversity of ideas about the value of play and the lack of a clear definition of play. Many teachers and academics have nevertheless picked up the notion of play as a basis for the innovation of classroom practices and have implemented it as context for children's meaningful learning. In this article, we will explore further the topic of musical play and the diversity of ways teachers and scholars have attributed value to it.

3.3 Musical Play

Looking specifically at music: music is inherently considered a playful activity, as is expressed in many languages, such as English, Russian, German, French, and Dutch. People *play* music, or *play* an instrument. One plays the drums, or can play in an ensemble. Are we just talking here about completely different meanings of the verb 'to play' in these different utterances, or is there a deeper connection with a psychological action to which this verb refers, comparable to the referent of utterances regarding playful activities in which (young) children purposelessly enjoy themselves and learn?

Marsh and Young (2006, pp. 289-290) defined musical play as:

"The activities that children initiate of their own accord and in which they may choose to participate with others voluntarily. Like other modes of play, these activities are enjoyable, intrinsically motivated, and controlled by the players. They are free of externally imposed rules but may involve rules developed by the children who are playing. They are 'everyday' forms of musical activity, happening in the places children inhabit when not engaged in organized educational, recreational, or economic activity. In these places, certain forms of musical play are possible, even encouraged by adults, and in others play may be severely constrained. The constraints imposed by space, the levels of acceptable noise, what might be used to produce a sound, and availability of others with whom to make music, all influence the ways in which children will play musically. Musical play is thus embedded in and blends across many features of its context."

Research into play raises the question of 'what is theoretically meant by musical play and what are the required conditions for its occurrence'. Moorhead and Pond (1941, 1942, 1951)

published a study of young children's spontaneous music making and provided some of the earliest pictures of children's creative music making and musical play. They reported that children, regardless of experience level or giftedness, were capable of creative musical thought, as long as they were given a rich, musically stimulating, and supportive environment. If children get the chance to play with musical materials, such as musical instruments, sound objects and toys, and the conditions for play are optimal, children will explore the possibilities of these materials within the extent of their current interest and abilities. According to Niland (2009), children have a natural inclination to sing and play, and these activities form a vital part of their musical development (Niland, 2009). The playful nature of singing is emphasized by Marsh (2008) as well. Campbell (2010) concluded that children play, dance, create and sing with their peers in everyday life. They develop their own repertoires of songs that are influenced by, but separate from, the surrounding adult world. Adults are often unaware of complexity, values and varied forms of children's musical play.

A large number of studies have shown musical play as a common feature of young children's experiences in music. Most studies focused on vocal activities (singing, chanting, and invented songs (Barrett, 2006; Gluschankof, 2008; Tarnowski, 1999; Valerio, Reynolds, Bolton, Taggart, & Gordon, 1998; Stadler Elmer, 2012). Music and movement (Gluschankof, 2006) and the use of instruments (Young, 2003) have also been studied. A number of studies have addressed questions regarding the possible effects of involvement in music on different dimensions of human development. Musical development, supported by engagement in musical play, is found to spur creativity (Adachi and Chino, 2004; Barrett, 2006; Campbell, 2010; Gordon, 2003; St. John, 2010; Lau & Grieshaber, 2010; Littleton, 1998). Furthermore, musical play increases children's musical skills (Niland, 2009) and generates social, emotional, and cognitive benefits (Tarnowski, 1999). According to Barrett (2011), musical play may also contribute to identity formation.

From a developmental point of view, Greenfield (1996) stated that play is fun with serious consequences. Play, and musical play in particular, is a form of human behavior that emerges after birth and continues during a person's whole life. This is the reason why composers/music educators such as Carl Orff and Zoltán Kodály used play-based teaching and learning strategies in their approaches.

Orff Schulwerk, as developed by Carl Orff and Gunild Keetman during the 1920s, combines music, movement, drama and speech in lessons that create an atmosphere similar to a child's world of play. Students learn new and often abstract musical skills in playful activities (Banks, 1982; Goodkin, 2004). Hereby four categories of activities can be distinguished: 1) Preliminary play in which students have guided experiences in spontaneous exploration of specific materials; 2) Imitation: Activities in which students accurately replicate a given pattern (echo response); 3) Exploration of applied suggested ideas; and 4) Improvisation: Based on pre-existing music, students invent original material/new music (Frazee, 2006; Frazee & Kreuter, 1987; Steen, 1992). Students experience music and participate in music activities in which not only musical concepts, sound aspects and musical structures, but also the aesthetic qualities of music play a part. *"Orff activities awaken the child's total awareness" and "sensitize the child's awareness of space, time, form, line, color, design, and*

mood-aesthetic data that musicians are acutely aware of, yet find hard to explain to musical novices" (AOSA.net, 2015).

Kodály became interested in music education in the 1920s. He developed a pedagogy based on a number of techniques, such as rhythm syllables and hand signs, some of which were adapted from existing methods. Starting point of the Kodály approach is the student. Skills are introduced in accordance with the capabilities of the student. New concepts are introduced through playful experiences in which listening, singing and movement go together. The playful activities start with what is easy for the student and evolve into more difficult activities (Houlahan & Tacka, 2008; 2015).

In order to emphasize the active nature of involvement in music, Small (1998) suggests interpreting the word 'music' as a verb: *musicking*. 'Musicking' refers to the active involvement in music activities (either listening to it, or playing it). In other words, the activity of actually doing music by active engagement. This can be interpreted from an activity theory point of

view. Playing the piano and playing a CD are both musical activities in a comprehensive way and are described as musicking. Taking this active (constructive) engagement in music into account, an interpretation of musical play from an activity theory perspective will be described below.

3.4 Towards an interpretation of (musical) play from an activity theory perspective

As outlined above, there has been, and still is, much discussion on what can be considered play, and what its relevance could be for human cultural development (see Singer, Hännikäinen, & Van Oers, 2013). From the point of view of Vygotsky's cultural-historical theory of human learning and development, Van Oers (2012 a and b; 2013) developed an activity theory interpretation of play that conceives of play as a particular way in which human activities may be carried out.

Activity theory is an expansion of Vygotsky's cultural-historical theory, accomplished by Leont'ev (1981). Leont'ev elaborated on the notion of activity that had already been touched upon in the works of Vygotsky and Marx. All human activities are collaboratively evolving products of cultural development, that become manifest in different cultural practices (like communicating, trading, educating, musicking, etc.). Children are educated to become self-dependent participants in cultural practices by appropriating the relevant tools and rules).

All cultural practices (and activities) can be accomplished in more strict and mechanistic ways or in more free and joyful ways. In the past century, the works of Lev Semënovič Vygotsky (1896-1934) has had an important role in the development of a vision on human development. Vygotsky, as an influential developmental psychologist, has been one of the most cited thinkers in social science for decades. Below we will argue how this approach influences the re-conceptualization of musical play.

An important starting point of Vygotsky's approach to play was his idea that all play is based on an imaginary situation (Fleer, 2010). Play, for Vygotsky and his colleague Leont'ev, closely relates to imagination (or fantasy), but they stress (see Vygotsky, 1978; Leont'ev, 1981) that play does not originate from imagination, but emerges in activities as children's way of relating to their environment (Diachenko, 2011). Imagination or fantasy, according to Vygotsky and Leont'ev, is a product of playing and not the origin of play. But what is meant by the notion of 'imaginative situation' that is inherently associated with play, according to Vygotsky?

3.4.1 Imaginative Situation

Vygotsky rejects the idea that play can be defined as child behavior that does not focus on a specific goal. From his point of view, play always forms part of a social situation in which the actions of children are emotionally related to the material situation itself by an imaginative representation of the situation in the mind of the child. Vygotsky (1984, p. 348) defines play as follows: *'Play is the specific relation [of the child] with the reality, characterized by the construction of an imaginative situation, or by the transfer of properties of one object onto another'*. Although Vygotsky himself is not very specific about the precise meaning of this imaginative situation, it is reasonable to interpret it as the imagination of the demands and the activity potential in a social situation. Hence, Vygotsky connects the child's play with the child's (or the player's) imagination of what can be done in a given situation. By being engaged in cultural activities with others, the playing child creates his interpretation of the situation in terms of possible action potential and demands. Nowadays, we would talk about the child's acknowledgement of the 'affordances' of the situation (Van Oers, 2011, p. 41).

The imaginative situation, as we interpret this notion here, is the interpretation of a cultural situation in terms of an activity that can be accomplished, and in terms of the specific actions that can be carried out within that activity context. This imagination emerges and develops in the course of an activity and includes both well-known actions and new action potential, i.e. possibilities for action that are new to the child (player) and often require help from more knowledgeable others (like peers or adults). However, the accomplishment of an activity can take different forms, depending on the personal mood or ability of the player, or on the situational or cultural constraints that may impose strict (or loose) norms of how the activity is to be carried out (imagine, for example, how young children can or are permitted to use a pen and a piece of paper in an elementary school classroom, or how young children are instructed to manipulate Orff instruments). According to Van Oers (e.g. 2012a), the way in which an activity is accomplished can be characterized as an activity format that is defined by three parameters (rules, involvement, and degrees of freedom). It depends on how the parameters are substantiated in a specific setting as to whether an activity will be experienced or interpreted as play.

3.4.2 The activity format as a way to characterize play

From the perspective of cultural-historical activity theory, we conceive of play as a *mode* of activity, defined by the three parameters of the activity format. Below we will describe each of the defining parameters of play, which will ultimately be used to define musical play specifically in the next section (4.3). It is important to keep in mind that the parameters are only described separately here for the sake of clarity. Actually, they are attributes of activities and should not be seen as subcategories of activity.

3.4.2.1 Rules

By participating in social-cultural practices, children are confronted with all kinds of rules (Vygotsky, 1982; Veraksa, 2011). Leont'ev (1983, p. 315) notes an indissoluble relationship between roles in play and rules of play. Some of them are implicit and included in the social practices the child participates in, for instance musicians start playing when the audience is silent and the audience starts applauding when the piece is over. By getting children engaged in such cultural practices, opportunities will be created for them to incorporate these practices (and the implied social rules) in their role-play. There are also explicit technical rules dealing with the instruments used that are controlled in more or less perfect ways. The possibility to use role-play as a meaningful context for learning is based on Vygotsky's view of play, which incorporates the underlying wish of children to follow the rules of play, and accept help of a knowledgeable person, if necessary.

Many psychologists have noticed the essential meaning of rules for play activities. Important developments in play activities are often associated with learning to use explicit and increasingly complex rules (Piaget, 1951; Leont'ev, 1983; El'konin, 1978; Gray, 2013). As a consequence of the emphasis on rules in role-play, Vygotsky rejects the possibility of free play (Vygotsky, 1978, p. 103), as all activities imply social, technical, conceptual and/or strategic rules, which may be inconsistently applied or handled very loosely or idiosyncratically. Rules are constitutive for specific socio-cultural activities and by definition also constrain freedom to a certain extent. Play is a partially rule-defined arena that allows the player considerable freedom of action.

3.4.2.2 Degrees of Freedom

The inevitable presence of rules in play activities does not mean that there is no possible allowance of a certain degree of freedom for the participants of an activity. Real human activities mostly cannot be interpreted merely as a process of strict application of rules. Human activity is a part of life and therefore also has – for Vygotsky –an essentially creative moment (see Vygotsky, 1991/1926, p. 367-368; 1997/1926, p. 346-347). Particularly in play, a certain degree of freedom is an essential feature. When the actions of the player are completely externally determined and thus are predictable, the activity will not be recognized as play by the actor, or by its environment. The degrees of freedom give players the right to make their own (idiosyncratic) versions of a socio-cultural activity.

In his analysis "The psychology of the art", Vygotsky (1968) established a link between arts and play, particularly in terms of the freedom both forms of expression have to some extent. This freedom is present in the interpretation of the meaning of symbols (for example, the words), the imagination of the fictitious situation, the choice of means and goals, etc. It is this conditional freedom that is so characteristic for life as a "creation", and that belongs to the essence of imitative participation in everyday practices that constitute life (Van Oers 2012b). Creativity and imagination are crucial elements that can only exist by the grace of a certain degree of freedom in combining and giving meaning to the culture that someone encounters in his or her environment (Vygotsky, 1967). He again establishes a link between play and the creative possibilities of the child (see also Connery, John-Steiner & Marjanovic-Shane, 2010).

3.4.2.3 Involvement

In his analysis of the meaning of the environment for human development (see Vygotsky, 1994/1935), Vygotsky inquired as to how the environment influenced the development of children. This is not a process of direct adoption of information from the environment, but the building of a profound emotional experience of the environment, and building an empathic relationship with this environment and the activities that occur in that setting (Mahn & John-Steiner, 2002, p. 49 – 50). Such an experience develops in a unique relationship that the child has with the situation and only in this relationship can the influence of the environment be understood (Vygotsky, 1994/1935, p. 339). In this experience, the environment is represented by the actor in a certain way, both with regard to the content and *how* this environment is personally experienced (Vygotsky, 1994/1935, p. 342). Also with regard to play, Vygotsky noted this intense personal involvement which is based on the child's own imagination of the situation and the play activity (Vygotsky, 1984, p. 348).

3.4.3 The definition of musical play from a cultural-historical point of view

Applying the activity theory for the interpretation of human practices reveals a number of different modes of activity. Traditional forms of music education that focused on training for strictly rule-regulated performances (of songs or instrumental pieces) with very limited freedom for the player to vary the performance and express a personal version of the music, can be seen as essentially reproductive forms of music education in a narrow sense. This approach to music education is diametrically opposed to educational activities that engage students in musical activities which respect some rules (acknowledged by students), allow them some freedom in interpreting the rules and in representing the melody (as to tempo, articulation, phrasing, etc.) according to their own (aesthetic) preferences. This latter type of music education can be seen as productive and playful. It is, however, important to note here that the distinction between reproductive and productive styles should not be seen as absolute and dichotomic. Expert performances of codified music can be seen as a form of reproduction, but under special conditions such music can be accomplished with a high level of engagement and serious obedience of musical rules, but still expressing the personal freedom of the performer as to dynamics, phrasing and so on. In this sense, it abides by the basic characteristics of play, seen as a specific activity format.

In the rest of this section, we will focus specifically on musical play from our activity point of view, and detail some of its implications for productive music education practices. As said before: *"Musical play is [...] embedded in and blends across many features of its context"* (Marsh & Young, 2006). Musical play can manifest itself in all kinds of social-cultural activities that involve music. These activities vary from music listening to performing music and music composition and improvisation. The wish to appropriate cultural tools used by adults is an important incentive for children's play (Janssen-Vos & Pompert, 2012), including musical play. Challenging music activities are mostly open activities that place high demands on children and bring them into contact with both cultural and academic achievements of today's life. As such activities tend to be complex, play is an eminent way for children to get access to them, for it allows them to create their own versions of this complex activity within certain social, or technical constraints. Such activities take the needs of the participants into account (Levine, 2002), and allow exploration and inquiries.

In many other domains, music education can, in our view, make a step from a reproductive approach to a more productive one. Instead of rigidly following pre-defined instructions and reproducing codified music composed by others, students can be actively involved in the construction of objects relevant in music education, such as aspects of sound and form, and skills for playing instruments. The use of the activity format of play can be useful for clarifying this paradigm shift. In (complex) music activities, students can feel the need for new skills and actively produce musical skills and knowledge by creating their own music(s) with the help of experts (Hogenes, 2012). It is exactly the playful accomplishment of such complex activities that provides the children with the acknowledged rules and the freedom to make their own versions of these activities. Engagement in such playful activities with experiences of success and satisfaction may lead to the formation of a person's disposition to participate in activities in ways that are rightfully characterized as play. The development of this 'playfulness' is also deemed important for musical development, using 'composition', 'creativity' and improvisation as core activities.

Composition, creativity, and improvisation are words that are often used interchangeably, which can make discussions on this subject diffuse (Kors & Van de Veerdonk, 2006). Both composition and improvisation can be creative processes (Kiehn, 2003). However, they can also be taught in a very uncreative way. The difference between composition and improvisation, according to Kratus (2012, p. 372), is that the act of composition allows time for reflection, development, and revision of the final product, while the act of improvisation does not. He notes that improvisation is sometimes defined in terms of composition, as simultaneous composition and performance. Kratus (2012) argues that we should define composition in a more accurate way in terms of improvisation, i.e. as improvisation that allows time for reflection, development, and revision.

An improvisation, however, is a section or a piece that is invented spontaneously. It is created in real-time, but not formalized, refined, or repeated. Therefore, it is never written like a composition. However, improvisation can be the first step in the composition process. Instant composing is a form that is between composition and improvisation. It combines (group) improvisation and the performance of reproducible parts. Improvisation exercises are used to create musical materials that can lead to a music composition made by students and a music leader/workshop leader (Connect, 2005; Frowijn & Tomassen, 2007; Green, 2008).

Studies on children as composers and improvisers are abound in literature; researchers have typically examined either the process or products, or examined both (Barrett, 1996; 1997; Burnard, 1995; 1999; Delorenzo, 1989; Folkestad, 1996; Folkestad, Hargreaves, & Lindstrom, 1998; Freed-Garrod, 1999; Henderson, 2007; Kaschub, 1997; Kratus, 1989, 1994, 2001; Miller, 2004; Ruthmann, 2008; Stauffer, 2001, 2002; Wiggins 1994; Wilson & Wales, 1995). However, although there is a strong belief in the value of creative activities for all children, and in music composition in particular, composing music is still not a regular classroom activity despite all attention that has been devoted to the topic over the last 30 years.

Although there are many music activities that allow for playful versions, we argue here that *music composition* activities in particular follow the play format of activity and offer children opportunities to create their own music, as well as in *improvisation*. The characteristics of the

play format (rules, degrees of freedom, involvement) are clearly visible in music composition and improvisation as social-cultural activities. As children may create their own music of their own accord, children are usually highly involved in this activity (by definition). In the course of their composing and improvisation activities they follow some rules, for example conceptual rules with regard to musical content like musical form and organization, technical rules (for the use of the instruments), social rules for the division of the musical roles, etc. Children are allowed to interpret the rules their own way, for example the choice of instruments they use and the kind of musical notation they think is most suitable for their composition. Involvement, for example, is manifest in children's wish to continue participation in the music activity. Encouraging and supporting children to improve their participation in cultural activities like music composition and improvisation, confronts them with new needs and demands for learning. This is especially the case with regard to tools for communication (language and expression) and representation (notation).

Language and notation, as cultural artifacts, play important roles in composition activities. Musical literacy, the ability to hear what is seen and see what is heard, will be stimulated when the musical environment of children shows that musical notations are prominent elements for their musical activities. Children are curious about artifacts used by adults. Participating in social-cultural activities, like music making and music composition, offers children opportunities to explore these artifacts and use them for their own benefits. Moreover, writing music and texts is an important inspiration in the process of thinking and reflection. Literacy has become a feature of our culture. Musical literacy, the ability to read, write, comprehend and interpret staff notation (Mills and McPherson, 2006) and other forms of musical notation such as graphic notation, may yield a major contribution to the understanding of music. It therefore became one of the characteristics of a developmental music education program (Hogenes, 2010).

Cooperative learning can be used for music composition activities as well, particularly when an expert is involved. Based on the activity format of play, Hogenes (2010) developed a three-step-model for playful classroom music composition activities. In this model, the first step for promoting collaborative music composition activity in students consists of creating a common base. This base is related to the concept of 'common knowledge' (Edwards and Mercer, 1987; Mercer, 1995). Common knowledge refers to the construction of knowledge as essentially a social process, producing common ground for successful joint activity. In joint playful activities (like composing), children will also need to build this shared pool of knowledge, experiences and objectives, for solving the problems they encounter while accomplishing the composition activity. However, it is important to note here that in joint musical activity children do not (only) work together to have fun; they work together to benefit from this cooperation for making their music.

3.5 Conclusions and discussion

This article explored the possibility of conceiving of musical activity as play and particularly focused on the question: "*How can musical activities with children be conceptualized as playful activities that establish optimum conditions for (musical) learning outcomes?*"

From the perspective of Cultural-Historical Activity Theory, we could answer this question in the following way: play can be conceived of as a way of carrying out human activities. All human activities can be accomplished in more strict and mechanistic ways or in more free and joyful ways, and the same can be said of music activities. Musical play is a mode of activity defined by the three parameters of the activity format: rules, degrees of freedom, and involvement.

Traditional forms of music education that focus on training for strictly rule-regulated performance can be seen as essentially reproductive forms of music education. Educational activities, on the other hand, can be considered productive and playful when they succeed in engaging students in musical activities that relate to their interests, build on rules that can be acknowledged by the students, and allow the students freedom in interpreting the rules and the forms of performance. Like in many other subject matter domains, music education can make a step from a reproductive approach to a more productive one. Although there are many music activities that allow for playful versions, we argue here that *music composition* activities in particular follow the play format of activity and offer children opportunities to create their own music.

Music composition can be offered as a playful activity in elementary schools. Children are able to, and want to, participate in such activities and actively appropriate musical skills and knowledge while creating their own music composition(s). However, they need assistance to improve their ability to participate in cultural practices, like music composition.

The music composition process is conceived of as a planned, deliberate realization of a creative process with a new piece of music as the outcome (Hogenes, Van Oers & Diekstra; 2014). Pedagogical implications of music composition as a regular playful classroom activity are that the participating and guiding expert (teacher) should never impair the quality of the activity as play, i.e. the expert should abide by the characteristics of the activity format of play – rules, degrees of freedom, and intense experience. A pedagogical model can be used consistently with this play-based approach as a three-step-model, in which step 1 is the creation of a common base, step 2 is creating ideas and writing the composition, and step 3 is the presentation and publication. An important part of the process is the revision phase, part of step 2. In this phase, the teacher focuses on the goal of making students think about their compositions and helping them improve their compositions.

Using the developed model for music composition, every classroom teacher should be able to work with students on music composition. It offers classroom teachers tools to motivate, stimulate, and facilitate students in working on challenging assignments, which offer students insight into musical concepts and help them to develop musical skills. The presumed potential of this pedagogical model is that it can enhance meaningful musical learning in elementary school students. The validity of this theory-based claim can only be verified by further empirical research in which the model is implemented in everyday elementary classrooms.

Further elaboration of the approach presented in this article requires the development of specific models that may support elementary school teachers in introducing more constructive

music making activities in their classrooms. Music composition by children can be conceived of as a form of role play in which the participants can adopt roles of composer, performer, audience, etc. These roles may raise the need for special skills and knowledge in order to improve the accomplishments of these roles.

When music composition is introduced in the classroom as a playful shared activity, classroom teachers and music specialists as more knowledgeable partners of children can participate and motivate, stimulate and facilitate students in working on challenging compositions. This contributes to students' insight into musical concepts, and development of musical skills. However, further research should be done to create and test models of music composition with children in the elementary school age. ■

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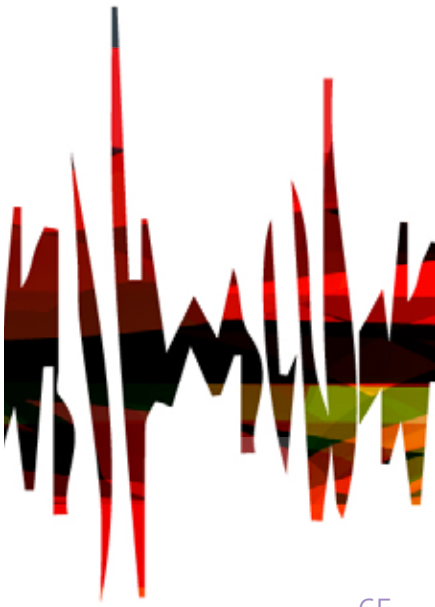

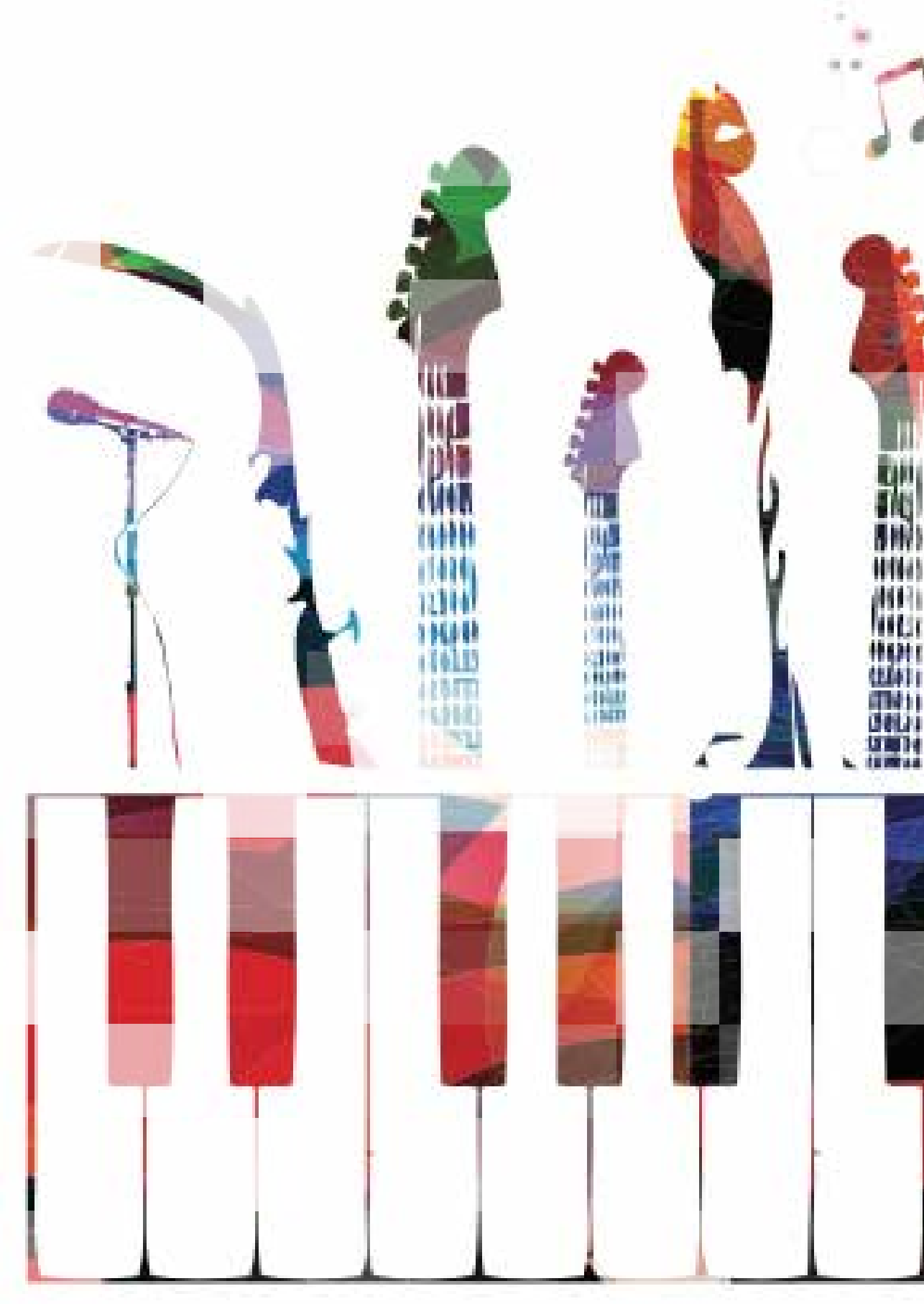

MUSIC COMPOSITION IN THE MUSIC CURRICULUM

Abstract

In contrast to other arts subjects, music education focuses foremost on the re-production of music, rather than the production of their own pieces of art. This article is a theoretical study, in which the possibilities to regard children as composers are explored. Three research questions are inquired: 1. What is music composition? 2. To what extent does music composition require the mastery of music notation and creativity? and 3. What are the pedagogical implications of music composition as a regular classroom activity? It is concluded that an activity theory interpretation of music composition and creativity can provide a productive basis for the implementation of music education in elementary school classrooms. A three-step-model was described for engaging and assisting students in collaborative composition activity. The authors argue that, with the help of this model, every classroom teacher should be able to work with students on music composition. It offers classroom teachers tools to motivate, stimulate, and facilitate students in working on challenging assignments, which offer them insight in musical concepts and develop their musical skills.

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4. MUSIC COMPOSITION IN THE MUSIC CURRICULUM

4.1 Introduction

Although music is everywhere around us and is also easy to attain from of computers, tablets, and mobile phones, the number of children that is active in music making lags behind the number of children that solely listens to music (Hogenes, 2012a). Since the inception of convent schools in the 18th century, singing is an activity that takes place in schools. However, music as a school subject in elementary schools includes, in addition to singing and playing instruments, the domain of active listening. Music notation, music and movement, and talking about music are derived from making music and/or listening, but can also be regarded as independent domains, like music-making and listening.

Looking closely at the domain of music-making, it is evident that music is mostly re-produced in schools, while in other arts subjects (like visual art, dance, drama, and literature), creation or production plays an important role. Music composition executed by children themselves is not a regular classroom activity in most music education practices in elementary schools. Classroom observations showed that students like to sing songs written by songwriters and also like to play pieces written by composers (Hogenes, 2010a). They enthusiastically perform music and are interested in the music that is offered to them. But why not introduce music composition as a classroom activity and regard children as young composers?

The comparison of music education with other arts subjects raised the question whether an approach of music education, in which music composition, as a practice of playful music-making, plays a key role, can also be implemented in elementary schools in ways that make sense to the students. The main question addressed in this article is: How can elementary school students be meaningfully engaged in music composition activities? In order to answer this question, three preliminary questions should be answered first:

1. What is music composition?
2. To what extent does music composition require the mastery of music notation and creativity?
3. What are the pedagogical implications of music composition as a regular classroom activity?

In this article, we will bring different theoretical fields together in order to develop an approach to music education that concentrates on “composing” as a core activity, and that is relevant for elementary school teachers. Our theoretical framework with regard to learning and development will be the cultural-historical activity theory of Vygotsky and Leont’ev.

4.2 What Is Music Composition?

The word "composition" refers both to a process (the act of making up music) and a product (the resulting music) (Kratus, 2012). A composer is the person who creates new pieces of music. The word "composer" derives from the Latin words "com" and "ponere", which literally means "one who puts together". Composing music can be done by using musical notations or from an oral tradition. Music composition can be conducted for interpretation and performance, or through direct manipulation of sonic materials. The roles of composers and performers can be distinct, but can also be merged. Barrett (2003) described the composition process as an intensely personal process of meaning-making (Bruner, 1986), and with regard to children's meaning-making in the domain of music, she wrote:

"Musical meaning-making is an accomplishment of the child who—as musician and composer—is engaged in a dialogue with self and the emerging musical work, a dialogue that is mediated by the culture. The constant dialogue—among the roles of composer, critical listener, and performer—forms the heart of musical meaning-making" (pp. 23-24).

The words "composition", "creativity", and "improvisation" are often used interchangeably, which can make discussions on this subject diffuse (Kors & Van de Veerdonk, 2006). Both composition and improvisation can be creative processes (Kiehn, 2003). It should be added, however, that both activities can also be taught in a very uncreative way. According to Kratus (2012, p. 372), the difference between composition and improvisation is that the act of composition allows time for reflection, development, and revision of the final product, while the act of improvisation does not. Kratus (2012) noted that improvisation is sometimes defined in terms of composition, as simultaneous composition and performance. He pleaded to define composition in a more accurate way in terms of improvisation, i.e., as improvisation that allows time for reflection, development, and revision. In this study, we define composition as a planned and deliberate realization of a creative process with a new piece of music as the outcome (Campbell & Scott-Kassner, 2006). However, there are also other, sometimes more specific, definitions of the word "composing". Berkley (2004), for example, described composing as knowledge-rich, complex, multiple, and creative problem-solving, requiring the development of skills of hypothesis and verification in students. Berkley (2004) stated that teaching composing is characterized in the main activities of instruction and training in composing skills and knowledge, management of a positive and creative learning environment, and facilitation of ownership, autonomy, and authority in students. She concluded that conceptualizing teaching composing as problem-solving enables music educators to rationalize the specific demands of the curriculum context, in which they are operating by providing students with a framework for cognitive development in composing.

An improvisation, however, is a section or a piece that is invented spontaneously. It is created real-time, but not formalized, refined, or repeated. Therefore, it is never written like a composition. However, improvisation can be the first step in the composition process. Instant composing is a form that is between composition and improvisation. It combines (group) improvisation and the performance of reproducible parts. Improvisation exercises

are used to create musical materials that lead to a composition made by students and a music leader/workshop leader (Connect, 2005; Frowijn & Tomassen, 2007; Green, 2008).

Studies on children as composers are not absent in literature; researchers have typically examined either the process or products of composition, or examined both (Barrett, 1996; 1997; Burnard, 1995; 1999; Delorenzo, 1989; Folkstad, 1996; Folkstad, Hargreaves, & Lindstrom, 1998; Freed-Garrod, 1999; Henderson, 2007; Kaschub, 1997; Kratus, 1989; 1994; 2001; Miller, 2004; Ruthmann, 2008; Stauffer, 2001; 2002; Wiggins 1994; Wilson & Wales, 1995). However, although there is a strong believe in the value of creative activities for all children, and in music composition in particular, composing music is still not a regular classroom activity despite all attention the topic has had over the last 30 years.

As said, many researches have been devoted to composition processes. Wallas (1926) distinguished four stages of the composition process: preparation, incubation, illumination, and verification. These stages have been quoted in more recent literature (Hargreaves, 1986; Kennedy, 2002; Kratus, 1989; Sloboda, 1985). Webster (1990) used Wallas' four stages in the construction of his theory of creativity. Sloboda (1985) restricted the process of composition to two stages: inspiration and execution. Both stages involve conscious and unconscious operations. Emmerson (1989) constructed two models based on his experience with electro-acoustic music. The first and simplest model consists of three phases: (a) action (to create/combine sounds); (b) test (listen and determine whether the sounds sound good together); and (c) accept (store) or reject (modify as new action). His second model includes three new steps: new action, action repertoire, and reinforcement. These supplementary stages allow composers to use either rule-oriented (conscious/learned) or intuitive (unconscious) bases for decisions made as a result of the test phase (Kennedy, 2002). An approach popular in the Netherlands is the Guildhall approach adopted from the Connect Project by the Guildhall School for Drama and Music in London. The Guildhall approach uses five steps in the the process of composing: warm-up, interpretation, composition, improvisation, and performance (Connect, 2005).

Research has also been done on composition processes in specifically professional composers. Bennett (1976) interviewed eight professional composers and identified six stages: germinal idea, first sketch, first draft, elaboration and refinement, completion of the final draft, and score copying. Hung (1998) researched the processes of 16 Taiwanese composers and reported several successful approaches: listen-analyse-compose; listen-play-compose; receive stimulation-introspect-breakthrough; and sense/observe-imagine-express/create. Hung (1998) concluded that mastery of composition relies on persistent effort and an accumulation of experience. He also concluded that there is no standard compositional procedure.

These studies described above show that music composition, as a form of music production, is a complex activity that can be executed by both adults and children and has many appearances. It is a planned and deliberate realization of a creative process with a new piece of music as the outcome. In the text below, we describe how classroom teachers and music specialists can organize this process.

4.3 To What Extent Does Music Composition Require the Mastery of Music Notation and Creativity?

4.3.1 Music Notation

It is a misconception that composition always concerns "writing of music". Musical repertoire of non-Western countries can be good examples of the rejection of this misconception. Much popular music is also not written down. Music notation is often used as a means to facilitate the reproduction of a music composition. This music notation does not necessarily have to be modern staff notation. It can also be written down with, for example, graphic notations. However, the forms of music notation are often needed for the music composition process.

Not only general classroom teachers, but also music educators often debate the use of music notation. Should children learn to read a music score or not? Is musical literacy as important as "normal" literacy and numeracy? Although researchers still debate the best methods and techniques for teaching children to read language, they agree that language reading could be best achieved through speech, after the basic structure and vocabulary of the language have first been established (Cooper, 2003; Tomasello, 2003). In music education, the first steps of the musical literacy process (listening to sounds and music and active music production by singing) are often neglected, or children are not given enough time to establish a basic structure and vocabulary in music (Hogenes, 2010a). In analogy to the functions of composing texts (i.e., to write down a person's thoughts coherently and to structure ideas and form meta-cognition) (Vygotsky, 1978), basic musical literacy can also be considered useful in the process of music composition. Musical notation, then, is not only used to make other people perform a composition, but also used to reflect on one's own composition.

Bruner (1964) introduced three modes of representation: enactive representation, iconic representation, and symbolic representation. For enactive representation, Bruner meant a mode of representing past events through appropriate motor response. A simple musical example of this kind of representation is a young child shaking a rattle. The child represents a past event through motor response. Although the rattle might have fallen or removed, the child makes the shaking movements, as if the movement itself produce the accustomed sound. Iconic representation is the first step to the use of abstract signs. Iconic representation is where information is represented visually in the form of images. Graphical notation of music is a form of iconic representation. The use of traditional staff notation is a form of symbolic representation. This is where sounds are stored in the form of codes and symbols, like the function of written language (Vygotsky, 1978).

Barrett (1997) studied the use of idiosyncratic symbols (invented notations) of young children to encode their composition experiences. Barrett viewed these symbols as vehicles for conveying meaning and precursors to the development of culturally agreed symbol systems of the adult literature world. The outcome of the study suggested that as children become more experienced in encoding their responses, their recordings become less context-bound and more concerned with ideas and concepts.

In the coda of a study on musical literacy conducted by Mills and McPherson (2006), the authors noted:

"In the final analysis, it is important to acknowledge how many children learn to read staff notation and achieve a level of proficiency that enables them to function musically. Equally, however, many children are failed by the ways in which they are taught to read music, and give up playing completely. Reading staff notation is not a prerequisite for successful engagement with and appreciation of music, and exclusive concentration on reading has held back the progress of countless learners, while putting many others off completely" (p. 169).

Despite this strong warning of Mills and McPherson (2006), Hogenes (2010b) stated that musical literacy will emerge in music activities when the musical environment of children shows that music notation is an integral part of this musical environment and is useful in executing these activities. Observations show that children are curious to the artifacts used by adults (Vygotsky, 1978). Participating in social-cultural activities, like music-making and music composition, offers children opportunities to explore these artifacts and use them for their own benefits. Adults/teachers can challenge children to participate in meaningful musical activities, in which musical notation can play a major role.

Music notation in the process of music composition as a classroom activity is a useful means to let children coherently write down their thoughts and to structure their ideas. Moreover, they can use music notation for meta-cognitive processes, such as planning, monitoring, and evaluation. It is one of the tools that they can use to reflect on the music they composed.

4.3.2 Creativity

Musical literacy is often conceived as a collection of technical skills necessary for music-making. Western classical performing musicians have developed their literacy skills through childhood instrumental lessons that addressed instrumental skills, music reading skills, and related skills as part of the same package (Mills & McPherson, 2006). Like music composition, musical literacy can be taught in an uncreative way, for example, by teaching the duration of notes as if mathematics, without a musical context. How can these skills be developed is a more creative approach.

Moran and John-Steiner (2003) described Vygotsky's (1978) ideas regarding the development of the creative imagination over the lifespan and the role of creativity in cultural development. Like play does for children, creativity creates a lifelong zone of proximal development for adults to continually learn from and contribute to their cultures. It helps people actively adapt themselves to the environment and modify the environment to themselves: "The dialectical approach, while admitting the influence of nature on man, asserts that man, in turn, affects nature and creates through his changes in nature new natural conditions for his existence" (Vygotsky, 1978, p. 60). Through such interaction, creativity actualizes inherent and latent possibilities of people and environments; it not only broadens what we singly and collectively have done, but also what we can and may do. It allows people to step out of the present moment, reflect on the past, and plan future behaviors; it connects us to what could be, or can imagine to be. Through the development of creativity, a person comes to be a flexible and

intentional inventor of his/her personal future and a potential contributor to his/her cultural endowment. Creativity is not a priori stable property of only special people, but a positive and essential capability of all healthy-functioning individuals. It transforms both the creator through the personal experience of the process, and transforms other people via the creation of knowledge and innovative artifacts propagated through the culture to be appropriated by others. Creativity is both the goal and the means of personal and cultural development (Moran & John-Steiner, 2003, pp. 63-64).

A substantial body of literature on creativity and musical creativity in particular is available (Beghetto & Kaufman, 2010; Binkley, Erstad, Herman, Raizen, Ripley, & Rumble, 2010; Craft, 2001; Elliot, 1995; Gardner, 2007; Hargreaves, Miell, & MacDonald, 2012; National Advisory Committee on Creative and Cultural Education (NACCCE), 1999; Webster, 1987; 1990). However, the expression "musical creativity" is interpreted in many different ways. Creativity in general is described as the ability to generate something new (unusual, unique, offering new perspectives, varied, original, different from the usual, and pattern-breaking) that has value (useful, effective, efficient, and addition to the society) (Ten Hoonte, 2009). There are also descriptions of creativity, though, that do not require originality and/or something completely new, but rely on what is already in place (Karkou, 2012). Karkou and Sanderson (2006) defined creativity as the capacity to find new and unexpected connections, new relations, and therefore, new meanings (adapted from Stanton-Jones, 1992; Smitskamp, 1995). Burnard (2012) stated that: "musical creativity—broadly constructed as the exemplary locus of diverse forms of practice—is one of the most prominent yet notoriously contentious phenomena produced in the field of music education" (p. 319).

Webster (1990) developed a specific theory on creative thinking in music. This theory includes three qualities of divergent thinking: (a) musical extensiveness (the number of ideas that are generated); (b) flexibility (the ease with which students shift between musical parameters); and (c) originality (the uniqueness of musical ideas). The three qualities described above interact with others, like children's musical understandings, sensitivities, and abilities, such as to imagine pitches and rhythms, aesthetic sensitivity, and the ability to craft a piece to effect the final product of the creative effort.

As illustrated above, the expression "musical creativity" is interpreted in many different ways. Elliot (1995) made a clear distinction between the concepts of creativity and originality. For Elliot (1995), creating is "a particular kind of making or doing that results in tangible products or achievements that people deem valuable, useful, or exceptional in some regard" (p. 216). Originality, however, is achieved when a work of art is "simultaneously similar to, yet different from, its relevant ancestors" (Elliot, 1995, p. 217). It is not the sole determiner of creativity; the product or achievement's significance to its domain is of equal importance (Brophy, 2000).

The question whether musical creativity is required for being involved in music composition can only be answered in relation to composition activities/assignments given to students. As said before, music composition can be taught in a very uncreative way, like music composition as a closed assignment. The intention of the authors of this article is to regard students as young composers, not as executors of assignments. Children are creative beings, and appropriate conditions that facilitate children's potential to generate new ideas and retain

some of them for further elaboration have to be realized in classrooms. Sometimes, however, their creativity may have to be stimulated, for example, when children are not used to be involved in creative activities or their initiatives are not appreciated by adults/teachers.

4.4 Towards a Cultural-Historical Activity Theory Interpretation of Music Composition

How do we create meaningful music activities for elementary classrooms? Leont'ev (1981; 1983) described meaningful education as a form of education, in which two elements must be distinguished: cultural meaning (the cultural value) and sense (personal meaning and value in the light of personal motives and interests). In meaningful music activities, students build a repertoire of cultural knowledge and skills with respect to a subject to learn, for example, composing music or playing flute, and connect this with personal interests and values (sense). Teachers offer professional (culturally accepted) tools to students that can be made personally relevant for these students. Meaningful (music) learning is fundamental for learning that aims to promote broad cultural development and agency. Learning is only meaningful for children when it makes sense to them and actually contributes to their potency of action (Van Oers, 2012a, p. 19).

Children potentially have huge developmental potentials. However, they need assistance to improve their abilities for participation in social-cultural practices. For young children, play is an important mode of participation in social-cultural activities (Vygotsky, 1978; Van Oers, 2012a). The desire of children to be part of and to participate in the world of adults is their incentive for development and learning. In their play, they can do this because they have freedom to imitate adults' activities in their own way.

In line with the thoughts of Vygotsky (1978; 1982; 1997), El'konin (1978; 1989), Leont'ev (1981; 1983), etc., play can be characterized as a specific mode of human activity, defined by determinants that form the activity format of play: rules, degrees of freedom, and intense involvement and experience (Van Oers, 2013). As can be observed in meaningful activities for older children and adults, the activity format of play can be used for all age groups (Aldrich, 2009; DeRose, 2009; McFeetors & Mason, 2009; Kaufman & Sauve, 2009; Piu & Fegola, 2010). The authors of this article used the format of play to develop the concept of music composition activities (Hogenes, Van Oers, & Diekstra, 2012).

4.5 Music Composition as a Regular Classroom Practice-Design of a Teaching Strategy

Referring to the approaches described above (Frowijn & Tomassen, 2007; Connect, 2005; Green, 2008), one can ascertain that these approaches fit the characteristics of the activity format of play: rules, degrees of freedom, intense involvement, and experience. Music composition can be a meaningful tool for music education in schools. Given the (Dutch) situation that only few schools have music specialists, the question is how to create a usable

strategy for the implementation of music composition as a regular classroom activity that can be conducted by classroom teachers.

Within education, based on the cultural-historical activity theory, "broad development" of children is an important issue besides the development of specific knowledge and skills needed for making or understanding music. Broad development is meant a multi-faceted person formation ("Bildung") that leads to an increasing self-reliance of a participant involved in cultural practices. Looking at the key subject "reading and writing", in cultural-historical curricula, one can note that children deal with the concepts of main ideas, sequencing, classification, and categorizing (Pompert, 2004). Composing music in elementary schools can also assist students to gain control over these intellectual strategies by brainstorming (in groups and as individuals), writing rough drafts, editing and revising, and creating finished products (Wiggins, 1990). Like in many other subject matter domains, music education can make a step from a reproductive approach to a more productive one. In the activity of music composition, we see children brainstorm, write draft versions of music, and adjust and revise compositions in order to get a presentable result. Perlmutter's (2010) classroom observations confirmed this point of view. She noticed that students love to create and to be involved in improvisational activities. Composition and improvisation help them show what musical concepts they understand from what they are told during the lessons. Wiggins (1990) offered four reasons to compose music with children: 1. Children have a congenital creativity. They are proud of their own creations and have fun in making these, which stimulate their motivation; 2. Composing music can support children to become proud of their musicality; 3. Composition is an excellent didactical tool to teach musical concepts and to reinforce pre-existing ones; and 4. The analysis of children's compositions offers teachers insights in developing understandings of musical concepts.

4.5.1 A Composition Process in Three Steps

Building on previous analyses of music composing activity and taking into account that general classroom teachers should be able to conduct music composition as a regular classroom activity, we adopted and adjusted a model for text composition that is used in Dutch schools for cultural-historical education for the core subject "reading and writing" (Pompert, 2004). We adapted this three-step-model for composing music (Hogenes, 2012b):

1. Creation of a common base;
2. Creating ideas and writing the composition;
3. Presentation and publication or recording; How these three steps are implemented in music education is described below.

4.5.1.1 Step 1 - Creation of a common base

Based on the concept of "common knowledge" (Edwards & Mercer, 1987; Mercer, 1995), the first step in our three-step-model for music composition in schools starts with the creation of a common base. Common knowledge refers to the construction of knowledge as essentially a social process. It is important for children to know the usefulness and necessity of writing a text and to have an idea of ways to write this text. Just like for text

composition, these issues also play a major role in composing one's own music. Although most people are daily confronted with music, but not everyone is aware of what they hear. This is what marketing people make advantage of, or what is used to make people feel at ease in elevators and train stations. It is also used to chase young people away with classical music because they prefer other kinds of music, and to, for example, communicate meaning and further the narrative in a film (Juslin & Sloboda, 2001, p. 258).

Music (sounds, putted in a form, and having meaning for humans) consists of three aspects: sound, form (musical structures), and meaning (Lei, Haverkort, & Noordam, 2010). Composers can use these aspects in order to create a piece of music. For the formation of a composition, it is necessary to bring form into the sounds that are available to a composer. For this, three aspects of form are available: repetition, contrast, and variation. The third aspect of music—meaning, has two different specifications: (a) the function of music (dance music, music to march on, etc.); and (b) emotions. Although one piece of music can generate different emotions in different people, a composer uses certain sounds and forms to create, for example, energetic music or exciting music.

To get children composing their own music, it is necessary to give them some input. Just giving them an assignment is not enough to get started in most cases. There has to be an incentive to start composing music. Building a common basis around an interesting theme in which the children do feel the need to compose their own music and to write it down is very important. Working on a common theme, such as spooky music, film scoring, radio play, etc., can do this. Starting the composition process with a recorded or a written composition or a drama activity may also serve to create a common base. Other possibilities (e.g., stories, pictures, paintings, poetry, listening or talking about aspects of sound (pitch, duration, and tone color)), aspects of form (e.g., repetition, contrast, variation, ostinato, phrase, motive, rondo, layered, theme and variations, blues, and free form), and aesthetic ideas (e.g., density, texture, tension, and release) can be good starting points.

Here is an example:
Soraya teaches music as a music specialist in a public school (the 6th grade, 10 years old students). She has chosen to make a composition with the students like the American saxophonist John Zorn (born in 1953) had done. In October 1984, he finished a composition called "Cobra". This unpublished, but recorded composition consists of a set of cues notated on cards. The musicians play the card or cards that are shown by the musical leader. The person that leads the piece can be considered both conductor and composer. Using cards, the "conductor" can assign the orchestra to play soft, fast, and gentle. The musicians improvise their music by following the assignments on the cards. The conductor can subsequently show the card faster and add the card angrily. The piece will get a completely new sphere. Part of the class is the audience that has the role of critical friends that gives feedback to the musicians and the conductor. Soraya used the Cobra activity to let students explore aspects of sound and form. After the Cobra activity, the students had to write a piece of music based on musical contrasts.

4.5.1.2 Step 2 - Creating ideas and writing the composition

The second step focuses on providing children with opportunities to explore sound, form, and

meaning, and support children in this process. Children will develop routines in exploring music in a save pedagogical climate, which will lead to an optimum production of music and sounds. A teacher is a participant in the music composition process and helps children orientate; improve and deepen the activity; broaden skills and ideas; add new action potential; and last but not least, reflect on the composition. If this works, the next step will be to write down the music. This can be done not only in traditional music notations, but also in a graphical or pictorial way.

The role of the teacher in this process is to offer support for a draft version: To help the children who have difficulties get started and the children who need support for other reasons and/or have questions. The teacher is the partner of the children in their creative processes, who has more skills and knowledge than the children and gives impulses including asking questions to get the children to wanting new action potential (their zone of proximal development) and to support the learning of the new actions and concepts that emerge within this zone of their activities.

All children contribute to the music composition process. However, they can have several roles in this process, such as composer, performer, critical friend, etc.. Music composition can be realized optimally when students learn to play relevant roles in cultural practices (called "imitative participation") and are assisted to critically appropriate the tools and rules that are required for the accomplishment of these roles (Van Oers, 2012b). Some students prefer to take the role of composer. Some prefer to become musicians, performers, or conductors. Others have strong technical skills and use these skills to record the music composition or use their computer skills to score and publish the composition. In this way, all students participate in music composition as a meaningful activity. Of course, students should not only do the things they like most or are already good at. Roles will have to circulate, so students will broaden and deepen their knowledge, skills, and attitudes in the context of varying roles once they have successfully experienced music composition. The authors of this article observed that students were aware that all roles are equally important to make the composition activity a success. They like to contribute to the process in different roles.

A significant part of this second step of the composition process (creating ideas and writing the composition) is the revision phase. The revision of a piece of music is always focusing on the goal to make students reflect on their compositions and to help them improve the draft version of their composition. The revision can be done not only individually, but also with the class as a whole. In the last option, all students should have a copy of the notated music. It should also be performed live, or there should be a recording of the composition. The revision takes place in three rounds, in which the expert musician or the teacher should play a guiding role by asking critical questions as long as the students do not adopt this role of reviewer/critic (It is important to emphasize here that the playful mode of the composing activity should not be destroyed by the experts' participation):

1. On the ideas of the composer and the content of the piece. "Does the music sound as it was meant?". There can be differences in the experiences of the composer and the audience and/or musicians. The composer should be asked for his/her experiences, as well as the audience/performers. If the music sounds different from its intent, what can be done to make the music sound like it was meant?

2. The construction of the piece and its style. This second round is about the technical aspects of a composition. “What musical form is chosen?”, “Is there a logical construction of the piece?”, “What musical tools can the composer use to make the music more scary or gay?”, and “Is it possible for the musicians to perform what the composer wants, or not?”. Questions like these can be used to make students think about the construction and style of their compositions.
3. The notation of the music. The last revision round is about musical notation (pictorial, graphic, or traditional). Musical notation is a means, not a goal on its own. “Is it possible for other people to perform the piece, based on what is written?”, “Are there more simple ways of notating what you have written?”, and “Do you want me to show how a classical composer would have written this cadenza?”.

The teacher leads the revision by asking specific questions to regulate questions of the other students and making the children respond on each other’s questions to keep a safe atmosphere. All children correct the music on their copies. This whole process will lead to the students’ final version.

If music composition is a meaningful activity for children, they want to learn and improve their compositions on all aspects above. The teacher has a mediating role between creating a meaningful activity and the educational goals she/he wants to reach. Music composition is not only a challenging activity, but also an activity in which children can meaningfully appropriate certain musical concepts and skills. To become a good composer, a lot of exercise is necessary. The teacher’s role is to motivate, stimulate, and facilitate the process that leads to compositions that students will be proud of.

4.5.1.3 Step 3 - Presentation and publication or recording

It is easier to see the usefulness and necessity of composing music when one has an audience for its music. A persistent eagerness to produce music and to improve one’s compositions will be hard for any child without a guarantee that its music is listened to and is discussed. Live performances of compositions are very motivating for (young) composers. With modern electronic equipment, it is also possible to publish or record the music. Both scores and recordings are easy to distribute by digital means. Many children in upper grades of elementary schools have mobile phones. Most of these phones have recording capabilities. Of course, there is also more advanced equipment to record music. These recordings will have better sound quality than mobile phones.

Apart from the role of composers, musicians and audience are needed to improve (revision) and perform music. Distribution of roles and identification with these roles are of great importance (Stanislavski, 1968). Students will fulfill alternately the different roles needed for the creation and performance of music.

4.6 Conclusions

The drive for students’ creative involvement in cultural practices can be found in the desire of children to be part of and to participate in the world of adults, according to a basic assumption

of cultural-historical activity theory. This is their incentive for development and learning. Play offers people the opportunity to take part in practices in their own way, due to the essential degrees of freedom in play. This activity format of play offers people of all ages the opportunity to engage in imaginative situations and intense experience. On the basis of these theoretical assumptions, we construed "composing" as a playful cultural practice following some musical rules, allowing the participants some degrees of freedom and raising high levels of personal involvement. Through playful participation in a composing practice with experts, new comers can learn and improve the rules and appropriate relevant knowledge and skills. From this point of view, we conceive of the composing process as a planned, deliberate, and realization of a creative process with a new piece of music as the outcome (Campbell & Scott-Kassner, 2006). Pedagogical implications of music composition as a regular playful classroom activity are that the participating and guiding expert (teacher) should never impair the quality of the activity as play, i.e., the expert should abide by the characteristics of the activity format of play—rules, degrees of freedom, and intense experience. The article describes a pedagogical model consistent with this play-based approach as a three-step-model, in which step 1 is the creation of a common base, step 2 is creating ideas and writing the composition, and step 3 is the presentation and publication. An important part of the process is the revision phase, part of step 2. In this phase, the teacher focuses on the goal to make students think about their compositions and to help them improve their compositions.

Using the developed model for music composition, every classroom teacher should be able to work with students on music composition. It offers classroom teachers tools to motivate, stimulate, and facilitate students in working on challenging assignments, which offer students insight in musical concepts and develop musical skills. The presumed potential of this pedagogical model is that it can enhance meaningful musical learning in elementary school students. The validity of this theoretically construed claim can only be verified by further empirical research in which the model is implemented in everyday elementary classrooms. ■

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THE EFFECTS OF MUSIC COMPOSITION AS A CLASSROOM ACTIVITY ON ENGAGEMENT IN MUSIC EDUCATION AND ACADEMIC AND MUSIC ACHIEVEMENT: A QUASI-EXPERIMENTAL STUDY

Abstract

The present study aims to contribute to the understanding of the effects of music education, in particular music composition as a classroom activity for fifth- and sixth-graders. The intervention (experimental condition) focused on a three-step-model for music composition, based on the Cultural Historical Activity Theory of education, and has been compared with a teacher-centered approach mainly based on students' reproduction of music (control condition). Results indicated that after the six-month intervention period, students in the experimental group were more engaged in music education compared to students in the control group. The research did not show a statistical difference in learning outcomes with regard to intelligence, academic achievement and music achievement, although the students of the experimental group performed better with regard to reading comprehension than their counterparts in the control group. The authors conclude that music composition as a classroom activity is feasible and useful in elementary schools.

Hogenes, M., Van Oers, B., & Diekstra, R.F.W. (2015). The effects of music composition as a classroom activity on engagement in music education and academic and music achievement: A quasi-experimental study. *International Journal of Music Education,* 1–17

5. THE EFFECTS OF MUSIC COMPOSITION AS A CLASSROOM ACTIVITY ON ENGAGEMENT IN MUSIC EDUCATION AND ACADEMIC AND MUSIC ACHIEVEMENT: A QUASI- EXPERIMENTAL STUDY

5.1 Introduction

For a long time, music educators have suggested that music, either in the form of music education, music practice, or exposure to music, can have a significant impact on school achievement, school attendance rates, and students' conduct, both in elementary and secondary education (Koopman, 2005; Waller, 2007). Music education and exposure to music by listening or music-making would make children smarter and would have a positive influence on children's motor development, social-emotional skills and even improve their chance of success in society (Bastian, 2002). The question is whether these claims are supported in available scientific studies. Besides music educa- tors and musicians, educational researchers have considered the question of what effects music education can have on child development. Some researchers claim to have found effects on cogni- tive functioning, such as an increase in concentration and academic achievement, in addition to effects in the social and emotional domain (Elliott, 1995; Gardner, 2004).

Hogenes, van Oers, and Diekstra (2015) conducted a literature review on the impact of music on child functioning. Their review shows that research literature on the impact of music on child functioning can be divided into three groups: (1) the influence of music on cognitive functioning; (2) the influence of music on social-emotional functioning; and (3) the influence of music on motor functioning. They identified 21 studies that met their inclusion criteria, such as the use of an experimental or quasi-experimental research design, and age range (3–18 years). Eighteen of the 21 studies focused on cognitive functioning (1) studies in which the influence of music is examined in relation to the academic performance of children (Bastian, 2002; Bolduc, 2009; Eastlund Gromko, 2005; Geoghegan & Mitchelmore, 1996; Rossini, 2000); (2) studies with regard to enhancement of cognitive task performance (including the so called "Mozart effect") (Bilhartz, Bruhn, & Olson, 2000; Costa-Giomi 1999; Eastlund Gromko & Smith Poorman, 1998; Hallam, Price, & Katsarou, 2002; Hallam & Price 1998; Ivanov & Geake, 2003; Koutsoupidou & Hargreaves, 2009; McKelvie & Low, 2002; Schellenberg, 2004; Schellenberg, Nakata, Hunter, & Tamoto, 2007); and (3) intervention studies in which music has been investigated as facilitator of cognitive processes (Abikoff, Courtney, Szeibel, & Koplewicz, 1996; Furnham & Stephenson, 2007; Furnham & Strbac, 2002);. Of the 18 studies on cognitive functioning all, with three excep- tions (Costa-Giomi 1999; Eastlund

Gromko & Smith Poorman, 1998; McKelvie & Low, 2002), reported positive or moderate positive effects of music education on academic achievement, phonemic awareness, spatial reasoning, creative thinking, and cognitive task performance. In the two studies on effects on social-emotional functioning (Bastian, 2002; Ulfarsdottir & Erwin, 1999) (one of these fell also in the category of studies on cognitive functioning) a positive effect of music education was observed on interpersonal problem solving, alternative solution thinking, consequential thinking, positive interactions in the classroom, social climate in the classroom and the school as a whole. In one of the studies on social-emotional skills, positive effects were only found in the long term. A significant difference with regard to alternative solution thinking and consequential thinking was shown at the follow-up test after 7 months. The two studies identified with regard to motor functioning showed positive effects on motor independency, jumping and dynamic balance (Palmer & Meyer, 2000; Zachopouloua, Tsapakidou, & Derric, 2004). Hogenes, Van Oers, and Diekstra concluded that music education and exposure to music appear to have a positive influence on child functioning. However, the diversity in, among others, research design, validity, dependent and independent variables of the reviewed studies made it difficult to draw robust conclusions.

The aim of the present study is to gather empirical evidence with regard to the effects of productive music education on engagement in music education, and both music and academic achievement. The rationale for studying the connections between music education and other academic achievements is primarily to assess whether music education contributes to development in general. Our main research question is: "What are the effects of music composition as a classroom activity on engagement in music education and on academic and music achievement?" The authors specifically investigated the effect on academic and music achievement of productive music education on elementary school students compared to a teacher-centered approach, mainly based on reproduction of music with regard to singing, playing instruments, and music and movement. Engagement in music education means that students are able to, and motivated to, participate in music activities.

5.2 Theoretical basis and prior research on music composition as a classroom activity

5.2.1 Activity theory

The theoretical framework for this study is the Cultural Historical Activity Theory (CHAT) of education (Cole, 1996; Karpov, 2005; van Oers et al., 2008). The starting point for this approach is Vygotsky's assumption that education can promote students' development by assisting them to appropriate relevant cultural tools that help them to become self-dependent participants in cultural practices (Vygotsky, 1978a; Vygotsky, 1981). More recent elaborations of the approach emphasize the importance of participation in specific cultural practices that serve as context for meaningful learning in participants (Lave & Wenger, 1991). At first newcomers in a cultural practice just play a peripheral role in the practice (for example, as an observer), but in due time these novices master the relevant tools with the help of more experienced members for the improvement of their abilities for participation.

Involvement in real-life cultural practices generally confronts participants with problems that arouse new needs for knowledge and abilities. By connecting the guided learning processes in the context of such practices to the personal needs of participants, the learning is going to make personal sense for them, according to Leont'ev (1981), and as such contributes to the integration of the learning outcomes in a person's identity. Moreover, we can assume that strengthening the personal sense of the learning within practices will also contribute to the transformation of formal involvement in a practice into authentic personal engagement of the students with the practice (Lave & Wenger, 1991). Engagement with problems, people, and domains can have a synergistic effect (Stahl, 2006). Many dimensions can be distinguished with regard to engagement in learning. The nature of a problem given to students is critical. To get students to engage with a problem, the problem has to be meaningful for them (Leont'ev, 1981; Tolman, 1999), i.e., be functionally related to the practice. It has to involve issues that make sense to students within their interpretive perspectives on the world. It should also be a problem that challenges their current understanding, but is within reach of their understanding.

5.2.2 Music education

From the perspective of CHAT, music is a product of cultural history that always encompasses (by definition) a number of actually present or virtual co-actors. As such, music from this perspective is to be conceived as a form of distributed cognition (Cole & Engeström, 1993), produced in a collaborative process with actual or virtual others.

As a cultural phenomenon music activity can be interpreted in terms of rule-based, goal directed, and tool-mediated actions with sounds. Such musical activity can take several forms, such as reproduction of previously composed music or production of new musical pieces (composing). According to CHAT, learning to take part in such cultural activities implies getting involved in the related cultural practices with culturally more experienced people who can guide the novice towards appropriation of actions or fundamental operations (like using music notations in the case of a music activity) that are deemed relevant by the music community involved. Hence, music education can be conceived as a cultural endeavor to get children collaboratively engaged in the musical practices of the community and assist them in appropriating the roles and related tools in order to enhance their participation in such roles, as listeners, singers, players of musical instruments, or composers. Most of the time, however, children's involvement in music activities in schools are of the receptive kind (learning music composed by others). Like in other subject matter domains (e.g., reading and writing texts), we assume, however, that in music activities more productive versions of music-making (i.e. composing) may contribute in new and significant ways to children's development. Starting out such learning activities from the children's own musical imagination and giving them the (relative) freedom to compose their own songs, makes it a form of authentic learning. Activity theory (Leont'ev, 1981) provides us with a detailed theoretical language to describe and analyze the processes involved in such activity of composing (in terms of actions, personal sense, tools to use, rules to follow, goals to achieve, automatized operations, like audiation).

Music education in schools today includes several domains of musical behavior: singing, playing instruments, listening to music, music and movement, working with musical notation, and reflecting on listening and/or performance. Music composition can be added to this

list, but can also be considered as part of, or as derivative of, the domains singing, playing instruments, and working with musical notation (Campbell & Scott-Kassner, 2006).

Apart from listening there is a cognitive process called audiation, necessary for the understanding of music. The term audiation was introduced in 1975 by music education researcher Edwin Gordon. Audiation can be considered as the most important process in making music or listening to music (Gordon, 2003). It is a high-level thought process that involves mentally hearing and comprehending music, even when no physical sound is present. It is a cognitive process by which a person gives meaning to musical sounds with the help of the brain. In essence, audiation of music is analogous to thinking in a language. The term audiation should not be confused with audition, the mere perception of sound. Audiation is also more than just a musical form of auditory imagery. Developed audiation includes the necessary understanding of music to enable the conscious pre- diction of patterns in unfamiliar music.

In the present study we will focus on the comparison between students' involvement in musical practices as a composer (music production) versus reproducer/performer of music. Composing music can be seen as an activity that is similar to writing texts (Hogenes, van Oers & Diekstra, 2014). Within CHAT, language is seen as an important tool for cognitive processes (van Oers, 2005; Vygotsky, 1978b). Moreover, it is a means for communication. Vygotsky mainly saw language as speech, in other words as a process of dialogically composing texts with communicative intentions (Vygotsky, 1981). Vygotsky also pointed out that the invention and mastery of written means for communication strongly improved the communicative possibilities of man- kind and even its thinking faculty (Scinto, 1986; Vygotsky, 1978b, pp. 105–119). A strong anal- ogy can be made between text composition and music composition. As in writing texts, in music composition students deal with problems of expressing main ideas, sequencing, classification, and categorizing, and need special technical tools in order to become proficient as composers. Musical tools, like music notation, help them to acquire these intellectual competencies (Ruthmann, 2007; Wiggins, 1990).

Although active music composition may be uncommon for most elementary school students, on the basis of our theory, we can expect that participation in composition activity with the help of an expert and peers, may enhance the student's confidence in his or her possibilities to take part meaningfully in this activity (Mahn & John-Steiner, 2002), and even may stimulate his or her achievement motive and engagement (Markova, 1983). One of the aims of the present study, next to the effects of composition on academic and music achievement, is to examine these assumptions.

5.2.3 The present study

Given the main research question concerning music composition as a classroom activity (productive music education) a study was set up to examine the effects of music composition as a class- room activity on engagement in music education, music achievement, and academic achievement. In the present study two formats of music education: productive music education with composition as a classroom activity as core activity (designated as experimental condition), and a teacher- centered approach mainly based on reproduction of music (designated as control condition) were compared. Active music listening, and music and movement were important elements of both interventions.

5.3 Method

5.3.1 Design-procedure

A randomized groups pre-test–post-test–follow-up design was used for this study. Although the students were not randomly assigned to the experimental and control group, the classes were. The two music interventions were implemented in 18 weekly lessons of 45 minutes each. The lessons were given on a weekly basis in the period September 2010 through February 2011. Pre-test data on singing, listening, intelligence, language, reading comprehension, and mathematics were collected during the first 2 weeks of the school year, starting in September 2010. Post-test data on the same variables were collected 6 months later, right after the intervention. Follow-up data were collected at the end of the school year, 5 months after the intervention (July 2011). All measures were group-administered to students in the intervention and control groups by the first author. Data were collected and analyzed by means of standardized tests. At post-test, besides the variables mentioned above, engagement was measured by using a questionnaire. In many Dutch elementary schools, such as De Vijver, music is mainly used as a means during social occasions, like birthday celebrations. However, music education was no part of the school program. As the students had no systematic experience in music education before the intervention, it was not possible to conduct the questionnaire as pre-test. The intervention and the measures are described below.

5.3.2 Participants

All participants were students attending the elementary school De Vijver, located in the City of The Hague, comprising 500 students in 21 classes. The school works on the basis of the Dalton concept (Parkhurst, 1922/2007). The Dalton concept has been developed by Parkhurst, and is based on three principles: (1) freedom (students may choose from a limited list of optional tasks. They have freedom to choose the time on which, and the tempo in which, they work on certain subjects); (2) cooperation (cooperation refers to the social character of learning and knowledge); and (3) assignments (students have to plan and execute tasks independently without much guidance from an adult) (Parkhurst, 1922/2007).

The experimental group consisted of 31 girls (49.2%) and 35 boys (53%) comprising one fifth-grade class and two sixth-grade classes at the elementary school De Vijver in The Hague, the capital city of the province of Zuid-Holland, The Netherlands. The control group consisted of 33 girls (50.8%) and 32 boys (49.2%) comprising two fifth-grade classes and one sixth-grade class at the same school as the students of the experimental group. The music instructor for both interventions was the first author of this article (male, 40 years old, 17 years of instructional practice, who majored in music performance [electronic organ and keyboards], and music in education). The students in the experimental group had a mean age of 9.38 years (SD = .69). The students in the control group had an overall mean age at pre-test of 8.92 years (SD = .63). The vast majority of the participants were native speakers of Dutch, with 23 participants (13 in the intervention group, 10 in the control group) having a first language other than Dutch. In both groups, language and mathematics were taught the same way. The average class size was 22 students in both conditions.

For the analysis of post-test and follow-up data the *N* differs between measures depending upon differences in missing data. The number of missing data varied from 7.7% to 10.6%.

5.3.3 Interventions

The experimental group (*N* = 66) was involved in a program constructed according to a CHAT approach. In this intervention students were actively engaged in the activity of composing music, in which musical notation (as a sign system) was a helpful tool for organizing the activity, providing a means for effective communication about the object of the activity (in other words the music piece they were composing), and regulating specific actions to be carried out (Jones, 2011, for the role of signs in activities). Reflection played a crucial role here to keep track of the process and its (intermediate) outcomes. The music composition and music notation activities took an average of 30 minutes (2/3) per session. The experimental group worked collaboratively at music composition activities. The group work can be characterized by simultaneous interaction, positive interdependence, and individual accountability (Kagan, 1994; Slavin, 1983).

In contrast to the experimental group in which music composition as a form of productive music-making was central, the control group focused on reproductive music-making. The control group (*N* = 65) was taught from a teacher-centered approach. In this setting composing as a class- room activity played a minor role. The students of the control group mainly sang songs composed by songwriters, played music written by composers, did a lot of music and movement (activities in which aspects of sound and form are represented by movement and dance activities). The singing, playing and movement took an average of 30 minutes (2/3) per session. Both groups used all kinds of musical notation (traditional music notation, graphical and pictorial notation). In both interventions the production of music was the core activity, but the experimental intervention focused on *the child as composer* (music production), while the control intervention focused on *the child as performer* (music reproduction). One could also speak of production versus re-pro- duction. Manuals for both interventions are available from the first author of this article. The manuals contain complete lesson plans with goals, activities, and guidelines for materials and classroom layout. Before the actual experimental study was carried out a pilot study was under- taken to examine the feasibility of the proposed methods and design. In 10 weekly sessions of 45 minutes two classes of 9 and 10 year olds participated in music lessons. One group executed a sequence of lessons comparable with the intervention of the experimental group of the current study. The other group executed a sequence of lessons comparable with the intervention of the control group of this study. The pilot study showed the authors the importance of the first step of the three-step-model developed for music composition as a classroom activity, which will be described below: the creation of a common basis in order to start the process of music composition. Although the authors spent time creating a common basis in music composition activities in the pilot study, the executed activities demonstrated a need for extensive attention to this phase in the process. A second issue that came up in the pilot study concerned the second step of the music composition process: creating ideas and writing the composition. Part of this step is the revision phase. The revision of a piece of music always focuses on the goal to make students think about their compositions and to help them to improve the draft version of their composition (Hogenes et al., 2014). Revision of music composition has been widely described (Hickey, 2012; Kaschub and Smith, 2009, 2013; Kratus, 2012; Wiggins, 1990) The authors consequently became aware of the need to revise pieces in three rounds: (1) on the ideas of the composer and the content of the piece; (2) the construction of the piece and its style; (3) the notation of the music. Observations showed that insufficient attention to one of the rounds and/or changing the order of the rounds delivered less interesting

music compositions (e.g., insufficient use of aspects of sound and form), as well as reducing the student's engagement.

5.3.4 Research questions and hypotheses

This study addressed the following research questions:

1. What difference can be found between the effects of a music education intervention based on music composition as a classroom activity versus a music education intervention based on a teacher-centered approach mainly comprising reproduction of music on students' *engagement* in music education?
2. What difference can be found between the effects of a music education intervention based on music composition as a classroom activity versus a music education intervention based on a teacher-centered approach mainly comprising reproduction of music on *intelligence, academic achievement, and music achievement*?

Based on previous research (Bodovski & Farkas, 2007; Engeström, Engeström & Suntio, 2002; Marks, 2000), the authors of this article expected that students in the experimental group would be more deeply engaged in music activities in the classroom than the control group (Hypothesis 1). They would outperform on nonverbal intelligence compared with the control group (Hypothesis 2). Moreover, it was expected that students of the experimental group would perform better with regard to academic skills than the control group (Hypothesis 3). Furthermore, the authors expected the students of the experimental group to develop *better* musical abilities, especially listening and audiation, than the control group (Hypothesis 4). The reason for this expectation is that composition as a classroom activity may demand more high-level thought processes that involve mentally hearing and comprehending music (audiation) than performing music (Gordon, 2003).

5.3.5 Measures

Overview. To determine the effects of the two interventions with respect to children's academic performance, intelligence, and music performance, a battery of tests was used: CITO[1] Language Test (Spelling), CITO Reading Test, CITO Mathematics Tests, Raven Standard Progressive Matrices (SPM), and a Musical Abilities Test for Singing and Listening (Hogenes, van Oers & Diekstra, 2010a, 2010b). The CITO tests are part of the student monitoring system of the school. An intelligence test was included because relations between music education and intelligence have been found in previous studies (Bastian, 2002). The Raven Standard Progressive Matrices is a valid nonverbal intelligence test that can be used for group testing and was therefore suitable for this study. The Musical Abilities Test for Singing and Listening was designed for this study.

For this study, a pre- and post-test design was used. The pre-test was administered two weeks before the interventions started. The pre-test consisted of the Raven Standard Progressive Matrices, and the Musical Abilities Test for Singing and Listening. Also data from the student monitoring system were part of the pre-test. The post-test took place in the week upon completion of the intervention. The measurements from the pre-test were identically administered during the post-test. Additionally, a questionnaire was administered to measure students' experiences with and engagement in the interventions. The follow-up was conducted five months after the post-test. Measurements were the same as at the post-test with the exception of the experience and engagement questionnaire.

CITO, language test, spelling. For this study a CITO language test for spelling was used. The test has to be completed twice a year. The first test has to be conducted in the second half of the month of January or the first week of February, and the second test at the end of the school year. The test is part of the CITO student monitoring system. The spelling test assesses the ability of children to put words into word images. In grades 5 and 6 mainly two- and three-syllable words are tested for each year in 19 spelling categories. The tested words reflect the curriculum of the most frequently used language and spelling methods. The tested words are partly presented in the form of word and sentence dictation, and partly in the form of multiple-choice assignments (De Wijs & Krom, 2008; De Wijs, Krom & Van Berkel, 2007).

CITO, reading tests. For this study two CITO reading tests were used: technical reading and reading comprehension. Both sets of tests are completed twice a year. Both tests are part of the CITO student monitoring system.

The technical reading tests measure the accuracy and tempo of reading (Jongen, Krom & Roumans, 2009, 2010). The reading comprehension tests provide an insight into the development of reading skills of students and the differences between students. The tests cover the main objectives and their intermediate targets. The tests consist of multiple-choice questions with regard to texts the students have to read. Every test has two follow-up tests: an easier and a more complex one to make it possible to test the students in an adaptive way (Feenstra, 2008; Feenstra, Krom & Berkel, 2007).

CITO, mathematics test. The CITO Rekenen-Wiskunde [Arithmetic-Mathematics] tests were used to assess the children's progression during this subject. The assignments concern three domains: (1) numbers and operations; (2) measurement, geometry, time and money; and (3) ratios, fractions, and percentages. The tests were conducted twice a year. The tests are part of the CITO student monitoring system (Jansen, Scheltens, & Kraemer, 2006a, 2006b).

Raven, Standard Progressive Matrices (SPM). The Raven SPM test comprised 60 items arranged in 5 sets (A, B, C, D, and E) of 12 items each. It was used to measure the students' ability to form perceptual relations and to reason by analogy independent of language and formal schooling. The matrices consist of a series of patterns in upward progression. The first item of each set is almost natural to solve. The subsequent items build on the reasoning of the previous item and become more and more difficult. By solving the items in the given order, the method necessary to solve the following items is learned automatically. The five sets offer five opportunities to learn the necessary to solve the items and five progressive ways to measure the child's intellectual ability (Raven, 2004). In the literature reliability coefficients (Cronbach's alpha) are commonly reported to fall within the .80–.90 range (Raven, 2004). Our data deliver Cronbach's alpha T_0 $\alpha = .81$, T_1 $\alpha = .82$, T_2 $\alpha = .79$.

Musical ability test, singing. During the first music lesson the song "Aap in de boom" [Monkey in the tree] was taught to the students in both the experimental and the control group. The authors of this study wanted to assess the students' musical abilities as much as possible during the lessons according to the concept of dynamic assessment (Lidz & Elliott, 2000; Sternberg & Grigorenko, 2002; Tzuriel, 2001). This approach is based on the assumption that the level of

(musical) ability can be measured by assessing how easy a person finds it to learn something new with more or less help. In small groups of maximum four students they sang this song after the lesson. During the assessment the song was rehearsed one time without filming. Then it was sung for a second time, the moment of assessment of learning. The singing was taped on video and marked by two assessors (Interrater reliability at T_0, Melody, Kappa = .786; Rhythm, Kappa = .832; Comprehensibility, Kappa = .866; Expression, Kappa = .908).

The children's singing was scored on four items: correct melody performance, correct rhythm performance, comprehensibility, and expression. All items were scored on a 5-point scale: 1 = the student is unable to demonstrate …; 2 = the student is beginning to demonstrate …; 3 = the student is developing …; 4 = the student consistently demonstrates …; and 5 = the student exceeds their competency on the task (Hogenes et al., 2010a). Singing was assessed before the intervention started and right after the intervention and 5 months after the post-test (pre-, post- and follow-up tests).

Musical ability test, listening. During the first music lesson the students' listening abilities were assessed. The assessment was based on a measure developed by the authors and covering three domains: instrument discrimination/recognition, ensemble discrimination/recognition, and audiation.

The instrument discrimination/recognition part contained eight items (such as saxophone, and double bass). The ensemble discrimination/recognition parts contained four items, and the student had to fill out eight items of the audiation game (Hogenes et al., 2010b). The Cronbach's alphas for these measures were less than satisfactory (instrument and ensemble discrimination/recognition T_0 α=-.20, T_1 α=.19, T_2 α=.36, audiationT_0 α=.57, T_1 α=.43,T_2 α=.07). Therefore it was decided to exclude the listening tests from the analysis.

Engagement test. At post-test an Experience and Engagement questionnaire was administered. This questionnaire was developed by the authors and contains 16 questions and statements focusing on children's experience and engagement in music education. Examples of statements used are: "I became curious to how music is constructed by composing music myself"; "Most of the time, we could improve our compositions by looking to our compositions (revising) together with the teacher"; "There was lots of 'space' for my own ideas in the music classes." All questions were assessed with Likert-type scales. The reliability of the questionnaire appeared to be highly satisfactory (Cronbach's alfa α = .96).

5.4 Results

Below the results will be presented as follows. First of all the effect of composition as a classroom activity on engagement in music education, followed by the effect of composition on intelligence, academic performance (language (spelling), mathematics and reading comprehension), singing (melody, rhythm, comprehensibility and expression) will be presented.

Table 1 Correlations among variables at pre-test.

Variable	1	2	3	4	5	6	7
1. Intelligence	.745***						
2. Language (spelling)	.24**	.818***					
3. Mathematics	.57***	.44***	.867***				
4. Reading comprehension	.31**	.29**	.35***	.753***			
5. Singing (melody)	.08	-.12	-.08	.18	.425***		
6. Singing (rhythm)	-.01	.15	-.09	.05	.06	.322***	
7. Singing (comprehensibility and expression)	.07	-.06	-.02	.16	.04	.41***	.661***
Mean	34.42	126.00	62.67	3.03	1.96	2.63	4.86
Std. Deviation	8.13	8.66	16.35	1.18	.700	.78	1.12

* $p < .05$. ** $p < .01$. *** $p < .001$.

The diagonal shows correlations between pre-test and post-test.

Table 2 Correlations among variables at post-test.

Variable	1	2	3	4	5	6	7	8
1. Engagement	-							
2. Intelligence	.27**	.739***						
3. Language (spelling)	.36***	.39***	.816***					
4. Mathematics	.23***	.64***	.51***	.890***				
5. Reading comprehension	.02	.51***	.32***	.42***	-			
6. Singing (melody)	-.11	.03	.10	.02	.11	.572***		
7. Singing (Rhythm)	-.19*	-.00	.03	-.09	.15	.55***	.658***	
8. Singing (comprehensibility and expression)	-.27**	-.02	-.17	-.12	.15	.40***	.42***	.688***
Mean	0.00	36.78	130.79	70.99	2.79	3.30	3.75	6.51
Std. Deviation	1.00	7.89	9.20	15.83	1.27	.67	.54	1.31

* $p < .05$. ** $p < .01$. *** $p < .001$.

The diagonal shows correlations between post-test and follow up-test.

Correlations among variables at pre-test, post-test, and follow-up tests respectively, are shown in Tables 1, 2 and 3. At pre-test, spelling correlated positively with intelligence, as did mathematics and reading comprehension. Moreover, singing (comprehensibility and expression) correlated positively with singing (rhythm). At post-test, the same positive correlations were found, except for reading comprehension. Finally, engagement correlated positively with spelling, mathematics, and reading comprehension, but correlated negatively with all aspects of singing.

Table 4 shows descriptive statistics (means and standard deviations) for all measured variables at pre-test, post-test and follow-up test in both conditions (intervention and control group). All score distributions were approximately normal and, thus, appropriate for use in parametric statistical analyses.

To address the first research question concerning the effect of composition as a classroom activity on engagement in music education, an analysis of covariance (ANCOVA) was performed with age used as covariate, and with condition (intervention vs. control) as the independent variable. Levene's test indicated that the assumption of homogeneity of variances was violated (p = .002). But ANCOVA is robust to mild violation of the assumption with roughly equal groups sizes (Rogan & Keselman, 1977). For all consecutive ANCOVA models assumption of homogeneity of variances has been met. Moreover, for none of the ANCOVA models the covariates interacted with the condition (p > .05), indicating that the data met the assumption of homogeneous regression slopes.

Table 3 Correlations among variables at follow up-test.

Variable	1	2	3	4	5	6
1. Intelligence	.779***					
2. Language (spelling)	.32***	.807***				
3. Mathematics	.64***	.55***	.857***			
4. Singing (melody)	-.11	.14	-.09	.237**		
5. Singing (Rhythm)	.05	.16	-.06	.43***	.275**	
6. Singing (comprehensibility and expression)	.17	.25	.003	.43***	.56***	.491***
Mean	36.17	135.41	78.09	3.18	3.64	6.83
Std. Deviation	7.93	8.80	14.84	.478	.56	1.08

* p < .05. ** p < .01. *** p < .001.

The diagonal shows correlations between follow up-test and pre-test.

Table 4 Descriptive statistics for variables at pre-test, post-test and follow-up-test.

Intervention						
	Pre-test		**Post-test**		**Follow up-test**	
Measure	*M*	Std Dev	*M*	Std Dev	*M*	Std Dev
Engagement	-	-	1.00	.27	-	-
Intelligence	36.43	7.21	39.15	7.18	37.28	7.77
Language, spelling	128.74	8.96	133.85	9.09	136.98	8.29
Reading comprehension	2.96	1.13	2.93	1.16	-	-
Mathematics	67.47	15.31	75.83	15.13	82.57	13.28
Singing, melody	2.03	.78	3.27	.69	3.18	.50
Singing, rhythm	2.32	.85	3.65	.63	3.57	.65
Singing, comprehensibility & Expression	4.48	1.19	6.20	1.31	6.63	1.10
Control						
	Pre-test		**Post-test**		**Follow up-test**	
Measure	*M*	Std Dev	*M*	Std Dev	*M*	Std Dev
Engagement	-	-	-.94	.19	-	-
Intelligence	32.29	8.47	34.52	7.92	35.22	8.16
Language, spelling	123.50	7.07	127.67	7.83	133.97	8.60
Reading comprehension	3.14	1.22	2.66	1.32	-	-
Mathematics	58.05	16.37	66.46	15.53	73.36	15.32
Singing, melody	1.89	.62	3.35	.65	3.18	.46
Singing, rhythm	2.92	.57	3.85	.40	3.72	.45
Singing, comprehensibility & Expression	5.20	.94	6.81	1.25	7.03	1.05

Table 5 Adjusted marginal means and standard errors for dependent variables at post-test and follow up-test.

Measure	Intervention		Control	
Post-test	*M*	SE	*M*	SE
Engagement	1.0	.03	-.93	.03
Intelligence	37.63	.71	35.97	.69
Language, spelling	131.51	.72	129.88	.70
Reading comprehension	3.01	.11	2.58	.11
Mathematics	71.95	1.10	70.22	1.08
Singing, melody	3.24	.08	3.38	.08
Singing, rhythm	3.75	.07	3.75	.07
Singing, comprehensibility & Expression	6.62	.13	6.43	.12
	Intervention		**Control**	
Follow up-test	*M*	SE	*M*	SE
Engagement	-	-	-	-
Intelligence	35.98	.67	36.47	.65
Language, spelling	134.57	.72	136.18	.68
Language, vocabulary	63.27	2.65	61.47	1.63
Reading comprehension	-	-	-	-
Mathematics	78.73	1.07	77.01	1.04
Singing, melody	3.14	.06	3.23	.06
Singing, rhythm	3.68	.08	3.62	.07
Singing, comprehensibility & Expression	6.84	.13	6.84	13

Moreover, for none of the ANCOVA models the covariates interact with condition ($p > .05$), indicating that the data met the assumption of homogeneous regression slopes. Table 5 shows the adjusted marginal means and standard errors for the dependent variables. The ANCOVA showed a statistically significant effect of condition on the engagement measure after adjustment by covariates. That is, consistent with the hypothesis, students participating in the composition as a class- room activity intervention ($M = 1.00$, SD = 0.27) indicated more engagement in music activities than did students in the control condition ($M = -0.94$, SD = 0.19), with $F(1, 121) = 1805.29$, $p < .001$, partial $\eta^2 = .937$. The covariate of age, $F(1, 121) = .29$, $p = .59$, partial $\eta^2 = .002$ did not reach a conventional level of statistical significance. This dependent variable was measured once after the intervention.

The second research question concerned the effect of composing music as a classroom activity on intelligence. The ANCOVA showed no statistically significant effect of condition on intelligence measured at the post-test after adjustment for covariates: age and intelligence measured at the pre-test. The ANCOVA showed no statistically significant effect of condition

on intelligence measured at the follow-up test after adjustment for covariate intelligence measured at the pre-test.

Next, to address the third research question, concerning the effects of the intervention on academic achievement, a MANCOVA with language (spelling), reading comprehension, and mathematics being dependent variables, controlling for age and pre-test results was performed, followed by three separate ANCOVAs. In the MANCOVA and ANCOVA models all covariate pre-test scores were statistically significant, $p < .005$. The results of the MANCOVA tests with the use of Wilks' criterion indicates a marginally significant effect of condition on combined dependent variables, Wilks' $\lambda = .933$, $F(3, 104) = 2.48$, $p = .065$, partial $\eta^2 = .067$.

Follow-up separate ANCOVAs showed a significant effect of the condition on one out of three academic achievement indicators. The ANCOVA showed a statistically significant ($F(1, 112) = 7.42$, $p = .007$, partial $\eta^2 = .06$) effect of condition on reading comprehension measured at the post-test after adjustment for covariates: age and pre-test score of reading comprehension. The covariate of age, $F(1, 112) = .22$, $p = .638$, partial $\eta^2 = .00$ and did not reach a conventional level of statistical significance.

The results for both language (spelling) and mathematics have shown higher average scores in the experimental group than in the control group, controlling covariates age and pre-test scores but these differences were not statistically significant at $p < .05$.

To address the effects of the intervention on academic achievement at the follow-up, we performed a MANCOVA with language (spelling) and mathematics being dependent variables, con- trolling for pre-test results. Reading comprehension is not used as a dependent variable due to the fact that there were no data available at the follow-up. The results of the MANCOVA tests did not show a significant effect of condition on combined dependent variables ($p = .101$).

The fourth research question, concerning the effects of the intervention on children's music achievement, was addressed through analyses of variance focused on effects of intervention on the performance of singing: (1) melody; (2) rhythm; (3) comprehension and expression.

The results of the MANCOVA tests with the use of Wilks' criterion did not show a significant effect of condition on singing achievement, Wilks' $\lambda = .996$, $F(3, 117) = 0.17$, $p = .92$, partial $\eta^2 = .004$. The effects of the intervention on children's music achievement at the follow-up also did not show a significant effect of condition on singing $p <. 05$.

5.5 Conclusions and discussion

The overall results of the present study comparing two types of music education, an intervention that emphasizes music production by composition and an intervention with an emphasis on music reproduction, showed the following. First of all, the study demonstrates positive effects on students' engagement in both types of music education, but greater effects in the music production condition, which confirms the hypothesis that music production

would lead to more engagement in students than music reproduction. Secondly, this study does not support the hypothesis that music education as such contributes to nonverbal intelligence. Also, no differences in this respect were found between students in the music production condition versus students in the reproduction condition. This deviates from the findings reported by Bastian (2002) in which significant positive effects of music education on intelligence were reported. Thirdly, the findings of this study partly confirmed the hypothesis that the students of the experimental group would perform better with regard to academic skills than the control group. The students of the experimental group performed better with regard to academic skills than their counterparts in the control group; at least, such an effect was found for reading comprehension. It remains uncertain to what this difference should be attributed. One possibility is that students in the experimental group made extensive use of symbolic notation and were more focused on the text-like dimensions of their compositions. A transfer to reading comprehension could have taken place. Fourth, although both groups showed progress with regard to singing, no significant difference between both groups was found in this respect, despite the fact that the control group sang much more than the experimental group. This might indicate, since relevant variables here are melody and rhythm performance as well as expression and comprehensibility, that these can apparently also be improved by non-singing music activities.

In conclusion, this study highlights the surplus value on several dimensions of composition as a classroom activity, such as on engagement and on academic abilities, such as reading comprehension. This study has shown that music composition is feasible and useful in elementary school. Students are able to compose music in the same way as they are able to sing songs, play instruments, and perform dances. The authors of this study conclude that productive music education is evidently more engaging for students than reproductive forms of music education. However, productive music education requires teachers to have different pedagogical, didactical, organizational, and reflective skills than reproductive music education. For example, using forms of cooperative learning and differentiated instruction. This has consequences for teacher education.

The value of these findings are substantiated by the fact that the current study meets scientific standards (Slavin, 2008) with regard to: (1) randomized assignment: classes were randomly assigned to the experimental and control group; (2) sample size: 131 students participated in this study; and (3) duration: the study lasted 10 months.

Nevertheless, there are a number of limitations to this study. First of all, randomization was only at the class level and not at the level of students or school. Secondly, the same teacher carried out both interventions. A possible proclivity towards one or the other approach to music education can- not be excluded as having affected the outcomes. Third, it can also not be excluded that differences between both conditions had to do with factors other than the presence or absence of composition as an activity. For example, music composition might require different forms of interaction between teacher and students than reproductive music activities. For example, in music composition activities students get more individual feedback and feedback in small groups than in music reproduction activities where the class is addressed as a whole.

Notwithstanding these possible limitations, the findings with regard to engagement and certain academic skills, such as reading comprehension skills, as a result of music education through com- position, are intriguing enough to warrant further research and reconsideration of the content of music education in other elementary school settings and with other teachers. ■

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Endnote

[1] CITO is a Dutch testing and assessment company. Measuring and monitoring human potential has been their core competence since 1968. The vast majority of Dutch elementary and secondary schools use tests developed by CITO. CITO does not provide information about the reliability of their tests. Considering the status of the institute we can safely assume that the tests are reliable and valid. CITO tests are com- parable with what in the USA is designated School Aptitude Tests (SAT).

NOA, A 10-YEAR-OLD COMPOSER: A CASE STUDY

Abstract

The present case study aims to contribute to the knowledge of music composition as a meaningful activity in music education. An extensive amount of literature on music composition is available; however, music composition as a regular classroom activity is rarely seen in elementary schools. The effects of closely guided music composition, in which extra attention is paid to the revision of music compositions, on engagement in music education and music achievement in a single subject situation were studied using a three-step-model for music composition based on the cultural-historical activity theory. The authors conclude from this case study that executing music composition activities is possible and potentially accessible for elementary school children. The used music composition model offers classroom teachers and music specialists' possibilities to teach music composition in elementary schools and make music composition accessible for elementary school children. The current study shows that an intense collaboration between a student, as novice, and her teacher, as more knowledgeable adult, leads to more complex compositions than was seen in classroom situations. The intense collaboration offers the teacher the opportunity to adapt to ideas, needs and interests of the student. Therefore, to offer all children in a classroom situation the assistance they need, working in small groups is suggested.

Hogenes, M., Van Oers, B., & Diekstra, R.F.W. (2014). Noa, a 10-year-old composer: A case study. *Journal of Arts and Humanities,* 3(12), 1-15.

NOA, A 10-YEAR-OLD COMPOSER: A CASE STUDY

6.1 Introduction

Although there is an extensive amount of available literature on music composition, music composition as a regular classroom activity is rarely seen in elementary schools (Mills, 2009). Hogenes, Van Oers, Diekstra & Sklad (in press) conducted a study to the effects of music education, in particular music composition as a classroom activity. The intervention in this study was based on a model for music composition developed by the first author using the Cultural Historical Activity Theory (CHAT) as a theoretical framework (Cole, 1996; Karpov, 2005; van Oers, 2012; Vygotsky, 1978).

In this six-months intervention study music composition was introduced in music tuition in fifth- and sixth-grade elementary classrooms (Dutch school system; age 9-10 years old). The intervention focused on a three- step-model for music composition (Hogenes, 2010): (1) creation of a common basis in order to start the process of music composition; (2) creating ideas and writing the composition. One important task in this stage is the task of revision in which students improve the draft version of their composition; and (3) presentation and publication or recording. This intervention was compared with a teacher-centered approach mainly based on reproduction of music (e.g. singing songs). In conclusion, this study highlighted the surplus value of music composition as a classroom activity. Although it is questionable whether music education can be validated only by its academic benefits, the study showed benefits of composition on reading comprehension, but foremost demonstrated more engagement in music education and better listening skills than in teacher-centered music education. The study showed positive outcomes described above and revealed that music composition as a regular classroom activity is possible. However, one part of the composition process, the revision of a music composition, proved to be difficult in a classroom of 22 students. It is complicated to give all students the attention and feedback they need to improve their music compositions and therewith their music skills and knowledge.

The authors decided to conduct a follow-up study to explore the effects of guided music composition in a single subject situation to explore the composition activity in greater detail, specifically the revision phase, and examine the effects of expanded music composition activities on engagement in music education and music achievements, as compared to music composition with a classroom as a whole (see Hogenes, Van Oers, Diekstra, & Sklad, in press). The main research question was: “What are the effects of closely guided music composition in which the revision of the compositions is particularly emphasized, on engagement in music education and music achievement in a single subject situation.” The study was set up as a case study with Noa, a ten-year-old girl. For this N=1 study the three-step-model developed by Hogenes (2010) was used as format for a ten-week intervention.

6.2 Theoretical framework

6.2.1 Cultural-historical activity theory

The foundations of the cultural-historical activity theory were formulated in the early 1920 by Vygotsky and Leont'ev in their attempt to understand human development as a primarily cultural process based on the quality of the interactions between children and adults (see Newman, Griffin & Cole, 1989; Van der Veer and Valsiner, 1991; Vygotsky, 1978; Wertsch, 1987). Children learn through interactions with more knowledgeable others in the context of cultural practices that make sense to them and that can provide them with the cultural tools (both material and symbolic) that they need for improving their participation in these cultural practices.

Tools are culturally created artefacts, which are used by humans as tools to satisfy their needs and reach their goals (Newman, Griffin & Cole, 1989). Vygotsky distinguished two types: material tools (e.g. pencil, sheet music, musical instruments) and symbolic tools (e.g. words, notes, numbers, schemes). Symbolic tools have a material vehicle like graphic expressions or material signs such as pictograms. Material tools get their meaning partly by a symbolic framework (Wardekker, 2009). Vygotsky considered language as the most important tool for human beings. Language facilitates the construction of cultural meaning that matters in the communities in which people live, and offers a window into human minds and their communities.

An important tenet of the cultural-historical activity approach is that each psychological function starts out in an interpersonal activity that gradually evolves into a personal capacity with the help of more knowledgeable others. That is why educators are seen as responsible people to a great extent for the contents and pace of children's cultural development. Educators can deliberately advance children's development by getting them involved in cultural activities and help them with the appropriation of actions and tools that they do not yet master on their own but that they can appropriate with proper help from more knowledgeable others. This area of new action potentials that can be mastered within meaningful practices with appropriate help from others is called the zone of proximal development (see for example Vygotsky, 1978,p. 86). Through promoting such new actions and assisting students to perform these actions, teachers can stimulate students' development within the practices they are collaboratively involved in.

Music composition in schools can be seen as an activity that is constituted by collaborate activities on musical materials. In these collaborate activities; children grow in comfort and security in their learning environment (St. John, 2010). They form relationships and realize a sense of belonging. Dissanayake (2000) suggests that belonging is fundamentally connected to our ability to find meaning, develop competence and realize elaboration. "The unique subset of experiences that each participant brings to the learning community creates an environment rich in potential. As contributions are offered and received, the give and take of ideas evolves into a learning experience beyond individual possibilities" (St. John, 2010). This also applies to music composition activities. Students bring in diverse musical experiences with regard to music making and listening. Some children are able to play musical instruments and might be able to play more complex melodies and/ or rhythms than other students with

less or no experience in playing a musical instrument. However, it is possible that students with hardly any with experience playing instruments have rich listening experiences, for example with regard to styles and kinds of music. The collaborative process of give and take can lead to music compositions that could not be made by single students. The resulting compositions are actually outcomes of their shared activity based on the amalgamation of ideas and skills of members of a group.

6.2.21 Music composition as playful activity

On the basis of literature study, the authors of this article define music composition as a planned, deliberate, realization of a creative process with a new piece of music as outcome (Campbell & Scott- Kassner, 2006). It is a creative activity that can be conceived as a kind of play.

Van Oers (van Oers, 2009, 2010, 2012) developed an activity theory interpretation of play that conceives of play as a way human activities are accomplished. All human activities can be realized in more strict and mechanic ways, or in more free and joyful ways. In line with the thoughts of Vygotsky, El'konin, Leont'ev, and others, play can be characterized as a special mode of activity, characterized by its rules, degrees of freedom, and engagement.

From this activity theory approach, music composition can be considered as a playful activity, in which children are encouraged to act as composers, taking advantage of some creative freedom while making their own music in highly involved ways. Composition activities involve indeed both musical and organizational rules. However, given the complexity of composition as a cultural activity, children (as novices) cannot autonomously accomplish this activity from the beginning. Composition activities give children access to a complex cultural practice, but most children need assistance to improve their abilities for participation.

Furthermore, music composition is an activity in which most children can be, and want to be, engaged. Children are permitted to operate with a certain *degree of freedom* with regard to creative interpretations in this process. They follow rules that belong to the music composition activity, but have the right to deploy these rules their own way. *Engagement* in music composition activities can be interpreted as intense musical experiences by creating one's own music. Similarly, Barrett (2003) described the composition process as an intensely personal process of meaning-making. *"Musical meaning-making is an accomplishment of the child who –as musician and composer– is engaged in a dialogue with self and the emerging musical work, a dialogue that is mediated by the culture. The constant dialogue –between the roles of composer, critical listener, and performer– forms the heart of musical meaning making"* (Barrett, 2003, p. 23-24). The interaction with an expert offers novices possibilities to explore new action potential that contributes to improvement in their participation in these cultural practices. From this point of view, we argue that musical learning in elementary school can be embedded in music composition as a practice of playful music making, in which children should be involved under guidance of a more knowledgeable adult (Hogenes, Van Oers & Diekstra, 2012).

In order to investigate music composition in elementary school children and deepen our understandings of composition activities in elementary school pupils, the authors decided to supplement the quasi-experimental classroom study (Hogenes, van Oers, Diekstra, and

Sklad, in press) with a single-subject design. Main difference between this case study and the classroom study is the attention that is given to the participant, especially during the revision of music compositions. The classroom study showed that giving attention and feedback needed for revision of music compositions was difficult to a class with 22 students. An intense collaboration between the student and her teacher could lead to more complex compositions. In the current study, the computer is added as tool to write music (Sibelius software).

6.3 Methodology

6.3.1 Procedure - design

This study was designed as a qualitative interpretive case study (Miles & Huberman, 1994; Stake, 1995; Yin, 2009) of Noa, a 10-year-old girl who came to a series of 10 weekly music lessons, aiming at music composition. In this single-subject case-study, we looked at the effects of closely guided music composition, in which attention is particularly paid to the revision of music compositions, on engagement in music education and music achievement.

In this intervention, multiple data-generation methods were used, including a questionnaire, a semi- structured interview, natural observations (field notes and audio recordings), and the analysis of the composition work in order to examine Noa's experiences and perceptions of the lessons in music composition, and inquire our main research question: *"What are the effects of closely guided music composition, in which much (extra) attention is paid to the revision of music compositions, on engagement in music education and music achievement in a single subject situation."*

6.3.2 Participant

Noa is a 10-year-old girl. At the start of this study Noa was 10.4 years old. She grew up in a family with her parents and a four-year younger brother. Noa's father plays guitar in a cover-band. Noa's mother doesn't actively participate in musical activities. Apart from this study Noa has voice lessons once every two weeks and taught herself to play easy pieces on soprano recorder. She started taking voice lessons at age 9. She is mainly surrounded by pop/rock music all her life.

6.3.3 Intervention

The intervention for the present case study focused on music composition using Hogenes' (2010) three- step-model, adapted from a model for text composition (Pompert, 2004). This three-step-model for music composition comprises the following three steps: (1) Creation of a common base, for example by listening to a music composition, in order to start the process of music composition; (2) Creating ideas and writing the composition; (3) Presentation and publication or recording.

Part of the second step of the composition process is a revision phase. The revision of a piece of music focuses on the goal to make students reflect on their composition and encourages them to improve the draft version of their composition. The revision takes place in three rounds: (1) Based on the ideas of the composer and the content of the piece; (2) The construction of the piece and its style; (3) The notation of the music (see Hogenes, van Oers & Diekstra, 2014).

The revision can be done individually but also with a class as a whole. In this latter option, all students should have a copy of the scored music in order to give feedback on the way music is scored (round 3). To be able to hear whether a music composition is perceived as meant, it is necessary to hear a musical piece played. This can be a life performance, or a recording of the music composition.

In ten weekly sessions with an average duration of 60 minutes, compositions were created following the model described above. During the sessions, several composition techniques and instruments were used. The first-named author (Hogenes) taught the composition lessons. He has 17 years of experience in instructional practice in music education. Hogenes is Noa's uncle.

6.3.3.1 Leaning objectives and content of the composition sessions

In all sessions, Noa was engaged in music composition activities. Table 1 shows the specific learning objectives and content of the 10-conducted music composition sessions of this study.

Session	Learning objectives/ content At the end of the session the student .....
1	- has explored several musical instruments. - improvised on rhythms offered by the teacher. - explored musical concepts, such as measure, rhythm, and form. - performed graphically scored compositions. - made a music composition using graphical notations. - scored her own music composition, using graphical notation.
2	- demonstrated awareness of the form principles: repetition, contrast and variation. - played rhythms, notated in staff notation on flashcards. - demonstrated awareness of periodicity in music. - listened to 'Clapping Music' by Steve Reich. - made a music composition for clapping and ostinato accompaniment.
3	- was introduced to "new" kind of music notation: graphic notation in which words show how they should be spoken. - listened to 'Stripsody' by Cathy Berberian. - explored ways to pronounce/ declaim a poem. - demonstrated awareness of aspects used for singing and speech (e.g. articulation). - created a music composition based on a poem.
4	- played melodies, copying theses melodies from the teacher. - played melodies from melodic flashcards in G-major and g-minor. - made a music composition in an AABA-form, based on the melodies on the flashcards. - harmonized her own music composition with (I-V-I, see figure 5) - performed her own composition.
5	- explored the possibilities of the Apple software GarageBand. - listened to several available audio samples in GarageBand. - discussed the construction (sound and form) of pop songs. - composed a one-minute music composition. - shared her music composition with relatives by sending it to them by e-mail.

6	- was introduced to a musical box. - improvised in a pentatonic scale on chime bars. - composed an eight-bar pentatonic melody on the chime bars. - transferred the eight-bar pentatonic melody to a carton strip for a musical box. - was introduced to the concept of canons/ rounds. - created a round based on the composed pentatonic melody. - scored the music composition using the notation software Sibelius.
7	- was introduced to a music composition in which a poem was accompanied by musical instruments. - explored possibilities to recite poems. - experimented with musical instruments that can be used to illustrate a poem, such as cabasa, flexatone and vibra slap. - made a music composition, based on a poem. - recorded her own composition.
8	- listened to two rondo pieces. - further explored the possibilities of the Apple software GarageBand. - experimented with form principles: repetition, contrast and variation - composed a rondo (ABACADA).
9	- listened to 'The Watermelon Man' by Herbie Hancock. - was introduced to eleven Orff and Latin instruments. - copied rhythms and improvised on these rhythms. - made a music composition based on ostinati. - scored her composition, using Sibelius notation software.
10	- listened to 'Night train' by Jimmy Smith. - played an accompaniment on metallophone (blues). - recorded the accompaniment, using Sibelius. - added and recorded several percussion parts to the music composition. - composed a melody to her blues in C.

Table 1: Leaning objectives and content of the music composition sessions

6.3.4 Data generation and analysis

At the commencement of the study a short demographic questionnaire was administered. This provided an overview of the age, musical education, musical experience of the participant. A second questionnaire[1] was administered at the end of the study to inquire Noa's engagement in music education.

During the composition sessions field notes have been taken and audio recordings[2] of the music compositions have been made. Semi-structured interviews were conducted as part of the composition sessions and processed in the reflections on the composition sessions. The purpose of these interviews was to gain insight in Noa's opinion about: the nature of the composition activities/ assignments; the effectiveness of the teacher's interventions and feedback, specifically with regard to the revision process; the experience of rules, degrees of freedom, and engagement (play format); the use of music listening to create a common base; and, the use of music notations, both graphic and staff notation.

6.4 Findings

6.4.1 Reflective descriptions on the music composition sessions

Session 1, composition: Exercise No.1. In this first session several musical instruments were explored. Noa tried to make sounds with the instruments that were displayed for this session and was asked to copy/ repeat rhythms played by the teacher. After copying several simple, and more and more complex rhythms, she improvised on these rhythms. Making/ playing music, musical concepts like measure, rhythm, but also form were explored by copying rhythms, musical motives and phrases, playing variations and contrasting rhythms on the music that was played by her teacher. The teacher introduced new elements during the process of making music depending on the skills and knowledge displayed by Noa. This way was tried to get Noa from the level of actual development into the zone of proximal development.

In this whole process of musical play, graphic notation was shown, discussed and inquired by performing three simple graphically scored compositions. Using the improvisation plus the inquired graphic notations as a common base, Noa started creating ideas and started writing her composition. Noa and her teacher worked together and composed a music composition that she liked and that is reproducible by others because of its clear graphical notation (see figure 1). At the end of composition session, the piece was recorded.

Initially the process of music making in this session was mainly based on the reproduction of rhythms, but during the process the music making shifted to music production. This production started with improvisations that were later used for the new music composition.

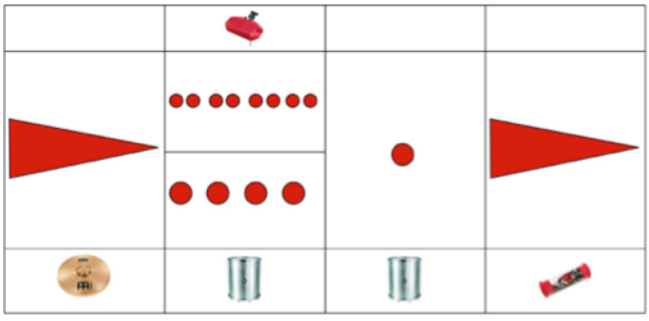

Figure 1: Part 1 of 'Exercise No.1'

Session 2, composition: *Clapping Music*. This session started with a reflection on the first composition session in which, among others, rhythms were copied. Moreover, Noa had played with the aspects of form: repetition, contrasts and variation. In this second session, Noa was offered a number of rhythms notated in staff notation on flashcards (see figure 2). The teacher played these rhythms. Noa copied them. This activity evolved into a rhythmical question and answer game, using the provided rhythms.

Figure 2: Three examples of rhythms notated on flashcards

At the beginning of this second session, Noa had very limited knowledge of traditional music (staff) notation. By playing the rhythms from the flashcards, her understanding of rhythmic notation increased what could be perceived from the tempo in which Noa was able to play rhythms, and the decrease of the number of errors she made. By performing rhythms, Noa demonstrated awareness of periodicity in music. Her teacher played a musical phrase of four bars. Noa was able to add a musical phrase complementary to this phrase, getting more and more feeling for appropriate rhythms, taking into account the musical tension of a phrase. Based on this experience of music making and also listening to the composition 'Clapping Music' by the composer Steve Reich, Noa made a composition for clapping and an ostinato accompaniment for Surdo (Brazilian drum). For this music composition, Noa used the flashcards offered at the beginning of the session. However, she also used some rhythms she "invented" herself. Her teacher wrote these rhythms down for her in staff notation. She created a composition of 16 bars. At the end of the session Noa and her teacher proudly performed Noa's 'Clapping music' for a family member.

Session 3, composition: **I am Rose**. Exploring several kinds of musical notation, Noa was shown a new kind of notation, namely a form a graphic notation in which words show how they should be spoken with regard to pitch, duration and expression. The composition 'Stripsody' of Cathy Berberian (1966) was listened while Noa had to put the loose pages of the score in the right order. Both this kind of musical notation as this kind of "contemporary" music was new to Noa. In order to create ideas and write the music composition, Noa was offered three books with poetry for children. She chose an English poem written by Gertrude Stein: 'I am Rose'. After discussing the content of the poem, Noa explored ways to pronounce/ declaim words and sentences. In this process of creative reproduction she became more aware of aspects used for singing and speech, such as posture, breathing, articulation, resonance, voice range, use of vowels, et cetera. This could be heard from the way she used her voice and the quality of the sound. Besides, Noa also asked for feedback to improve her performance.

Different from most of Noa's other compositions; 'I am Rose' was first created without any form of music notation. After Noa was satisfied about the auditory result of the composition, attention was paid to write down the music (see figure 3). At the end of the session, Noa was satisfied about both music and the way it was written down.

I am Rose my eyes are blue

you?

I a...mmm *Rose* and who a

r

e

Figure 3: First sentence of the poem/ composition 'I am Rose', text: Gertrude Stein (2007).

Session 4, composition: *Exercise No.2*. Noa brought her recorder to the fourth composition session. She announced during session 3 that she wanted to bring this instrument to the next session. In session number two Noa and her teacher worked with rhythm flashcards. The teacher had prepared melodic flashcards for session 4 (see figure 4). These flashcards contained melodic phrases that were only possible to play for Noa after little practicing. The melodies were first practiced in an auditory way. Then the music notation was introduced. Just like in sessions before, music improvisation was part of this session.

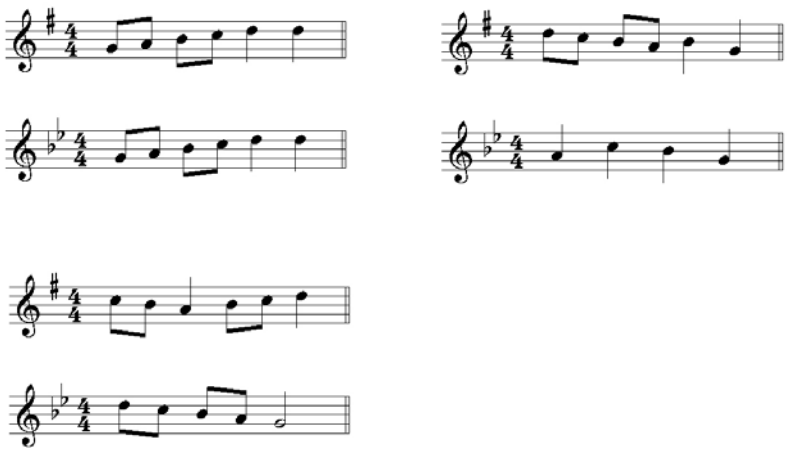

Figure 4: Six examples of melodies notated on flashcards, three in G-major, three in g-minor.

When Noa was able to play the first series of melodies in G-major, a new series of melodies was introduced. This series was not quite new: the series of first melodies was now introduced in g-minor. Although Noa had some trouble to master the latter series in the beginning, finally she was able to play all melodies in both major and minor. Noa was asked to compose a piece in an AABA-form. Based on prior experiences with flashcards and the aspects learned in session 2, Noa composed a piece in the form that was asked. She, however, was not satisfied with the B-part, so she experimented (much longer than for the A-part) with several options before making her final choice. In the end her teacher played a simple accompaniment on

chimes. Noa was asked which harmony (in her opinion) suited best to the melody. In fact she not only composed the melody, she also added the right chord progressions (I-V-I in major and minor, see figure 5).

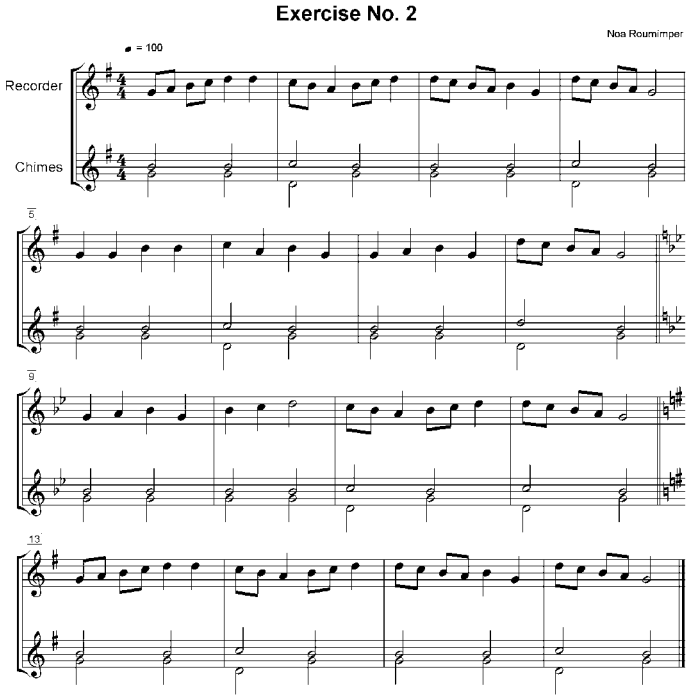

Figure 5: 'Exercise No. 2'

Session 5, composition: *GarageBand1*. Being surrounded by popular music and living in a world in which information and communication technology no longer can be ignored, the introduction of the Apple software GarageBand was well received by Noa. This computer software offers people the opportunity to make a music composition based on audio samples that are available in the program. Noa and her teacher explored the basic possibilities of the program together. They listened to the available audio samples and discussed how a pop song is constructed. The focus of this discussion was on the texture of music compositions (drums, bass, chords played on keyboards and/ or guitar, brass instruments, synthesizers, melody). Also several musical forms were discussed, like a pop song, and classical form such as rondo, and canon. Based on the music Noa listened to during the beginning of the current session, she started composing a one-minute piece of music. The many possibilities offered by GarageBand made it impossible to make a complete composition that satisfied Noa. Looking back on the process of this session the teacher concluded that he should have given more clear cues in the composition process. The session was successful with regard to objectives learned (see table 1), but not with regard to being able to create a complete satisfying composition in one hour.

Session 6, composition: *Pentatonic Vocalize*. This session started with showing Noa a small musical box. Such boxes intrigue many children. The teacher also showed Noa a mechanism of a musical box for which one can make a composition by making holes in a strip of carton. Complicating part is how to compose a melody for this musical box. Once a hole is made in the strip of carton the chosen tone is final. Working by trial and error is no option. The teacher offered Noa a set of chime bars in a pentatonic scale. Noa and the teacher both improvised on these chime bars. Noa experienced how to create a musically logical melody, taking into account the tension of a melody. Improvising pentatonic melodies, Noa created an eight-bar melody she was satisfied with. Subsequently, she constructed the carton strip for the musical box. Noa was excited about the result. The teacher introduced the idea of creating a canon/round. It is difficult to make such a piece for a musical box, but can be executed by scoring the music with notation software like Sibelius. Still playing with the musical box and scoring the notes in the computer, Noa asked her teacher what would happen if she would put the strip backwards in the musical box. The teacher encouraged her to listen what would happen. The result was surprising for her, but according to Noa, not as nice as the original melody. Noa repeated this experiment four times. The experiment offered the teacher the possibility to tell Noa about several canon techniques used, like inverse, retrograde, et cetera, used from the fourteenth century till now. Something the teacher would not have done if Noa would not have taken the initiative to experiment with the musical box. The teacher also introduced the phenomenon of a vocalise. Noa and the teacher listened to a 'Vocalise' written by Rachmaninoff, Opus 34 (last song of the Fourteen Songs, 1912). The teacher assisted Noa to compose the end of the four-part (canon) vocalize (see figure 6). Instead of the regular length of a music composition session of one hour, the current session lasted 90 minutes. The composition of this pentatonic vocalize was quite a challenge for Noa and her teacher.

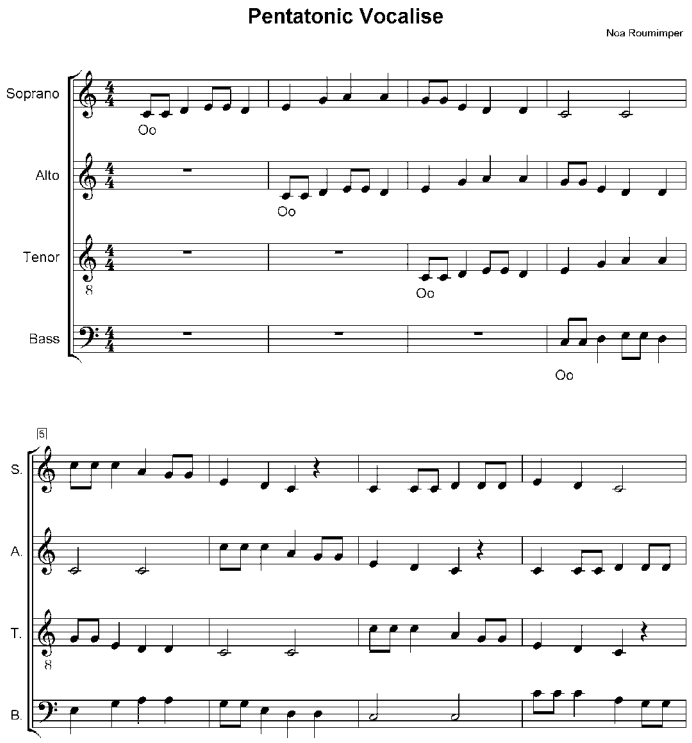

Figure 6: 'Pentatonic Vocalize', first 8 bars

Session 7, composition: *Jarig [Birthday]*. Intrigued by books and musical notations, Noa came up with the idea to make a new composition based on a poem like she made during the third session, but wondered if she could add instruments. The teacher showed Noa an example of composition like this in a textbook for secondary schools: 'Stemming voor de basisvorming' [Mood[3] for the lower grades of secondary education] (de Boer, 1994). Noa and her teacher first performed the composition 'De Grijze Poema' ['The Gray Puma'] from the above-mentioned book. Inspired by this composition, Noa chose a Dutch poem to make her own music composition. First, she explored possibilities to declaim the poem. Second, she experimented with several instruments. Some of them, like the cabasa and the flexatone, Noa never saw before, therefore the use of these instruments was explored in order to get the most beautiful and/ or useful tones out of them. The next steps were to combine the poem and the use of the instruments, and to write down the music composition. For this composition, Noa chose a combination of graphic and pictorial notation (figure 7). Noa searched and found the appropriate graphics herself on the internet.

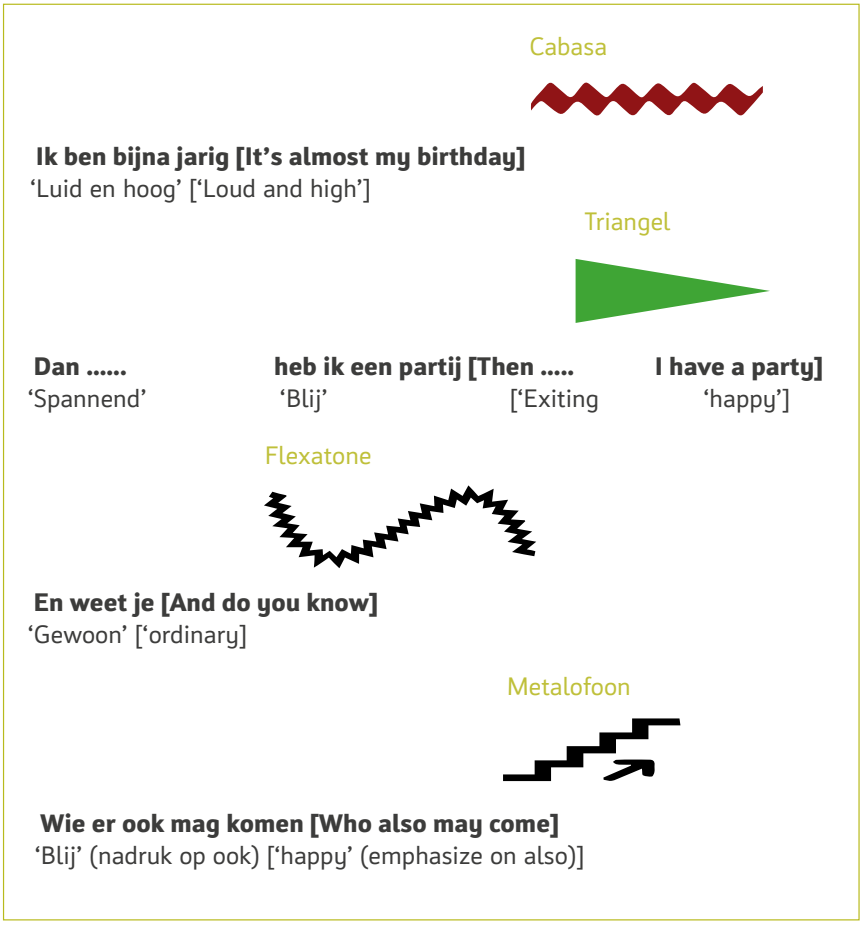

Figure 7: Fragment of 'Jarig', text by Hans and Monique Hagen (2006)

Session 8, composition: *GarageBand 2, version 3*. During session 5 the music software GarageBand was introduced for the first time. Noa was not quite satisfied by the result of the first GarageBand session. Also the teacher came to the conclusion that he should give more impulses to the composition activity in order to make this process, in which music technology was used as a creative tool, into a success. They started this session listening to two rondos: one rondo for piano by Mozart (KV 331) and one for wind ensemble by Hindemith (Kleine Kammermusik, Opus 24, No. 2). Although both rondos were classical, Noa was asked to make a rondo in pop style. This time Noa was determined to use certain samples she explored during the fifth session. It was interesting to see her knowing exactly what she liked and didn't like. This could have to do with the fact that she is familiar with pop/ rock music, but she was also very well able to articulate her reasoning. However, compared to the first GarageBand session, her teacher had a more directive role in the ongoing music composition. Noa appreciated this because collaboration helped her to improve her composition which made her Rondo much more satisfying than the result of the first one-minute GarageBand composition. The rondo composed had an ABACADA-form and was emailed to Noa's parents. Both Noa and the teacher were enthusiastic about the result.

Session 9, composition: *Ostinati*. The ninth composition session started with listening to 'The Watermelon Man' by Herbie Hancock (1962). In this piece, several layers of sounds and rhythms were stacked upon each other. In earlier sessions the term ostinato was introduced. Although Hancock didn't use ostinati in a strict sense, it was an interesting and useful starting point for a next music composition based on ostinati. Eleven Orff and Latin percussion instruments were introduced and rhythms were modelled, copied, and improvised. The next step was the teacher scoring rhythms played by Noa. This happened as Noa was satisfied with these rhythms. Noa and her teacher used the music notation software Sibelius to copy and paste the scored rhythms in a, for Noa, interesting order. Although the use of Sibelius was difficult for Noa, with assistance of her teacher she managed to make a composition that doesn't only look interesting and maybe even difficult for a 10-year old. Noa was also satisfied about the sounding result. This could not only been seen from the fact that she told she was satisfied, but also from the fact that she wanted to listen to her own work over and over again.
Session 10, composition: *Blues*. During the final session 'Night Train' by Hammond organist Jimmy Smith was listened to. The basic blues scheme is a very clear form, containing 12 bars. Noa first played an accompaniment on metallophone while the teacher improvised a melody. This accompaniment was scored in Sibelius. The accompaniment was extended with percussion instruments. Playing new rhythms on new instruments, new parts were scored as Noa was satisfied about the result. Like 'Ostinati' (session 9) this composition grew by adding new parts. The tempo in which Noa was able to create new ideas, make decisions on what to use and what to exclude, and being able to write music down increased during the ten sessions she worked on her music compositions. Finally, Noa composed a simple melody (figure 8). This last composition was recorded and sent to Noa's family members.

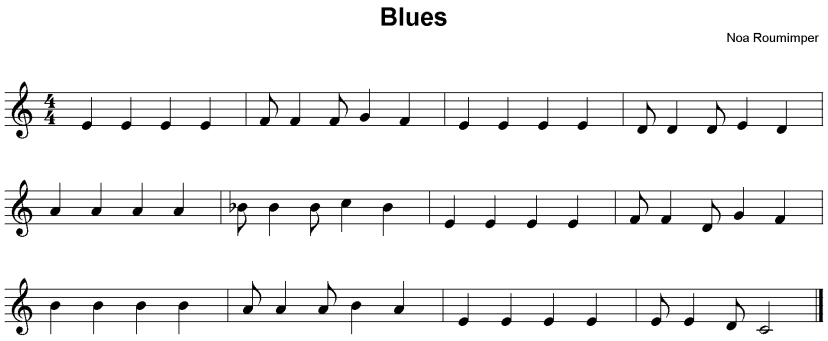

Figure 8: Blues, melody

6.4.2 Questionnaire and outcomes of the semi-structured interviews

A questionnaire was administered at the end of the study to inquire the effect of music composition on Noa's engagement in music education. This questionnaire (see appendix) contained 16 statements and was identical to the questionnaire that was administered in a school situation (Hogenes, Van Oers, Diekstra & Sklad, in press). The reliability of the questionnaire is highly satisfactory (Cronbach's alfa α = .96). The first statement of the questionnaire concerned working with other children. This statement was withdrawn because this study is single subject study.

The outcomes of the questionnaire, combined with the outcomes of the interviews with Noa, observations and analysis of Noa's compositions are displayed below. They are distributed in 4 parts: music notations, music listening, music composition as an activity, and model for music composition.

6.4.2.1 Music notations

Noa strongly agreed on a question whether the learning of notes (absolute staff notation) and graphical notations had helped her to understand music better, or not. She said: *"Using the different kinds of music notation, I learned more and more about rhythms and melodies. In the beginning, I just made sounds, but after a while I started thinking about what I did and how I could write my own music down."* Observations showed that activities involving language were easy to learn for Noa. The learning of staff notation or other forms of music notation were challenging for her and contributed to her understanding of music (sound, form and meaning). The difficulty of Noa's music compositions increased during the 10 weekly sessions.

6.4.2.21 Music listening

Noa agreed on the statement: "I became curious to how music is constructed by listening to music." Observations (described above) showed that Noa liked active music making more than listening to music. Although she liked listening to music and participated enthusiastically in listening activities, she preferred making music.

6.4.2.3 Music composition as activity

Noa strongly agreed on the statement whether her curiosity has been raised with regard to how music is constructed by composing music herself. She disagreed on the item: *"During the composition activities we had to solve real musical problems."* However, she regarded this item difficult. The activities offered to Noa were experienced as real music activities with increasing complexity. The activities were judged as real. Noa disagreed on the question regarding the limited space for her own ideas in activities. She said the activities were not too structured. She could be creative in solving problems her own way. She didn't experience the composition activities as assignments. They had playful characteristics with lots of freedom within constraints. Noa judged the activities as clear, although the final result was open. Noa said: *"Sometimes I knew what we were going to do during a session. Sometimes it was a surprise. The funny thing was that often when I thought I knew what we were going to do, the session was way different from what I thought it would go. It was like we played with the music."* Although Noa experienced the music composition process as play, the teacher had set educational goals. Noa had sufficient space for own ideas. That she experienced this as such is shown in the satisfaction of her compositions.

6.4.2.4 Model for music composition

Noa strongly agreed on the item: "It was easier to start composing music after making or listening to music." This can also be seen in the results of the compositions, as elements of the music that was listened showed up in Noa's compositions, for example the accompaniment of the Blues Noa composed. She first added the parts she heard in the music by Jimmy Smith. After that she added complementary parts that were not in Jimmy Smith's 'Night Train'. She said she would not have preferred to start composing without music making or listening to music first. Creating a common base, or like in a single student situation creating a base from which music composition can start, is a necessary condition to create a music composition with clear goal. Noa said she needed this base in order to get started. She also agreed on the item: "Most of the time we could improve our compositions by looking at our compositions (revision) together with the teacher." Working together as student and teacher offered the teacher opportunities to give impulses to the composition process. Noa confirmed that revising her compositions had major impact on her composition and the process towards a final version.

6.5 Conclusions and recommendations

This article shows that music composition, even when it is an increasingly complex activity, is an activity accessible for children in the elementary school age. Music composition organized according to the activity format of play offers children the chance to actively produce music, instead of reproducing music, in activities characterized by determinants that form the play format: rules, degrees of freedom, and engagement.

Despite the increasingly demanding activities, Noa showed to be highly engaged in music education (see e.g. compositions 2, 3, 6 & 9), specifically in music composition activities formatted as play. In this guided process she also showed an increase in music skills and knowledge (see e.g. compositions 4, 8 & 10). This made Noa feel proud of her own work. She

was highly motivated and articulated the wish to come the next week again to make a new music composition. For her teacher, it was challenging and rewarding to offer Noa assistance to make the best possible progression. Comparing the outcomes of this single-subject case study with the outcomes of the comparative classroom study (Hogenes, Van Oers, Diekstra & Sklad, in press) in which music composition in classroom situations was studied, remarkable differences could be found. The same three-step-model was used in both studies. Although, the music compositions in the classroom study were musically interesting, Noa's compositions were much more complex and, judged by her teacher, richer concerning musical ideas, structure and notation. It was more difficult to revise music compositions with a class as a whole, while in a one-on- one situation the teacher is easily able to give impulses to the process that lead to significant improvement of the music compositions. In a classroom situation it would be very difficult to make a composition like Noa's Vocalise (composition 6). Not only was the lesson plan highly influenced by Noa in her role of composer, for composing the last few bars of the Pentatonic Vocalise Noa needed a lot of feedback and help to finish her composition. It would be impossible to give the same amount of time and attention to individuals or small groups of children in a classroom situation.

Music composition in schools can be seen as an activity that takes place in a collaborate activities. Noa learned from her teacher, but also brought experiences and (present) knowledge to the music composition sessions. The teacher was the more knowledgeable partner in the teaching/ learning process. He, however, also learned from Noa, for example how to scaffold the revision process, and adjusted his lesson plans based on the creativity Noa showed during the sessions.

Based on these observations, the authors conclude that music composition can be expanded in elementary school age under appropriate guidance. The single-subject study demonstrated that complex composition activities in which the pupil is allowed to follow personal interests and receives action-focused guidance, leads to intense engagement in music education and high music achievements (in terms of musical products and skills). In this process, Noa has shown herself being a real (10-year old) composer.

They also conclude from this case study that conducting music composition activities as a regular classroom activity may be claimed. Music composition is an activity accessible for elementary school children. The used music composition model based on the cultural-historical activity theory, and implemented in a play format offers regular classroom teachers possibilities to guide music composition in elementary schools. However, to offer all children the assistance they need, working in small groups is suggested. ■

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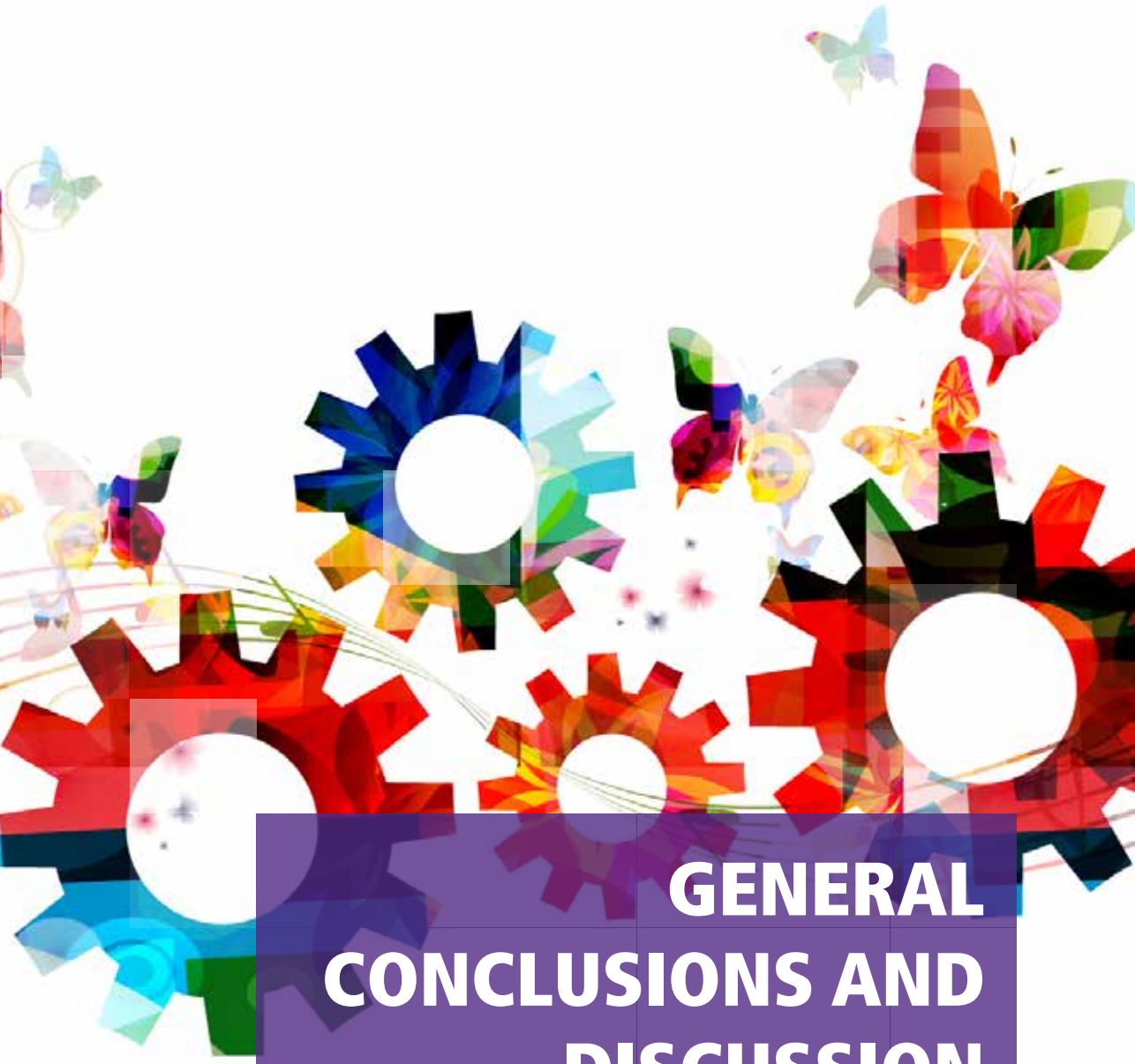
Endnotes

1 Field notes and audio recordings, as well as the questionnaire can be requested from the first author.

2 Idem

3 The Dutch word 'stemming' can be translated as 'mood', but also as 'tuning'.



GENERAL CONCLUSIONS AND DISCUSSION

7. GENERAL CONCLUSIONS AND DISCUSSION

7.1 Introduction

This final chapter ties together the findings and conclusions of the separate studies in this doctoral dissertation for a comprehensive reflection. In the first section below the research questions are repeated. In the following sections these questions are addressed by providing a chronological summary of the findings of each study. Finally, some remarks on educational theory and practice are made, as well as proposals for further research.

The overall research questions were the following:

1. What are the empirically demonstrated effects of music education on social, emotional, cognitive and motor functioning of children?
2. How can musical activities for children be conceptualized as playful activities that establish optimal conditions for (musical) learning outcomes?
3. What are the effects of music composition as a classroom activity on engagement in music education and on academic and on music achievement?

The studies reported in this doctoral dissertation contribute to the 'body of knowledge' regarding music production (i.e. composing music) in contrast to music reproduction (performing music of others) in education. The research in this dissertation project shows that elementary school students benefit from music composition as a form of music production. The quasi-experimental study (study 4) demonstrated positive effects on students' engagement in both music production and music reproduction, but greater effects in the music production condition. This confirmed the hypothesis that music production would lead to more engagement in students than music reproduction.

However, music composition is an underexposed form of musical behavior in most Dutch elementary classrooms. A paradigm shift from music reproduction to music composition (production) may lead to a form of music education that engages students in musical activities that they experience as their own music, and hence music that makes personal sense to them. Therefore, inspirational teaching resources that focus on music composition are needed to provide teachers with the tools to develop meaningful music composition activities. As productive music education is evidently more engaging for students than reproductive forms of music education, both general classroom teachers and music specialists need pedagogical, didactical, organizational and reflective skills different from the usual skill needed for reproductive music education. For music production, skills such as being able to use forms of cooperative learning and being able to apply differentiated instruction are required. This has consequences for general (classroom) teacher education [pabo's] as well as for music in education courses [Docent Muziek] at conservatoires. Teacher education students should be educated in music composition, alongside musical domains such as singing, instrument play-

ing and listening to music. They need to experience being young composers themselves and therefore need to acquire skills necessary to scaffold 'the child as composer', without impairing the play quality of this type of activity.

7.2 Summary of the results

7.2.1 The impact of music on child functioning (Study 1)

As a first step in this research project, we found it necessary to review the available evidence for the impact of music on child functioning. Hence the question addressed in study 1, a narrative literature review, was: "What are the empirically demonstrated effects of music education on social, emotional, cognitive and motor functioning of children?"

In the literature, music and music education are assumed to have a positive impact on school achievement, intelligence and children's social-emotional functioning. The main purpose of this study was to examine the assumption of many musicians and music educators to see whether these findings find support in empirical studies.

After examining 21 studies, we could conclude that overall child functioning is positively affected by music exposure as well as by music education. Most convincingly, this is demonstrated with regard to cognitive functioning, as 15 out of the 21 studies examined reported significant positive outcomes. The results of this study also showed that music exposure and music education have moderate to substantive effect on interpersonal problem solving, interactions in the classroom, and the ability to reflect upon social situations. However, as only two studies focused on these abilities, conclusions have to be drawn with great caution. The same applies to the effect of music education on motor functioning. The two studies that met the inclusion criteria showed positive effects.

7.2.2 Playing music. A perspective on music education using the Cultural-Historical Activity Theory of learning and development. (Study 2)

Study 2, a theoretical study, reflected on possibilities for a play-based music curriculum and addressed the topic of musical play from a theoretical point of view. Play, and specifically musical play, has been studied extensively. It has been a research topic in the past, as it still is today. Niland (2009) states that children have a natural inclination to sing and play. These activities form a vital part of their musical development. However, play can also be seen as a particular way human (cultural) activities may be carried out (van Oers, 2012). In this study, the following research question was addressed: "How can musical activities for children be conceptualized as playful activities that establish optimal conditions for (musical) learning outcomes?"

The question has been answered from the Cultural-Historical Activity Theory point of view. All human activities are cultural activities that can be accomplished in more strict and mechanical ways, or in more free and joyful ways. So can music activities. Musical play is a mode of activity defined by three parameters: technical and musical rules, degrees of freedom, and high involvement.

Traditional forms of music education that focus on training for strictly rule-regulated performance can be seen as essentially reproductive forms of music education. Educational activities, on the other hand, can be considered productive and playful when they succeed in engaging students in music activities that relate to their interests, building on rules that can be acknowledged by the students, and allowing the students freedom in interpreting the rules, goals and forms of performance. Like in many other subject matter domains, music education can take the step from a reproductive approach to a more productive one. Although there are many music activities that allow for playful versions, we argue here that *music composition* activities in particular follow the play format of activity and offer children opportunities to be creative, to create their own music.

Music composition can already be offered as a playful activity in elementary schools. Children are able and want to participate in such activities and actively appropriate musical skills and knowledge while creating their own music. However, they need assistance to improve their ability to participate in cultural practices such as music composition practices.

When music composition is introduced in the classroom as a playful shared activity, classroom teachers and music specialists can participate and motivate, stimulate and facilitate students as more knowledgeable partners in working on challenging compositions. This may stimulate the emergence of new needs, especially needs for new musical concepts, and development of musical skills. However, further research should be conducted to create and test models of music composition with children in the elementary school age, such as models that cover a broad spectrum of music styles from urban dance music to a more classical idiom. Further comparative research should also be conducted into models that differ with regard to instruction: from a teacher-centered approach to a student-centered approach. As an instruction model, music composition is not necessarily always a creative and playful activity. It can be addressed as a strict and mechanistic activity without much ownership by students, but also an activity in which students have – within constraints – a certain degree of freedom to express themselves, which gives them the opportunity to have intense musical experiences.

As music education in the Netherlands focuses foremost on the reproduction of music rather than the production of their own pieces of art, the outcomes of the second study of this research project urge further theoretical exploration of music composition as an educational activity, in which the possibilities to regard children as composers are explored.

7.2.3 Music composition in the music curriculum (Study 3)

The question that was addressed in the third study was: "How can elementary school students be meaningfully engaged in music composition activities?" This theoretical study implicates, according to a basic assumption of the Cultural-Historical Activity Theory, that the drive for students' creative involvement in cultural practices can be found in the desire of children to be part of and to participate in the world of adults. This is their incentive for development and learning. Based on an activity format of play, as described in study 2, 'composing' can be construed as a playful cultural practice following some musical rules, allowing the participants some degrees of freedom and raising high levels of personal involvement. Through playful participation in a composing practice with experts, newcomers can test, learn and improve the rules and appropriate relevant knowledge and skills. From this point of view, we conceive

of the composing process as a planned and deliberate realization of a creative process with a new piece of music as the outcome (Campbell & Scott-Kassner, 2006). A basic pedagogical implication of music composition as a regular playful classroom activity is that the participating and guiding expert (teacher) should never impair the quality of the activity as play, i.e. the expert should abide by the characteristics of the activity format of play—rules, degrees of freedom, and intense experience. The article describes a pedagogical model consistent with this play-based approach as a three-step model, in which step 1 is the creation of a common base, step 2 is creating ideas and writing the composition, and step 3 is the presentation and publication. An important part of the process is the revision phase, part of step 2. In this phase, the teacher focuses on the goal to make students think about their compositions and to help them improve their compositions. This model is adopted from a successfully developed and trialled text composition program.

Using this model for music composition, every classroom teacher should be able to work with students on music composition. It offers classroom teachers tools to motivate, stimulate, and facilitate students in working on challenging assignments, which may raise the needs in students for more musical knowledge and skills. The presumed potential of this pedagogical model is that it can enhance meaningful musical learning in elementary school students. The efficacy of this theoretically construed claim can only be verified by further empirical research in which the model is implemented in everyday elementary classrooms.

The next section describes a study in which we tested the effects of the application of the model described above.

7.2.4 The effects of music composition as a classroom activity on engagement in music education and academic and music achievement: A quasi-experimental study (Study 4)

Two research questions have been addressed in the fourth study: 1. "What differences exist between the effects of a music education intervention based on music composition as a classroom activity versus a music education intervention based on a teacher-centered approach mainly comprising reproduction of music on *students' engagement* in music education?" and 2. "What differences exist between the effects of a music education intervention based on music composition as a classroom activity versus a music education intervention based on a teacher-centered approach mainly comprising reproduction of music on *intelligence, academic achievement, and musical achievement*?"

The overall results of this quasi-experimental study comparing two types of music education, an intervention that emphasized music production by composition and an intervention with an emphasis on music reproduction showed the following. First of all, the study demonstrated positive effects on students' engagement in both types of music education, but greater effects in the music production condition, which confirmed the hypothesis that music production would lead to more engagement in students than music reproduction ($F(1.121) = 1805.29$, $p < .001$, partial $n^2 = .937$). Secondly, this study did not support the hypothesis that music education as such contributes to nonverbal intelligence. No differences in this respect were found between students in the music production condition versus students in the

reproduction condition. This deviated from the findings reported by Bastian (2002) in which significant positive effects of music education on intelligence were reported. Thirdly, the findings of this study partly confirmed the hypothesis that the students of the experimental group would perform better with regard to academic skills than the control group; at least, such an effect was found for reading comprehension, although the effect size was low ($F(1.112) = 7.42$, $p < .007$, partial $n^2 = .06$). It remained uncertain to what this difference should be attributed. One possibility was that students in the experimental group made extensive use of symbolic notation and were more focused on the text-like dimensions of their compositions. A transfer to reading comprehension could have taken place. Fourth, although both groups showed progress with regard to singing, no significant difference between both groups was found in this respect, despite the fact that the control group sang much more than the experimental group. This might indicate, since relevant variables here are melody and rhythm performance as well as expression and comprehensibility, that these can apparently also be improved by non-singing music activities.

In conclusion, this study highlighted the surplus value on several dimensions of composition as a classroom activity, namely on engagement and on one academic ability: reading comprehension. This study has shown that music composition is feasible and useful in elementary school. Students are able to compose music in the same way as they are able to sing songs, play instruments, and perform dances. From this study it can be concluded that productive music education is evidently more engaging for students than reproductive forms of music education.

One of the parts of the music composition process, namely the revision of a music composition, proved to be difficult in a classroom with 22 students. It is complicated to give all students the attention and feedback they need to improve their music compositions, music skills and knowledge. In order to get a better insight into the music composition process in general and more specifically in the revision phase, a fifth study was conducted: a single-subject case study with a 10-year-old girl named Noa.

7.2.5 Noa, a 10-year-old composer: A single-subject case study (Study 5)

Finally in study 5, the following research question was addressed: "What are the effects of closely guided music composition in which the revision of the compositions is particularly emphasized, on engagement in music education and music achievement in a single-subject situation."

This study showed that music composition, even when it is an increasingly complex activity, is an activity accessible for children in the elementary school age. Music composition that is organized according to the activity format of play offers children the chance to actively produce music, instead of reproducing music, in activities characterized by determinants that form the play format: rules, degrees of freedom, and high engagement.

Despite the increasingly demanding activities, Noa – the single subject – showed to be highly engaged in music education, specifically in music composition activities formatted as play. In this guided process she also showed an increase in music skills and knowledge. This made Noa feel proud of her own work. She was highly motivated and each time articulated the

wish to come again the next week to make a new music composition. For her teacher, it was challenging and rewarding to offer Noa assistance to make the best possible progression. Comparing the outcomes of this single-subject case study with the outcomes of study number 4, in which music composition in classroom situations was studied, remarkable differences could be found. The same three-step model was used in both studies. Although the music compositions in the classroom study were musically interesting, Noa's compositions were much more complex and, as judged by her teacher, richer concerning musical ideas, structure and notation. It was more difficult to revise music compositions with a class as a whole, while in a one-on-one situation the teacher is easily able to give impulses to the process that lead to significant improvement of the music compositions. In a classroom situation it would be very difficult to make a composition like Noa's vocalise. Not only was the lesson plan highly influenced by Noa in her role of composer, she required a lot of feedback to help compose the last few bars of the Pentatonic Vocalise. It would be impossible to give the same amount of time and attention to individuals or small groups of children in a classroom situation.

In conclusion: Noa demonstrated that music composition activities can be carried out by elementary school students. However, it is difficult for a teacher to revise music compositions in a classroom situation. Noa showed that revising music compositions in a one-on-one situation can lead to musically rich compositions, which in turn indicates that composing music with small groups of elementary school students can be achievable. Noa learned from her teacher, but also brought experiences and (contemporary) knowledge to the music composition sessions. The teacher was the more knowledgeable partner in the teaching/learning process. He, however, also learned from Noa, for example how to scaffold the revision process, and adjusted his lesson plans based on the creativity she showed during the sessions.

Based on these observations, and taking into account the so called 'funds of knowledge' (Moll, Amanti, Neff, and Gonzalez, 1992) that might have contributed to the results shown by Noa, the authors concluded that music composition can be implemented in elementary schools, provided that the appropriate guidance is available. The single-subject case study demonstrated that complex composition activities in which the pupil is allowed to follow personal interests and receives action-focused guidance, leads to intense engagement in music education and high music achievements (in terms of musical products and skills). In this process, 10-year-old Noa has shown herself to be a real composer.

From this case study is concluded that conducting music composition activities as a regular classroom activity may be claimed to be feasible. Music composition is an activity accessible to elementary school children. The used music composition model, based on the Cultural-Historical Activity Theory and implemented in a play format, offers regular classroom teachers possibilities to guide music composition in elementary schools. However, to offer all children the assistance they need, working in small groups is suggested.

7.2.6 General conclusions

The main aim of this research project was to investigate the impact of music on cognitive and social-emotional functioning of elementary school students, as well as the essential question regarding music education, namely: "What type of music education leads to increasing levels of engagement in music activities in elementary school students?"

Generally speaking, we could conclude that child functioning is positively affected by music exposure as well as by music education. This conclusion is most convincingly demonstrated with regard to cognitive functioning. The studies that focused on social-emotional functioning, as well as the studies that reported on motor functioning also showed positive effects. However, as only two studies focused on these abilities, conclusions have to be drawn with great caution.

The theoretical exploration on the phenomenon of play has shown that human activities can be accomplished in more strict and mechanical ways or in more free and joyful ways. So can musical activities. Music play is a mode of activity defined by the three parameters of the activity format: rules, degrees of freedom, and engagement/involvement. Music education activities can be considered productive and playful when they succeed in engaging students in musical activities that relate to their interests, building on rules that can be acknowledged by the students, and allowing the students freedom in interpreting the rules and the forms of performance. Like in many other subject matter domains, music education can take the step from a reproductive approach to a more productive one. Although there are many music activities that allow for playful versions, this project argues that *music composition* activities in particular follow the play format of activity and offer children opportunities to create their own music. The quasi-experimental study at elementary school De Vijver in The Hague, as well as the case study "Noa, a 10-year-old composer", justify the conclusion that conducting music composition activities as a regular classroom activity may be claimed to be feasible, and may lead to increasing levels of engagement in music activities in elementary schools. Music composition is an activity accessible to elementary school children. The three-step model used in our studies, based on the Cultural-Historical Activity Theory and implemented in a play format, offers regular classroom teachers possibilities to guide music composition in elementary schools.

7.3 Limitations

The studies presented in this project are limited in certain ways. The first limitations concern the literature review. In summary, sweeping conclusions regarding robust effects of music exposure and education on cognitive, social-emotional and motor development are premature, as effects of music exposure and music education either appeared to be short-lived or no follow-up data on the sustainability of effects were available. The studies that were reviewed differed widely in terms of design, music intervention and measures applied. Besides, the used sample sizes were generally small. This does not mean that the reported outcomes of the reviewed studies are not trustworthy, but the present state of research has not been able yet to identify such effects in a reliable, valid and sustainable manner. Apparently, until now empirical studies have not been able to answer the essential questions regarding music education, namely: *"What kind of music education leads to increasing levels of engagement in music activities in elementary schools?"* and *"What should be the frequency and duration of music activities in order to be effective?"*

There are also some limitations with regard to the quasi-experimental study (study 4). First of all, randomization was only possible at a class level and not at the level of students or

school. Secondly, the same teacher carried out both interventions. A possible proclivity towards one or the other approach to music education cannot be excluded as having affected the outcomes. In order to exclude this possible experimenter bias, objective and validated tests were used. These tests have been conducted in accordance with the applicable rules. In order to assess singing and music listening, new tests have been constructed and two music teachers checked the outcomes of these tests. For singing an acceptable inter-rater reliability was found. Thirdly, it can also not be excluded that differences between both conditions had to do with factors other than the presence or absence of composition as an activity. For example, music composition may require forms of interaction between teacher and students that are different from reproductive music activities. For instance, in music composition activities students get more feedback individually and in small groups than in music reproduction activities where the class is addressed as a whole. Further studies are needed to single out the precise effects of different factors on different students in a variety of forms of interaction.

The limitations mentioned above also apply for the single-subject case study (study 5). It was said that Noa's compositions were much more complex and, as judged by her teacher, richer concerning musical ideas, structure and notation than the music composition made in classroom situations in study 4. It was concluded that it was more difficult to revise music compositions with a class as a whole, while in a one-on-one situation the teacher is easily able to give impulses to the process that lead to significant improvement of the music compositions. However, no musical ability or aptitude tests were used for study 4 and 5. It is possible that Noa was more talented in music than the evarage student participating in the quasi-experimental study (study 4). In general, it should be noted that students bring with them funds of knowledge from their homes and communities that not only can be used for the development of academic and musical skills, but also can have differential effects on their musical development (Moll et al, 1992). The outcomes of studies 4 and 5 are, apart from the effects of the interventions, a reflection of the students' funds of knowledge.

7.4 Discussion: Desiderata for the future

The studies conducted in this research project raise new questions that should be addressed in future research. The current research project examines the impact of music education in general on social, emotional, cognitive and motor functioning of children, and more specifically, the effects of music composition as a classroom activity on engagement in music education and academic and music achievement. It contributes to the 'body of knowledge' regarding music production as a fruitful educational practice. The fact remains that a number of important questions still need to be answered. In conclusion of this doctoral dissertation, and as desiderata for research and theory in the near future, the main issues will briefly be discussed below.

7.4.1 Teacher education

Music composition is an underexposed form of musical behavior in most Dutch elementary classrooms, as well as in teacher education. A paradigm shift from music reproduction to music composition (production) may lead to a form of music education that engages students in musical activities that they experience as their own music and hence music that makes per-

sonal sense to them. However, productive music education requires teachers to have different pedagogical, didactical, organizational and reflective knowledge, as well as other skills and attitudes than one would have for reproductive music education. For example, using forms of cooperative learning and differentiated instruction. This has consequences for general (classroom) teacher education [pabo's] as well as for music in education courses [Docent Muziek] at conservatoires. Teacher education students should be educated in music composition. They need to experience being young composers themselves and therefore have to acquire skills necessary to scaffold 'the child as composer', without impairing the play quality of this type of activity.

7.4.2 Assessment of creative processes

Teaching music from a Cultural-Historical Activity Theory perspective values student-centered work primarily as opportunities for learning. Implementing composition activities in the elementary classroom calls for strategies to assess the learning outcomes, including the outcomes with regard to students' ongoing creation processes. Assessment of creative thinking in music should therefore be a major responsibility for teachers.

Creative thinking is considered a dynamic mental process, alternating between divergent and convergent thinking, enabled by a blend of imaginative thoughts with mastery of skills and knowledge that results in a final musical product, which is new for the creator. 'Thinking in sound' is critical to the success of music education (Webster, 2014). Central in this thinking in sound is the students' own music and own ideas about music making.

As music production and thereby creative thinking are central tenants in music, close observation and assessment of students' music composition and improvisation processes are essential. In order to assess students' own music abilities, knowledge and products (music compositions and improvisations) as well as students' own ideas about music making, student-centered assessment of creative processes is needed that involves sophisticated and complicated evidence for music learning. Dynamic assessment is a form of assessment for learning and assessment of learning that fits the CHAT approach of teaching and learning and could be valuable for the assessment of creative processes in music education in order to give new impulses to students' learning processes and to determine follow-up activities.

The term '*dynamic assessment*' was first used by Luria, a close colleague of Vygotsky. According to Sternberg and Grigorenko (2009), dynamic assessment can be described as an assessment approach that takes into account the results of an activity. This approach is closely related to Vygotsky's Zone of Proximal Development. Basically, dynamic assessment can be seen as a pedagogical instantiation of Vygotsky's Zone of Proximal Development with a particular focus on assistance/help (see Lantolf, 2009). In dynamic assessment approaches, instruction (as mediation) and assessment are dialectically integrated into a single activity. The use of dynamic assessment approaches in music education could be valuable because students can be assessed within music activities. It can, therefore, be a natural part of the teaching and learning process. The use of dynamic assessment as a tool for monitoring and guiding (creative) learning processes could be a new instrument to assist students in their musical development and evaluate their performances. The use of dynamic assessments could enhance music composition as a creative process.

7.4.3 Benefits of the use of technology in music education

Technology offers teachers supplemental teaching tools (Cross, 2012). Not only can tablets, apps, videos and interactive whiteboards be learning tools for students, they can also be additional teaching tools for (music) educators. The use of technology can stimulate students to become composers and make them more apt to learn when they interact with hands-on learning tools that various forms of educational technology provide. Moreover, students can learn at their own pace and place. This offers teachers opportunities to adapt more to students' needs.

Although most Dutch (elementary) students have access to computers, tablets and Internet, the use of music technology for music education use is very limited. Technology offers student opportunities to use online lesson plans, educational apps, interactive games, online videos and graphics and access to books and websites. Furthermore, music technology offers students possibilities to play and record music and to compose their own music (Brown, 2015). It is therefore worth conducting projects to study benefits of using music technology in creative processes, such as music composition and improvisation, to develop new teaching methodologies that involve music technology and advocate the use of these teaching methodologies.

7.4.4 Music education in conjunction with other (arts) subjects

Music education has been part of the Dutch school curriculum since the inception of convent schools in the 18th century. Although music is sometimes taught in conjunction with other subjects, it is not obvious to do this. Such concurrency may allow students to see a coherence between school subjects. Conjunction between arts subjects in school and arts outside school can cause contextual understanding of the content of arts lessons. Moreover, conjunction between arts disciplines and subjects is a reflection of a multidisciplinary arts world (Rass, 2008).

Barrett, McCoy & Veblen (1997) point at interdisciplinary connections between music and a host of allied fields in the arts and in other disciplines. This idea extends to intra-disciplinary as we consider music performance, music history, theory, and education in what seems at times to be a hopelessly intractable curriculum structure (Webster, 2014). Music education could be more meaningful for students when music is embedded in activities that include other arts subjects as well, and that allow young people to draw from their personal interests during music education. Research to inter- and intra-disciplinary practices can point at effective combinations of subjects, and therewith contribute to improve music and arts education practices.

7.4.5 Music that should be taught in elementary schools

An important issue in music education is the role of vernacular and world music as partners with western art music, as well as western popular and jazz music. *"When children and youth are led by teachers into experiences with music, they can discover gems of artistic and social expression, and sometimes even discover new meanings of the music that has always seemed so familiar to them …. In this time of global awareness, music is an aural pathway for understanding the world in which we live. It is a means of social and self-definition, and a bridge for young people from the self to others"* (Campbell, 2004, p.2).

Questions such as: "What kinds of music from the rich variety of music types that are available all over the world can be used to get children actively involved in music listening and actual music production in order to increase levels of engagement in music activities in elementary schools?" should be addressed from a music education, developmental psychology and ethological point of view in order to be able to develop development-appropriate activities that connect with needs and interests of students. Diversity in music education might be challenging, but enriches the musical reference from which students can start to compose their own music.

7.5 The child as composer

The results of this doctoral dissertation have some important implications for music education in elementary schools and (music) teacher education. It shows that music education organized according to an activity format of play leads to increasing levels of engagement in music activities in elementary schools.

Using the developed model for music composition, every classroom teacher should be able to work with elementary school students on music composition. Students can be motivated, stimulated and facilitated in working on challenging assignments, which offer students an insight into musical concepts and help to develop musical skills. Students can be seen as young composers who co-create the music curriculum they participate in. They can take pride in their own music and develop a sense of purpose (i.e. personal meaning).

Like Stanislavsky (1989) encouraged actors to profoundly live 'into' the role so that the part can be played as if an actor is momentarily *being* the character that features in the scene, and not just *pretending* to be it, students can themselves live into the role of composers. Instead of *pretending* to be composers, they *are* composers, in other words the child as composer. ■

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APPENDICES

ASSESSING MUSICAL FUNCTIONING QUESTIONNAIRE

MUSIC COMPOSITIONS BY NOA ROUMIMPER

ASSESSING MUSICAL FUNCTIONING

Appendix 1: Music listening

Protocol for the assessment of instrument and ensemble recognition

"We will listen to twelve short fragments of music. Eight fragments are played on solo instruments and in the four fragments that follow you will hear ensembles. Ensembles are groups of people playing instruments, singing in a choir, or a combination of people who sing and play instruments. I want to know whether you can mark the correct answers on the answer sheet.

I will tell you how the assignment works:

- Fragment one: On the answer sheet you see four instruments: a piano, a recorder, a drum kit and a violin. You will now hear fragment number one. Are you able to mark the instrument you'll hear? *[CD Track 1]*
- Who can tell me what instrument you heard? (Correct answer: piano).
- If everyone understands how this assignment works. We will continue with the next seven instruments. It can be that there are, for you, new, unknown instruments on the answer sheet. In that case you may guess.

- For fragment two, you can choose between timpani, udu drum, xylophone, and tubular bells. *[CD Track 2]*
- For fragment three, you can choose between four wind instruments: clarinet, flute, harmonica, and saxophone. *[CD Track 3]*
- For fragment four you, will have to choose between four kinds of keyboards: organ, piano, synthesizer, and harpsichord. *[CD Track 4]*
- In the following fragment, fragment number five, you will hear one of the following four "bass" instruments: bass guitar, tuba, trombone, or double bass. *[CD Track 5]*
- In fragment six, you will, again, hear a wind instrument. You have four options to choose from: flute, French horn, trumpet, and hobo. *[CD Track 6]*
- We have two more instruments to go. Fragment seven can be one of the following instruments: a saxophone, a piano, a cello, or a clarinet. *[CD Track 7]*
- For the last solo instrument, you can choose between guitar, piano, harpsichord, and harp. *[CD Track 8]*

- We have finished the solo instruments and will continue with four fragments with ensembles. Like I said before: Ensembles are groups of people playing instruments, singing in a choir, or a combination of people singing and playing instruments. Take a good look at all the pictures to see what instruments are part of the several ensembles.
- For the first ensemble, fragment nine, you can choose between: symphonic band, klezmer band, a choir, and a piano trio. *[CD Track 9]*
- The second ensemble can be a fanfare, a recorder quartet, a brass quartet, or a string quartet. *[CD Track 10]*
- For fragment eleven, you can choose between: accordion band, string orchestra, brass quintet, and piano ensemble. *[CD Track 11]*
- Then we'll continue with the very last ensemble. Which of the following four ensembles do you hear? Symphony orchestra, marching band, bagpipe band, or symphonic band. *[CD Track 12]*"

Instruments




Fragment 1

A Piano

B Recorder

C Drum kit

D Violin




Fragment 2

A Timpani

B Udu drum

C Xylophone

D Tubular bells




Fragment 3

A Clarinet

B Flute

C harmonica

D Saxophone




Fragment 4

A Organ

B Piano

C Synthesizer

D Harpsichord




Fragment 5

A Bass guitar

B Tuba

C Trombone

D Double bass




Fragment 6

A Flute

B French horn

C Trumpet

D Hobo




Fragment 7

A Saxophone

B Piano

C Cello

D Clarinet




Fragment 8

A Guitar

B Piano

C Harpsichord

D Harp

Ensembles




Fragment 9

A Symphonic band

B Klezmer band

C Choir

D Piano trio




Fragment 10

A Fanfare

B Recorder quartet

C Brass quartet

D String quartet




Fragment 11

A Accordion band

B String orchestra

C Brass quintet

D Piano ensemble




Fragment 12

A Symphony orchestra

B Marching band

C Bagpipe band

D Symphonic band

Correct answers

Instruments	1	Violin
	2	Udu drum
	3	Saxophone
	4	Organ
	5	Bass guitar
	6	French horn
	7	Clarinet
	8	Harp
Ensembles	9	Choir
	10	Recorder quartet
	11	Accordion band
	12	Symphony orchestra

Protocol for the Audiation Game

After: Music Audiation Games, by Edwin E Gordon

(Gordon, E.E. (2003). *Am I musical? Discover your music potential*. Chicago: GIA)

"We will listen to several fragments of music. I am very curious whether you can hear if a fragment is the same or different from the model fragment you will hear. I'll tell you how the game works:

- First we will listen to the model fragment. You will hear this fragment performed many times. But you will also hear other music fragments. The game is to decide whether the fragment you hear is the same or not the same as the model fragment. If you hear the model fragment performed, you will draw a circle around the word same on the answer sheet. If the song you hear is not the same as the model fragment, you will draw a circle around the word different.

- Let's see whether you have understood what I have been telling you. We'll start with an exercise. First you will hear the model fragment. Listen to exercise number one and mark your answer.
- If you drew a circle around different, this is correct, because what you heard was not the same as the model fragment.
- Listen to practice two, find exercise number two on your answer sheet, and mark your answer.
- If you drew a circle around same, this is correct, because what you heard was the same as the model fragment.

- Now we'll continue with the real game. Listen to the model fragment again to help you remember what it sounds like, but do not mark your answer sheet. Just listen.
- Listen to fragments one and two. Please mark the right answer on your answer sheet.
- Before we continue with fragments three and four, we'll listen one more time to the model fragment. Do not mark your answer sheet. Just listen.
- Please listen to fragments three and four, and mark the correct answers.
- In case you are confused we'll listen one more time to the model fragment. Don't mark your answer sheet.
- Please listen to fragments five and six, and mark the correct answers.
- Before you'll hear the last two fragments you will hear the model fragment for the very last time. Do not mark your answer sheet. Just listen.
- Please listen to the very last two fragments, numbers seven and eight. Mark the correct answers."

Answer sheet, audiation game

Audiation game

Exercise

Model Song	
1 Same	Different
2 Same	Different

Game

Model Song	
1 Same	Different
2 Same	Different
Modelfragment	
3 Same	Different
4 Same	Different
Modelfragment	
5 Same	Different
6 Same	Different
Modelfragment	
7 Same	Different
8 Same	Different

Correct answers

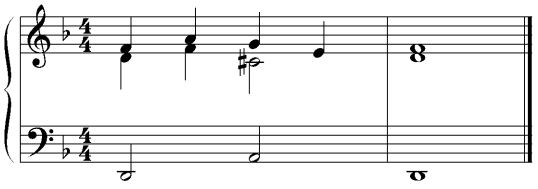
Exercise

Track 1 Model Song
Track 2 Different (melody & rhythm)
Track 3 Same

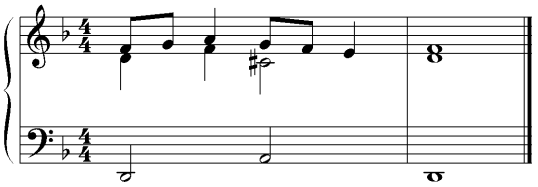
Game

Track 4 Model Song
Track 5 Same
Track 6 Different (harmony)
Track 7 Model Song
Track 8 Different (rhythm)
Track 9 Same
Track 10 Model Song
Track 11 Different (harmony)
Track 12 Different (melody)
Track 13 Model Song
Track 14 Same
Track 15 Different (melody)

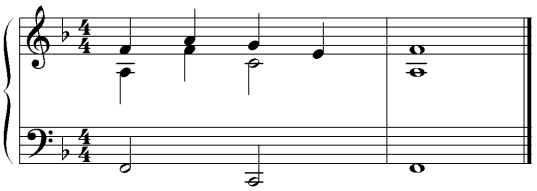
Track 1, 3, 4, 5, 7, 9, 10, 13 & 14, Model Song



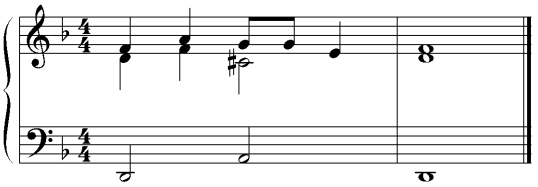
Track 2, Variation 1, melody & rhythm



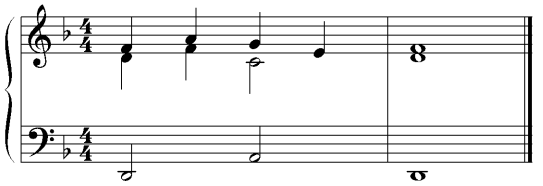
Track 6, Variation 2, harmony



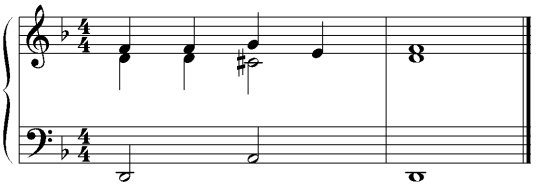
Track 8, Variation 3, rhythm



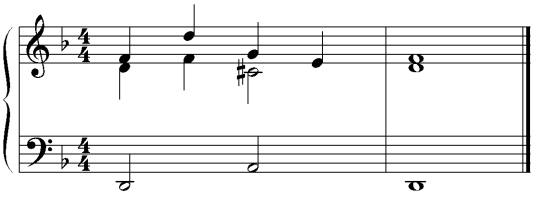
Track 11, Variation 4, harmony



Track 12, Variation 5, melody



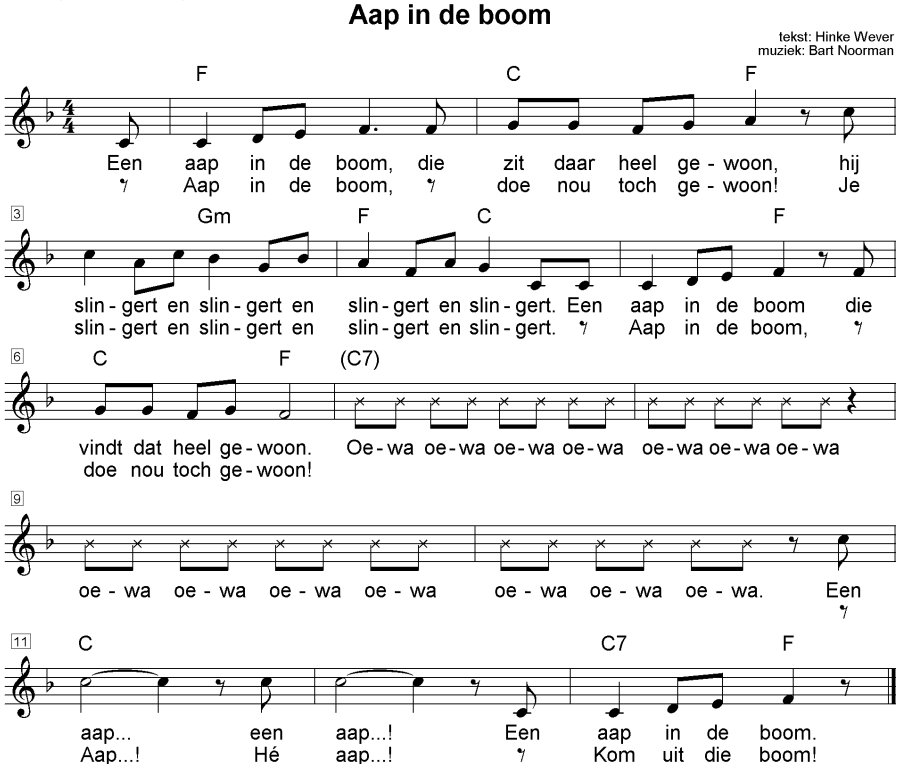
Track 15, Variation 6, melody



Appendix 2: Music making

Protocol for the assessment of Singing

"During the music lesson you learnt the song "Aap in de boom". In small groups of four students, you will sing this song for me. I'll videotape your singing and mark how you sing. My attention goes to whether you sing the correct melody, and rhythm, or not. Whether I can clearly hear what you sing, and to expression. First we will rehearse the song without filming and marking. Then you'll sing it for the second time, and I will record the song. You will have to sing as well as you can!"



Criteria

A) Melody
B) Rhythm
C) Intelligibility (verstaanbaarheid)
D) Expression

Marking

At this time the student ...

5 exceeds
4 consistently demonstrates
3 is developing
2 is beginning to develop
1 is unable to demonstrate
... competency at the task.

QUESTIONNAIRE 'DE VIJVER'

Music

Name: .....
Class: .....

Tick the box of the answer that is most suitable to your opinion.

QUESTIONNAIRE

1 I learned a lot by working together in groups of students.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

2 I got to understand music better by learning how to use notes (absolute notation).

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

3 I got to understand music better by learning how to use stripes and dots (graphical notation).

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

4 Using music notations doesn't help me to understand music better.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

5 I became curious to how music is constructed by listening to music.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

6 I became curious to how music is constructed by composing music myself.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

7 My curiosity has not been raised to how music is constructed, by composing music myself.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

8 During the composition assignments we had to solve musical problems I don't think occur in real music.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

9 The composition assignments we got were highly structured. We could just follow the manual instead of being creative in solving problems our own way.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

10 It was easier to start composing music after making or listening to music.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

11 I would have preferred to start composing music without making or listening to music first.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

12 Most of the time we could improve our compositions by looking to our compositions (revising) together with the teacher.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

13 Revising our compositions was time consuming and had only little impact on our compositions.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

14 I had to solve "real musical problems" while I composed music myself.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

15 There was lots of "space" for my own ideas in the music classes.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

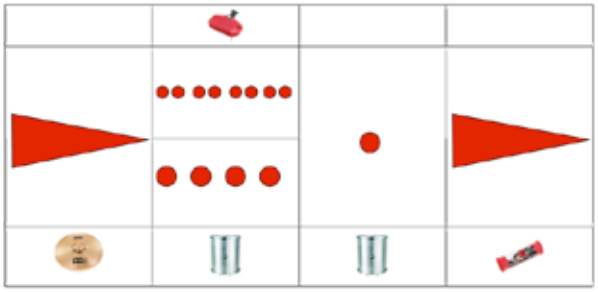
16 The "space" for my own ideas was limited to a few assignments in the music classes.

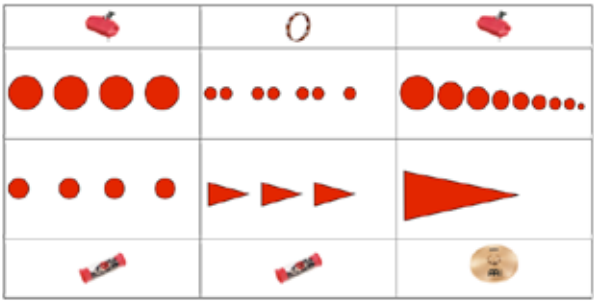
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

COMPOSITIONS BY NOA ROUMIMPER

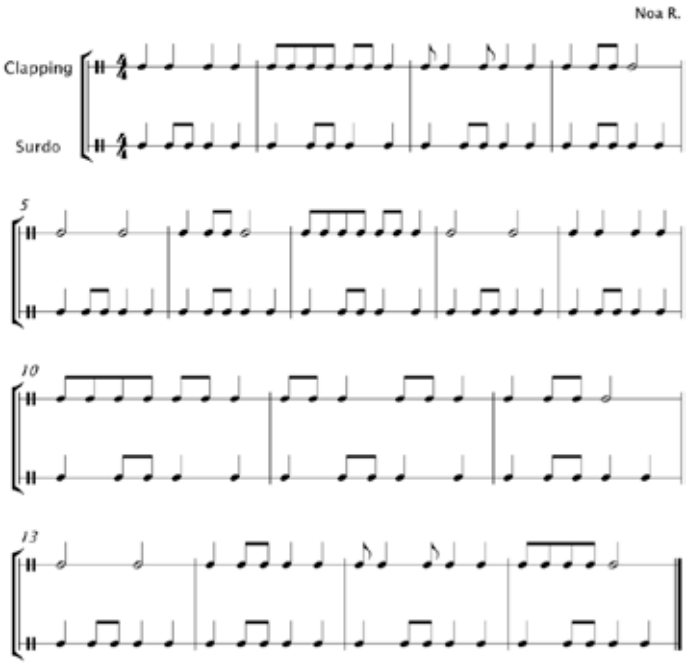
1 Exercise No.1
2 Clapping Music
3 I am Rose
4 Exercise No.2
5 GarageBand 1
6 Pentatonic Vocalise
7 Jarig [Birthday]
8 GarageBand 2, version 3
9 Ostinati
10 Blues

Exercise No. 1
Nea R. 2011





Clapping Music



I AM ROSE

Gertrude Stein

I am Rose my **eyes** are blue

you?

I a...mmm *Rose* and **who**
a
r
e

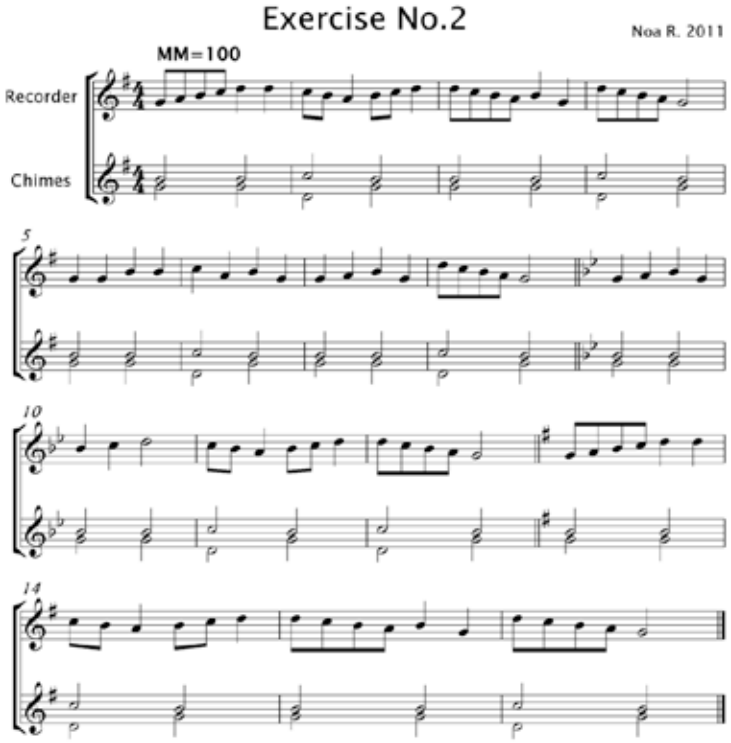
Rose
am and when I *s*
i i n ggggggg
i i
i i
i i
i

I

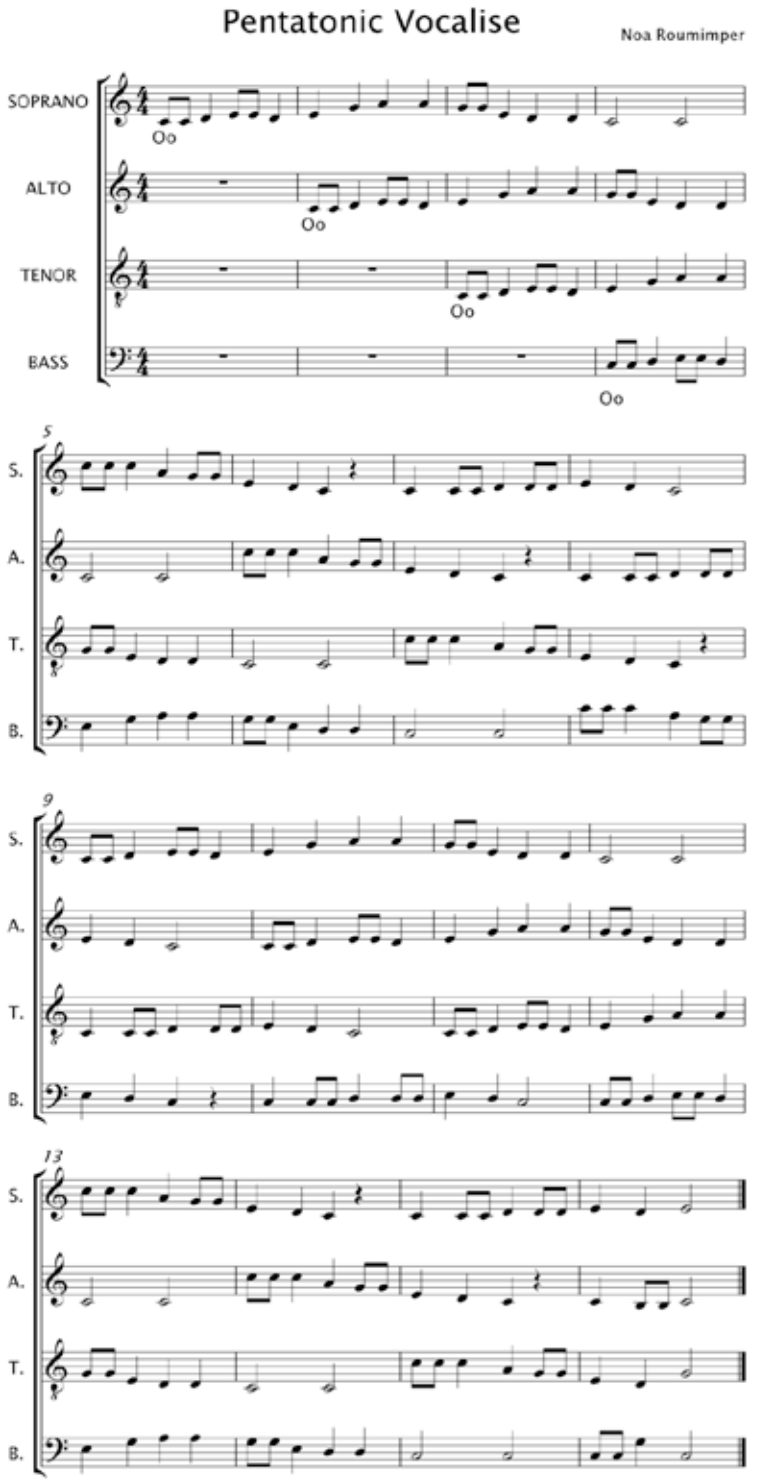
I am Rrrrrrrrrrrose like *anything.*

Notation: Noa Roumimper, 2011

Source: Here's a little poem. A very first book of poetry
Collected by Jane Yolen and Andrew Fusek Peters
Cambridge: Candlewick Press


Exercise No.2
Noa R. 2011
MM=100
Recorder
Chimes
5
10
14

GarageBand 1


Pentatonic Vocalise
Noa Roumimper
SOPRANO
ALTO
TENOR
BASS
Oo
Oo
Oo
Oo
5
S.
A.
T.
B.
9
S.
A.
T.
B.
13
S.
A.
T.
B.

JARIG

Hans en Monique van Hagen
Bron: Lichtjes in je ogen
Amsterdam/ Antwerpen: Querido, ISBN 90 451 0359 1

Muzieknotatie: Noa Roumimper

Ik ben bijna jarig
Dan heb ik een partij
En weet je
Wie er ook mag komen

Jij

Ik wil wel een mooi cadeau
Dat moet je voor me kopen
Het liefst wil ik een paard
Dat op het dak kan lopen

Er mogen veel cadeautjes komen
Met de kinderen erbij
Iedereen krijgt taart
En de pakjes zijn voor mij

Cabasa

Ik ben bijna jarig]
‘Luid en hoog’

Triangel

Dan .....
‘Spannend’

heb ik een partij
‘Blij’

Flexatone

En weet je
‘Gewoon’

Metalofoon

Wie er ook mag komen
‘Blij’ (nadruk op ook)

Bekken

Jij
‘Luid & blij’

Spring drum

Ik wil wel een mooi cadeau
‘Fluisterend’

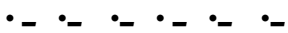
Drum

guiro

Dat....
‘luid

moet je voor me kopen

Agogo



Het liefst wil ik een paard
(nadruk op liefst)

Xylofoon

Dat op het dak kan lopen
'Hoog'

Afro Shaker

Er mogen veel cadeautjes komen
(nadruk op veel)

Beat ring

Drum

Met de kinderen **erbij**
(nadruk op kinderen)

Triangel op taart

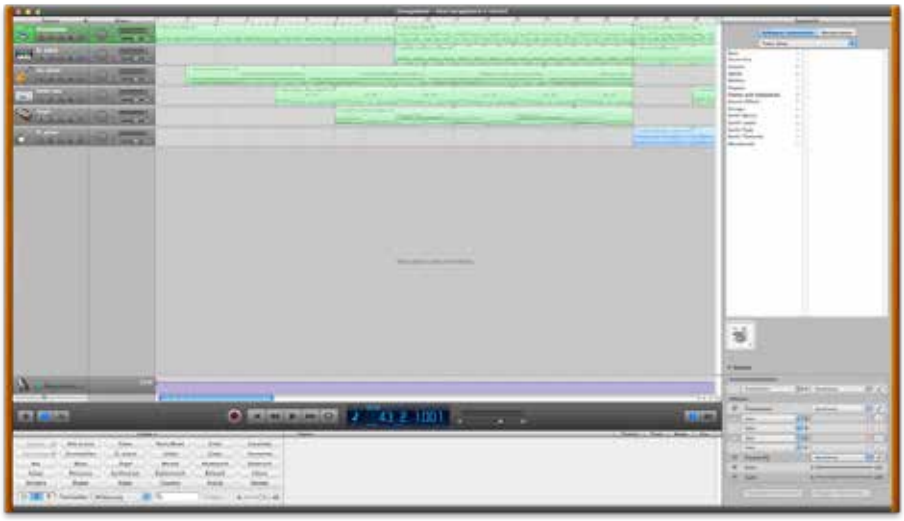
Iedereen krijgt taart
'Hoog en enthousiast'

Shaker

Bekken

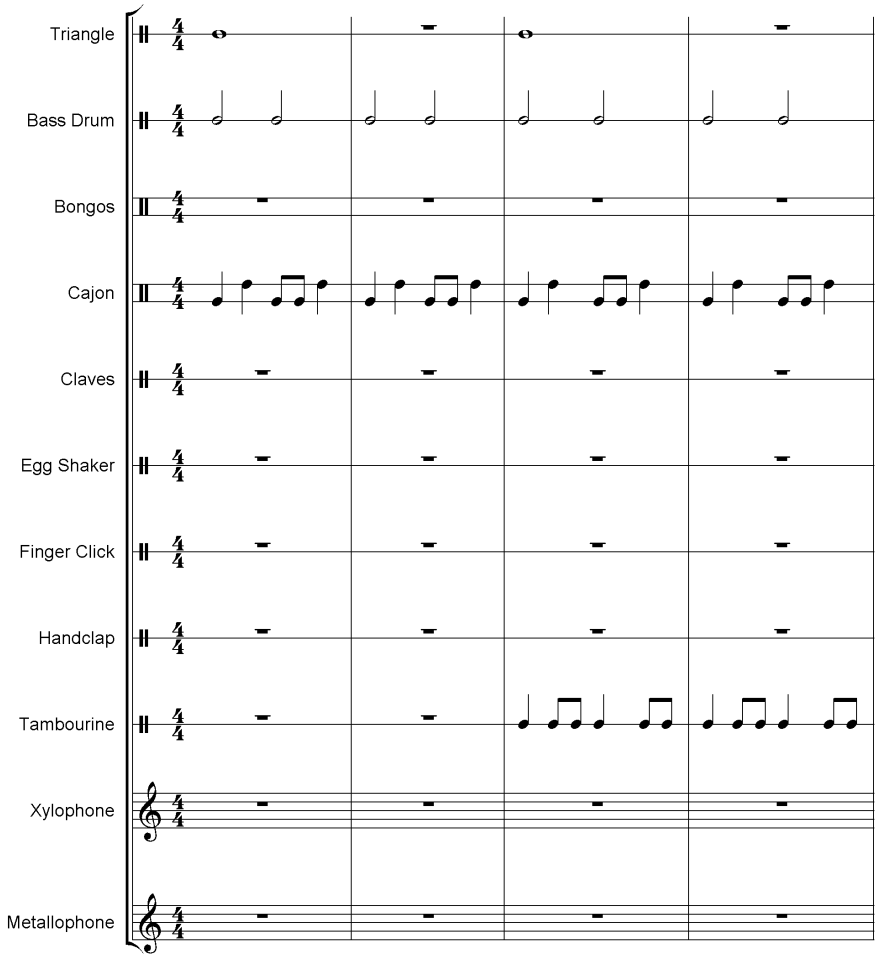
En de pakjes **zijn voor mij**
(nadruk op pakjes) 'Luid'

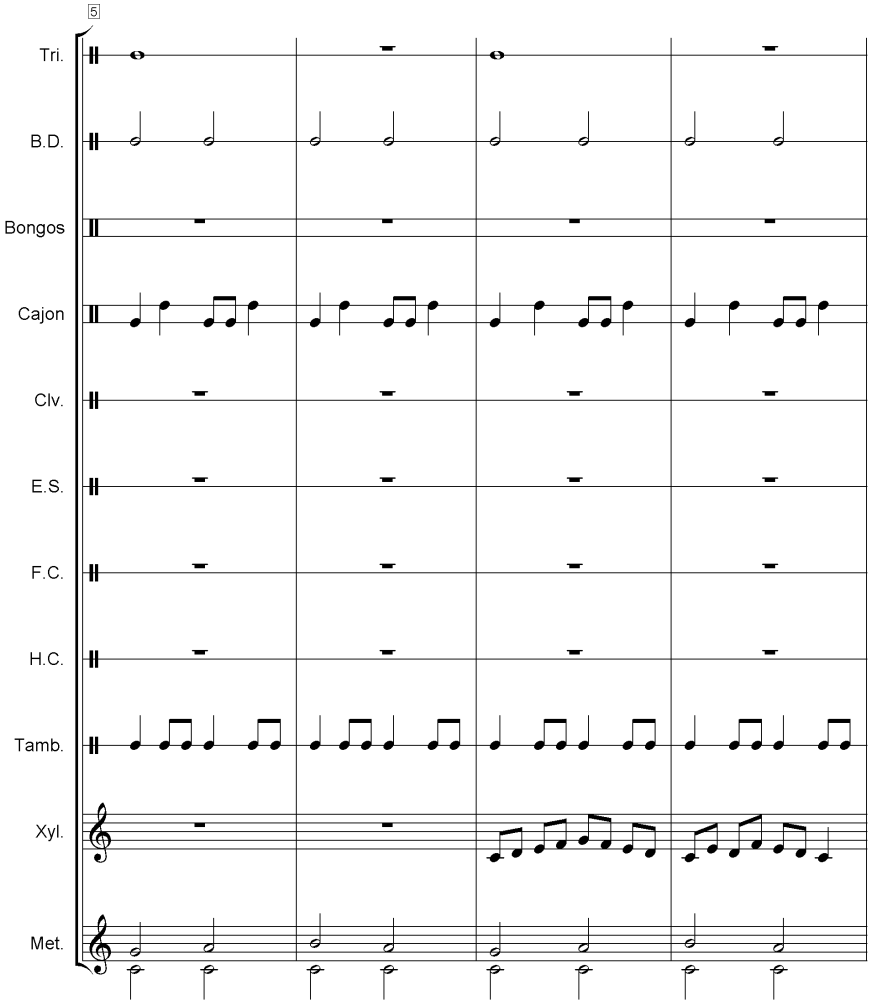
GarageBand 2, versie 3

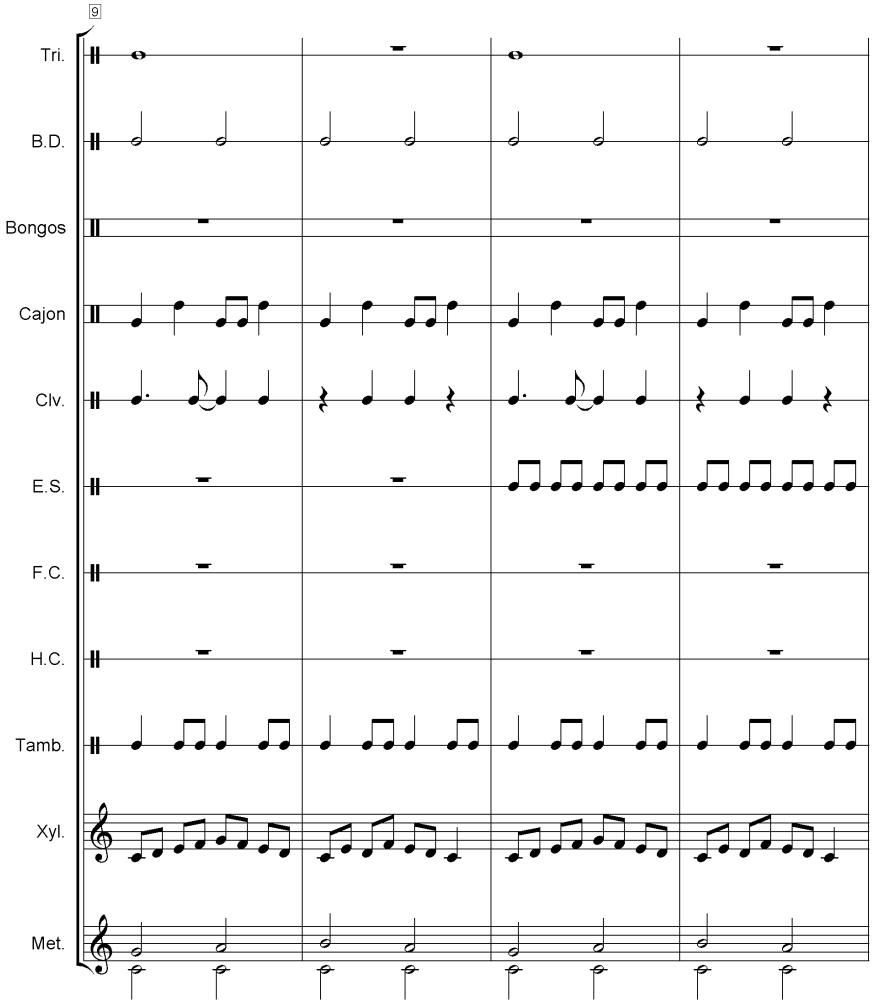


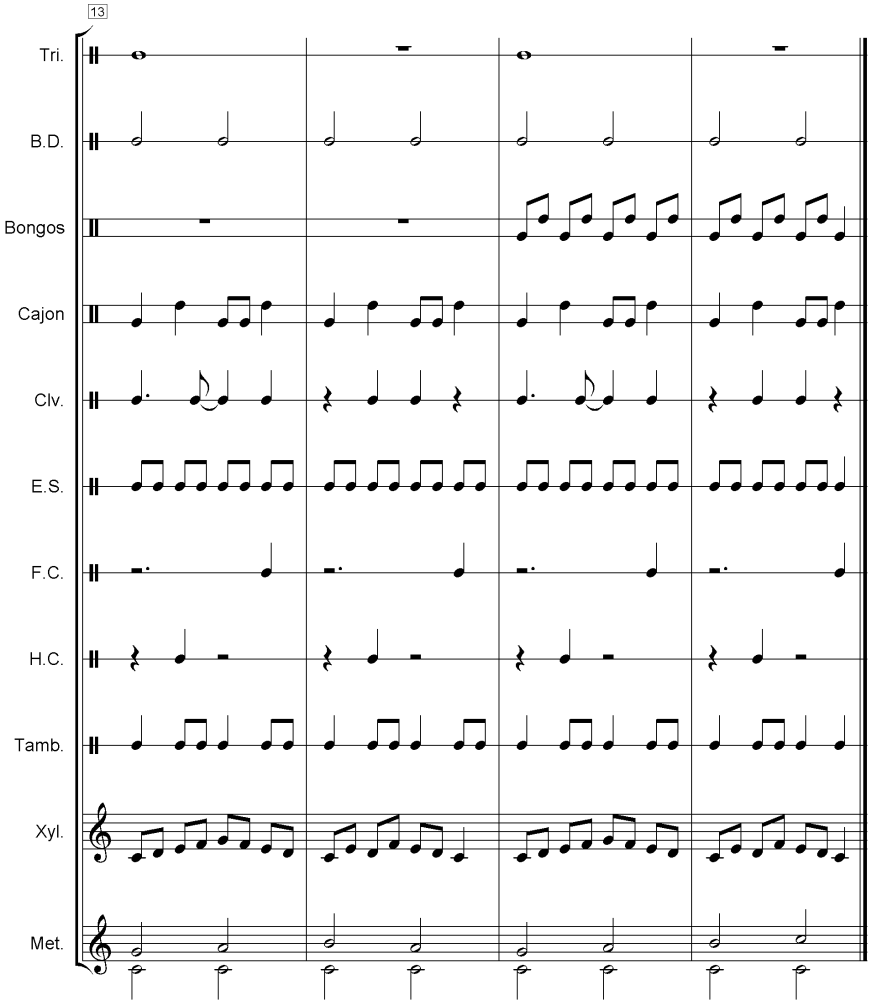
Ostinati

Noa Roumimper



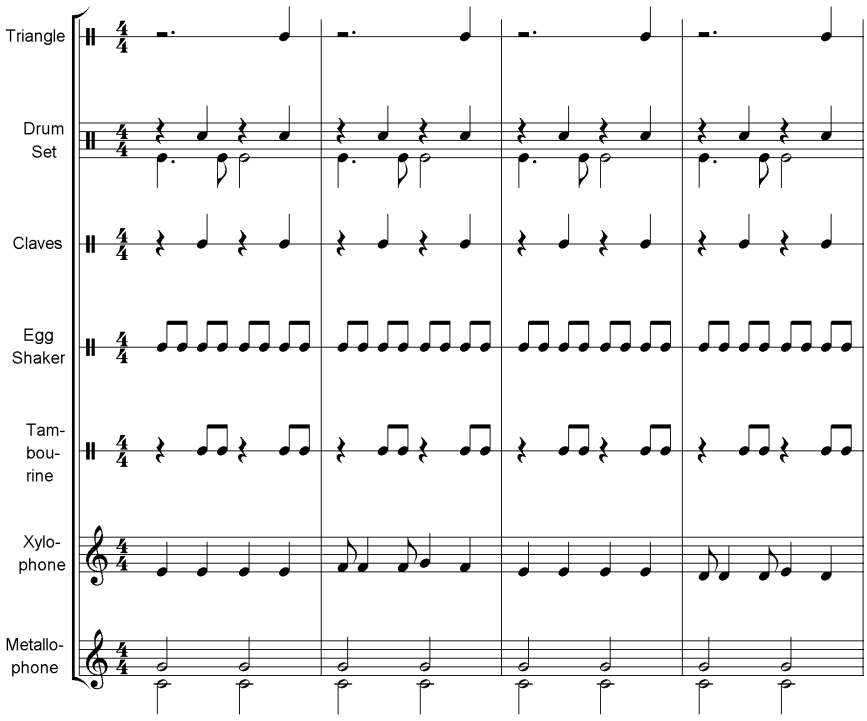

5
Tri.
B.D.
Bongos
Cajon
Clv.
E.S.
F.C.
H.C.
Tamb.
Xyl.
Met.

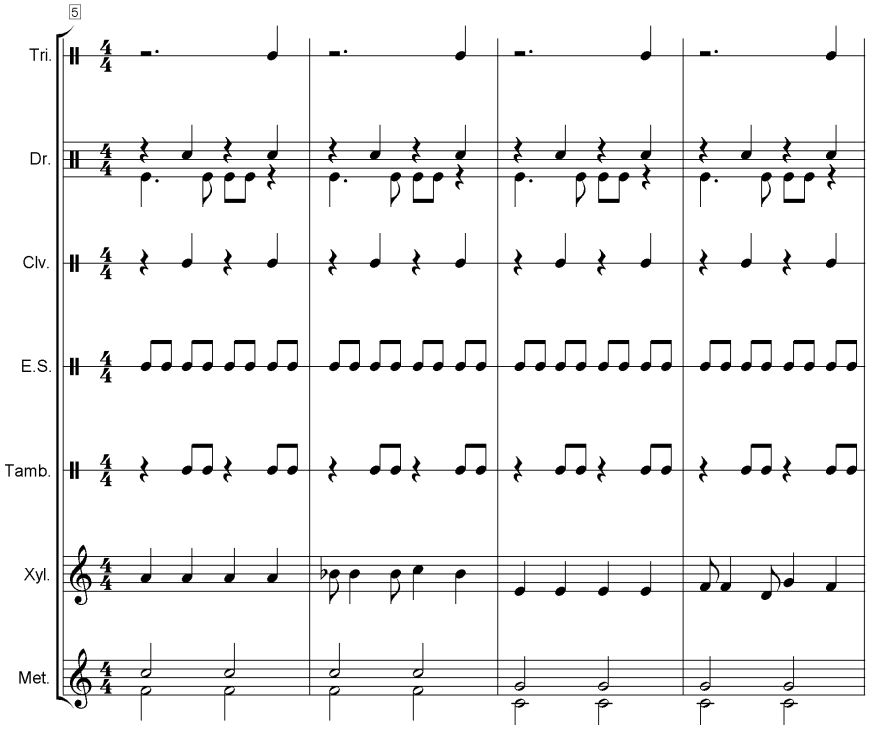

9
Tri.
B.D.
Bongos
Cajon
Clv.
E.S.
F.C.
H.C.
Tamb.
Xyl.
Met.

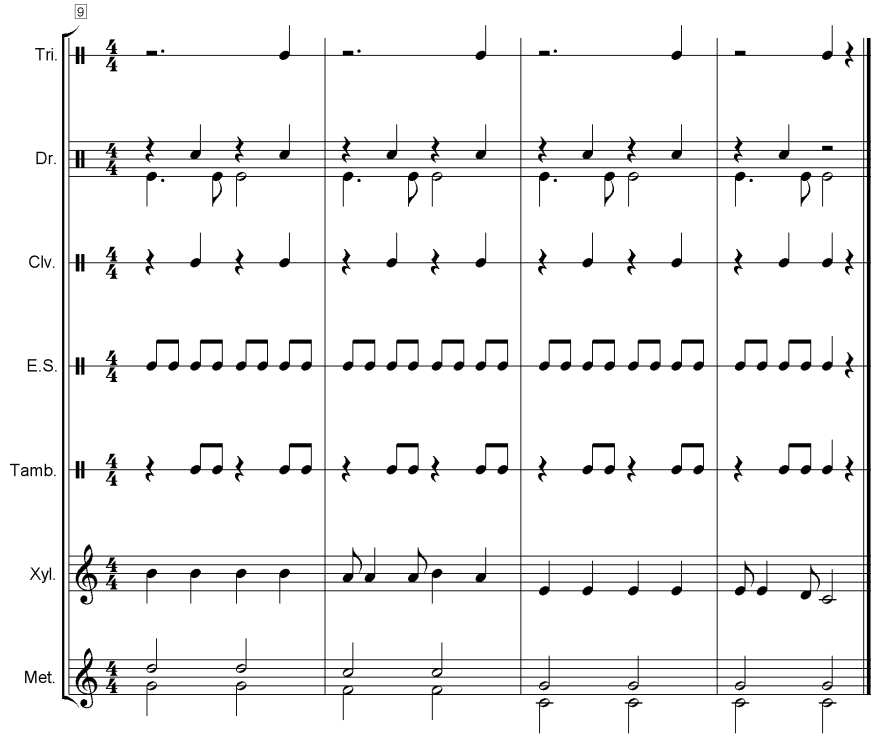

13
Tri.
B.D.
Bongos
Cajon
Clv.
E.S.
F.C.
H.C.
Tamb.
Xyl.
Met.

Blues

Noa Roumimper




5
Tri.
Dr.
Clv.
E.S.
Tamb.
Xyl.
Met.


9
Tri.
Dr.
Clv.
E.S.
Tamb.
Xyl.
Met.

SUMMARY

SUMMARY

The Child as Composer; Music Composition as Social-Cultural Activity in the Elementary Classroom

General introduction

This doctoral dissertation reports on a research project consisting of a number of studies into the impact of music and music education on the functioning and development of elementary school students. The studies reported in this dissertation are the result of a process that started in 2006 with the conference: *'Harmonie in Gedrag. Over de maatschappelijke en pedagogische betekenis van muziek' ['Harmony in Behavior. On the social and pedagogical significance of music'],* held at The Hague University for Applied Sciences and organized by the research group Youth and Development.

One of the outcomes of the 'Harmony in Behavior' conference was that, although in a number of other countries studies have been conducted on the social and pedagogical significance of music in elementary education, research on music education in elementary school is scarce in the Netherlands. Both educators and scientists indicated that scientific research on music education in the Netherlands is necessary to improve current practices in (elementary) schools, preschools and specialized music schools. A second outcome of the conference was the awareness of music reproduction as the dominant activity in music education practices. Opportunities for students to produce music (to compose and/or improvise music) are scarcely practiced in schools, while research suggests that productive approaches can have more impact on music learning and engagement in music education than reproductive ones.

Boosted by the outcomes of the conference, the current research project *'The Child as Composer; Music Composition as Social-Cultural Activity in the Elementary Classroom'* has been started. With this research project, the author wants to contribute to the body of knowledge regarding the impact of music and music education on functioning and development of elementary school students, with an emphasis on the impact of music composition as a classroom activity.

In this doctoral dissertation, five studies are presented in chapters 2 to 6 respectively. The following general research questions are addressed in this doctoral dissertation: *What are the effects of music education on social, emotional, cognitive and motor functioning? How can musical activities for children be conceptualized as playful activities that establish optimal conditions for (musical) learning outcomes?* and *What are the effects of music composition as a classroom activity on engagement in music education and on academic and musical achievement?*

The impact of music on child functioning

For a long time, music educators and educational scientists have suggested that music, either in the form of music education, music practice, or exposure to music, can have a significant impact on school achievement, school attendance rates and students' conduct, both in elementary and secondary education. Understandably, musicians and music educators point to studies like these to underpin the importance of music education. Music education and exposure to music by listening or active music making could make children smarter and have a positive influence on children's social-emotional skills, motor development and even improve their chance for success in society. However strong the rhetorical power of statements and claims in favor of music (education) may be, the question that remains to be answered is: Can statements be substantiated with evidence acquired through scientific research conducted in accordance with quality criteria for such research? In other words: *"What are the empirically demonstrated effects of music education on social, emotional, cognitive and motor functioning of children?"* In the second chapter of this doctoral dissertation, the available scientific evidence for the effects of music exposure and music education programs on functioning of children and youth is reviewed.

Twenty-one studies published in peer-reviewed journals during the period 1995–2011 that met the inclusion criteria were identified. Eighteen of these studies focused on cognitive functioning. All of them, with three exceptions, reported positive or moderate positive effects. All reviewed studies on social-emotional and motor functioning showed positive effects of music education. It was concluded that exposure to music and music education can have a positive influence on child functioning. However, given the diversity in research design among the different studies, the final judgment on how robust these effects are and how they can be explained is still lacking. Any conclusions regarding robust effects of music exposure and education on cognitive, social-emotional and motor development are premature. This does not mean that no such effects exist, but the present state of research has not yet been able to identify such effects in a reliable, valid and sustainable manner. (Quasi-)experimental studies need to be conducted, obeying the standards for scientific research. Only then can undeserved claims be refuted and the surplus value of music education be demonstrated.

In order to contribute to the scarce body of knowledge regarding the problem mentioned above, the following research question has been articulated: *"How can musical activities for children be conceptualized as playful activities that establish optimal conditions for (musical) learning outcomes?"* A broad approach has been chosen to answer this research question, including both theoretical and empirical studies. As for the empirical part, a mixed method approach is used. Both qualitative and quantitative data have been collected in response to the general research question described above. Both qualitative (study 5: 'Noa, a 10-year-old composer') and quantitative data (study 4: 'The effects of music composition as a classroom activity', and study 5: 'Noa, a 10-year-old composer') have been analyzed following pervasive and rigorous procedures for qualitative and quantitative methods. Data have been triangulated to study the child as composer. Studies 2 and 3 (chapters 3 and 4) are theoretical studies on music play and music composition to construct a theoretical framework for the empirical studies 4 and 5 as described in chapters 5 and 6.

Playing music.

A perspective on music education using the Cultural-Historical Activity Theory of learning and development.

Music education in elementary schools is traditionally seen as a way of introducing young children into their cultural community's music by singing songs, and listening to popular and classical music. Over the years, there have been advances that have broadened children's experiences with music by introducing music and movement, and supporting active music listening and the playing of instruments, including reading musical scores. Despite these advances, mainstream music education in the Netherlands has remained a school-based enterprise of a mainly reproductive nature. There is no doubt that this approach will succeed in revealing and encouraging talents, but for the general student population, music education today is not very successful in raising the students' level of musical development beyond the point of maturation and incidental moments of development based on experiential learning in everyday practices.

Many school subjects have been the focus of innovation by making the step from a reproductive approach to a more productive one, in which young children are actively involved in the construction of the objects (subject matters) that are relevant in their respective disciplines. Although similar steps towards productive music engagement have been proposed and taken in music education over the past decade by many music teachers, there are still important steps to be taken to truly innovate in music teaching in elementary education. The aim of the third chapter of this dissertation is to develop an argument for a play-based curriculum in music education.

A quick overview of the history of the concept of play illustrates the wide diversity of ideas about the value of play and the lack of a clear definition of play. Many teachers and academics have nevertheless picked up the notion of play as a basis for the innovation of classroom practices and have implemented it as context for children's meaningful learning.

Looking specifically at music, music is inherently considered a playful activity, as is expressed in many languages. People *play* music, or *play* an instrument. One plays the drums, or can play in an ensemble. Are we just talking about completely different meanings of the verb *'to play'* in these different utterances? Or is there a deeper connection with a psychological activity to which this verb refers, comparable to the referent of utterances regarding playful activities in which (young) children purposelessly enjoy themselves and learn?

This study explored the possibility of conceiving musical activity as play and particularly focused on the question: *"How can musical activities with children be conceptualized as playful activities that establish optimal conditions for (musical) learning outcomes?"* From the perspective of the Cultural-Historical Activity Theory, one could answer this question in the following way: play can be conceived of as a way of carrying out human activities. All human cultural activities can be accomplished in more strict and mechanistic ways or in more free and joyful ways, and the same can be said of musical activities. Musical play is a mode of activity defined by the three parameters of the activity format: rules, degrees of freedom, and involvement.

Traditional forms of music education that focus on training for strictly rule-regulated performance can be seen as essentially reproductive forms of music education. Educational activities, on the other hand, can be considered productive and playful when they succeed in engaging students in musical activities that relate to their interests, building on rules that can be acknowledged by the students, and allowing the students freedom in interpreting the rules and the forms of performance. Like in many other subject matter domains, music education can take the step from a reproductive approach to a more productive one. Although there are many musical activities that allow for playful versions, it is argued here that *music composition* activities in particular follow the play format of activity and offer children opportunities to create their own music.

Music composition can be offered as a playful activity in elementary schools. Children are able and want to participate in such playful activities and actively appropriate musical skills and knowledge while creating their own music composition(s). However, they need assistance to improve their ability to participate in cultural practices such as music composition.

Music composition in the music curriculum

In contrast to other arts subjects, music education focuses foremost on the reproduction of music, rather than the production of their own pieces of art. In chapter 4, different theoretical fields have been brought together in order to develop an approach to music education that concentrates on 'composing' as a core activity, and that is relevant for elementary school teachers. This chapter is a theoretical study, in which the possibilities to regard children as composers are explored. The following three research questions are inquired: 1. *"What is music composition?"* 2. *"To what extent does music composition require the mastery of music notation and creativity?"* and 3. *"What are the pedagogical implications of music composition as a regular classroom activity?"*

It is concluded that the drive for students' creative involvement in cultural practices can be found in the desire of children to be part of and to participate in the world of adults, according to a basic assumption of the Cultural-Historical Activity Theory. This is their incentive for development and learning. Play offers people the opportunity to take part in practices in their own way, due to the essential degrees of freedom in play. This activity format of play offers people of all ages the opportunity to engage in imaginative situations and intense experience. On the basis of these theoretical assumptions, we construed 'composing' as a playful cultural practice following some musical rules, allowing the participants some degrees of freedom and raising high levels of personal involvement. Through playful participation in a composing practice with experts, newcomers can learn and improve the rules and appropriate relevant knowledge and skills. From this point of view, the composing process is conceived as a planned and deliberate realization of a creative process with a new piece of music as the outcome (Campbell & Scott-Kassner, 2006). Pedagogical implications of music composition as a regular playful classroom activity are that the participating and guiding expert (teacher) should never impair the quality of the activity as play, i.e. the expert should abide by the characteristics of the activity format of play – rules, degrees of freedom, and intense experience.

The chapter describes a pedagogical model consistent with this play-based approach as a three-step-model, in which step 1 is the creation of a common base, step 2 is creating ideas and writing the composition, and step 3 is the presentation and publication. The presumed potential of this pedagogical model is that it can enhance meaningful musical learning in elementary school students. The validity of this theoretically construed claim can only be verified by further empirical research in which the model is implemented in everyday elementary classrooms. Such research is described in chapters four and five of this doctoral dissertation.

The effects of music composition as a classroom activity on engagement in music education and academic and music achievement: A quasi-experimental study

The present study aims to contribute to the understanding of the effects of music education, in particular music composition as a classroom activity for fifth-graders and sixth-graders (aged nine and ten). The aim of this study is to gather empirical evidence with regard to the effects of productive music education on engagement in music education and both academic and music achievements. The rationale for studying the connections between music education and other academic achievements is primarily to assess whether music education contributes to development in general. The main research question of this study is: *"What are the effects of music composition as a classroom activity on engagement in music education and on academic and music achievement?"* The authors specifically investigated the effect on academic and music achievement of productive music education on elementary school students compared to a teacher-centered approach, mainly based on reproduction of music with regard to singing, playing instruments, and music and movement. Engagement in music education means that students are able and motivated to participate in music activities.

The intervention (experimental condition) focused on a three-step model for music composition, based on the Cultural-Historical Activity Theory of education, and has been compared with a teacher-centered approach mainly based on students' reproduction of music (control condition). Results indicated that after the six-month intervention period, students in the experimental group were more engaged in music education compared with students in the control group.

The overall results of the present study comparing two types of music education showed the following. First of all, the study demonstrates positive effects on students' engagement in both types of music education, but greater effects in the music production condition, which confirms the hypothesis that music production would lead to more engagement in students than music reproduction. Secondly, this study does not support the hypothesis that music education as such contributes to nonverbal intelligence. Also, no differences in this respect were found between students in the music production condition versus students in the reproduction condition. This deviates from the findings reported by Bastian (2002) in which significant positive effects of music education on intelligence were reported. Thirdly, the findings of this study partly confirmed the hypothesis that the students of the experimental group

would perform better with regard to academic skills than the control group. The students of the experimental group performed better with regard to some academic skills than their counterparts in the control group; at least, such an effect was found for reading comprehension. It remains uncertain what this difference should be attributed to. One possibility is that students in the experimental group made extensive use of symbolic notation and were more focused on the text-like dimensions of their compositions. A transfer to reading comprehension could have taken place. Fourth, although both groups showed progress with regard to singing, no significant difference between both groups was found in this respect, despite the fact that the control group sang much more than the experimental group. This might indicate, since relevant variables here are melody and rhythm performance as well as expression and comprehensibility, that these can apparently also be improved by non-singing music activities.

In conclusion, this study highlights the surplus value on several dimensions of composition as a classroom activity, such as on engagement and on academic abilities like reading comprehension. The study has shown that music composition is feasible and useful in elementary schools. Students are able to compose music in the same way as they are able to sing songs, play instruments and perform dances. It is concluded that productive music education is evidently more engaging for students than reproductive forms of music education. However, productive music education requires teachers to have different pedagogical, didactical, organizational, and reflective skills than one would have for reproductive music education. For example, using forms of cooperative learning and differentiated instruction. This has consequences for teacher education.

The value of these findings are substantiated by the fact that the present study meets scientific standards (Slavin, 2008) with regard to: (1) randomized assignment: classes were randomly assigned to the experimental and control group; (2) sample size: 131 students participated in this study; and (3) duration: the study lasted 10 months.

Nevertheless, there is a number of limitations to this study. First of all, randomization was only at the class level and not at the level of students or school. Secondly, the same teacher carried out both interventions. A possible proclivity towards one or the other approach to music education cannot be excluded as having affected the outcomes. Thirdly, it also cannot be excluded that differences between both conditions had to do with factors other than the presence or absence of composition as an activity. For example, music composition may require forms of interaction between teacher and students that are different from reproductive music activities. For example, in music composition activities, students get more feedback both individually and in small groups than in music reproduction activities where the class is addressed as a whole.

Notwithstanding these possible limitations, the findings with regard to engagement and certain academic skills, such as reading comprehension skills as a result of music education through composition, are intriguing enough to warrant further research and reconsideration of the content of music education in other elementary school settings and with other teachers.

Noa, a 10-year-old composer: A single-subject case study

The present case study aims to contribute to the knowledge of music composition as a meaningful activity in music education. An extensive amount of literature on music composition is available; however, music composition as a regular classroom activity is rarely seen in elementary schools. The effects of closely guided music composition, in which extra attention is paid to the revision of music compositions, on engagement in music education and music achievement in a single-subject situation were studied using a three-step model for music composition based on the Cultural-Historical Activity Theory.

In conclusion, this chapter shows that music composition, even when it is an increasingly complex activity, is an activity accessible to children in the elementary school age. Music composition organized according to the activity format of play offers children the chance to actively produce music, instead of reproducing music, in activities characterized by determinants that form the play format: rules, degrees of freedom, and engagement.

Despite the increasingly demanding activities, Noa showed to be highly engaged in music education, specifically in music composition activities formatted as play. In this guided process she also showed an increase in music skills and knowledge. This made Noa feel proud of her own work. She was highly motivated and articulated the wish to come again the following week to make a new music composition. For her teacher, it was challenging and rewarding to offer Noa assistance to make the best possible progression. Comparing the outcomes of this single-subject case study with the outcomes of the comparative classroom study (Hogenes, Van Oers, Diekstra & Sklad, 2015) in which music composition in classroom situations was studied, remarkable differences could be found. The same three-step model was used in both studies. Although the music compositions in the classroom study were musically interesting, Noa's compositions were much more complex and, as judged by her teacher, richer concerning musical ideas, structure and notation. It was more difficult to revise music compositions with a class as a whole, while in a one-on-one situation the teacher is easily able to give impulses to the process that lead to significant improvement of the music compositions. In a classroom situation it would be very difficult to make a composition like Noa's 'Vocalise'. Not only was the lesson plan highly influenced by Noa in her role of composer, but she also required a lot of feedback to help with the composition of the last few bars of the 'Pentatonic Vocalise'. It would be impossible to give the same amount of time and attention to individuals or small groups of children in a classroom situation.

Music composition in schools can be seen as an activity that takes place as a collaborative and reciprocal activity. Noa learned from her teacher, but also brought experiences and contemporary knowledge to the music composition sessions. The teacher was the more knowledgeable partner in the teaching/learning process. He, however, also learned from Noa, for example how to scaffold the revision process, and adjusted his lesson plans based on the creativity she showed during the sessions.

Based on these observations, it is concluded that music composition can be expanded into elementary school age under appropriate guidance. The single-subject study demonstrated that complex composition activities in which the student is allowed to follow personal interests

and receives action-focused guidance, leads to intense engagement in music education and high music achievements (in terms of musical products and skills). In this process, 10-year-old Noa has shown herself to be a real composer.

It can also be concluded from this case study that conducting music composition activities as a regular classroom activity may be claimed to be feasible. Music composition is an activity accessible to elementary school children. The used music composition model, implemented in a play format, offers regular classroom teachers the many possibilities to guide music composition in elementary schools. However, to offer all children the assistance they need, working in small groups is suggested.

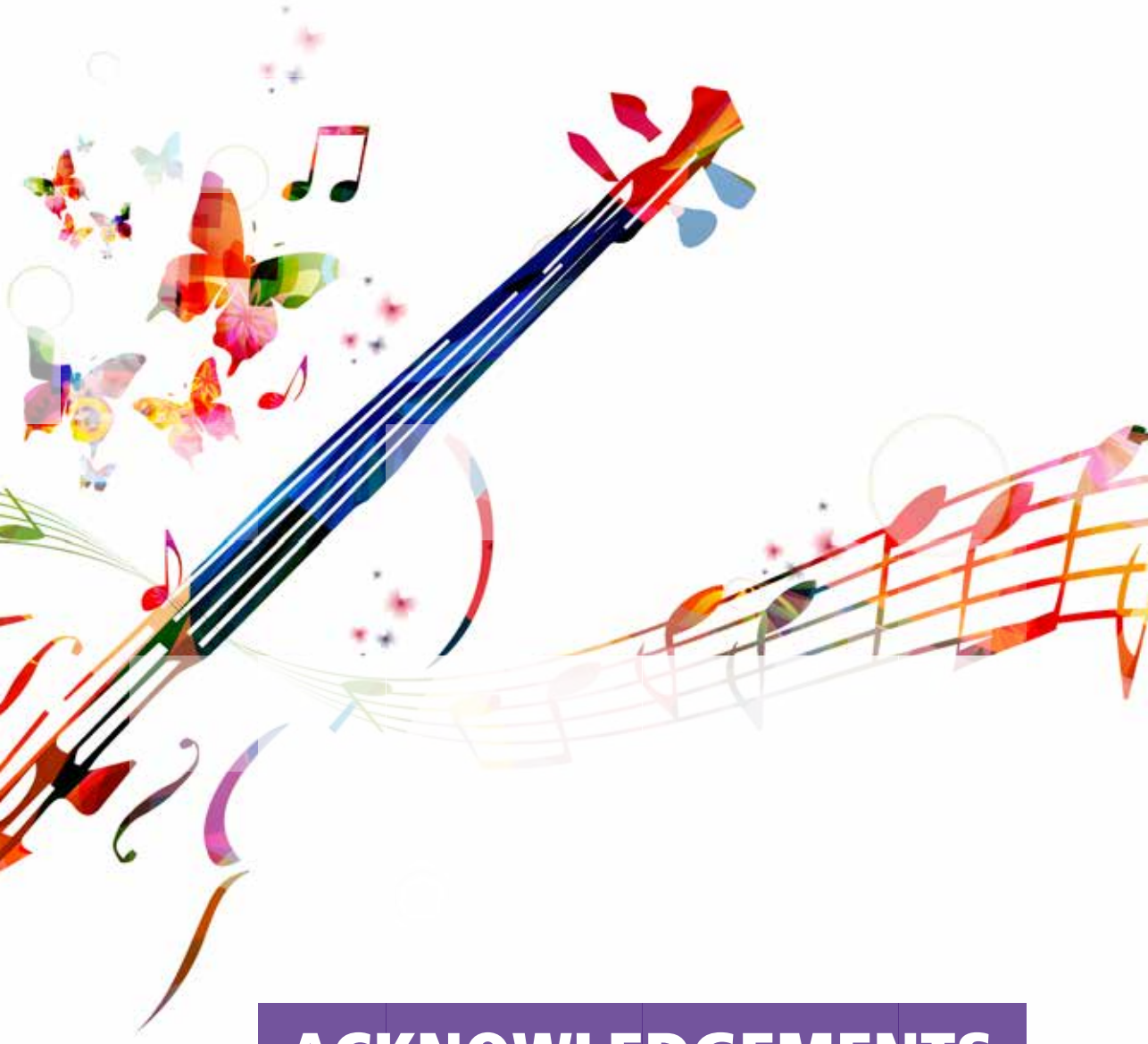
The Child as Composer

The results of this doctoral dissertation have some important implications for music education in elementary schools and (music) teacher education. Music as a school subject has been marginalized over the last few decades. However, the current 'Impuls Muziekonderwijs' [Impuls Music Education], a (financial) impulse of the Ministry of Education to achieve a sustainable embedding of high-quality music education in primary education by promoting professional development of teachers, structurally teaching music during school hours and the formation of connections between in-school and extra-curricular music education, offers new opportunities to bring music and music education back to all elementary schools in the Netherlands.

This dissertation shows that music education organized according to an activity format of play leads to increasing levels of engagement in music activities in elementary schools. It offers a pedagogical model consistent with this play-based approach as a three-step-model, in which step 1 is the creation of a common base, step 2 is creating ideas and writing the composition, and step 3 is the presentation and publication.

Using the developed model for music composition, every classroom teacher should be able to work with students on music composition. It offers classroom teachers tools to motivate, stimulate, and facilitate students in working on challenging assignments, which offer students insight into musical concepts and help develop musical skills. The presumed potential of this pedagogical model is that it can enhance meaningful musical learning in elementary school students.

In order to facilitate (new) teachers with competencies to teach music in a productive way, i.e. to be able to teach music composition and improvisation, these activities should be part of the core curriculum of (music) teacher education. Teacher education departments [pabo's] and music in education departments [Docent Muziek] of conservatoires play a major role in the reformation of music education. If researchers and educators will collaborate on the improvement of music education, music may establish a firm, sustainable basis in elementary school curricula. ■



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"We shall not cease from exploration. And the end of all will be to arrive where we started and know the place for the first time"
T.S. Eliot, (Little Gidding V, Four Quartets, 1942)

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CURRICULUM VITAE

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Michel Hogenes was born on 8 November 1970 in Purmerend, the Netherlands. He studied Electronic Organ and Music in Education at the Alkmaar Conservatory, and obtained post-HBO [university of applied sciences] certificates in Ortho(ped)agogische Muziekbeoefening, a form of Music Therapy, as well as Keyboards, and Early Childhood Music Education.

After his studies, Michel worked as a music educator in special education, elementary education, and secondary education. He also taught keyboards, electronic organ and music introduction courses at a music centre and was active as the conductor of several choirs and orchestras.

Currently Michel is a lecturer at the teacher education department, and researcher in the research group Youth and Development of De Haagse Hogeschool [The Hague University of Applied Sciences]. He also lectures at the Music Education Department of Codarts, Rotterdam University of the Arts, and is the conductor of Projektkoor Rijswijk [Project Choir Rijswijk].

Besides his work at both universities of applied sciences and his choral conducting, Michel is active in several organisations. He is chair of Gehrels Muziekeducatie [Gehrels Music Education], the Academie voor Ontwikkelingsgericht Onderwijs [Academy for Developmental Education], and the European Network for Music Educators and Researchers of Young Children (EuNet MERYC). He is TIG leader of the Arts Education TIG (Thematic Interest Group) which is part of the European Teacher Education Network (ETEN); board member of Stichting Toeval Gezocht [Looking for Coincidences Foundation]; member of the Board of Trustees of Music Educators and Researchers of Young Children, United Kingdom (MERYC UK); editor of Applied Research Today (ART), a journal of The Hague University of Applied Sciences; and ambassador of Meer Muziek in de Klas [More Music in the Classroom]. ■