

## THE CREATIVITY OF GIFTED CHILDREN IN ESTONIA AND FINLAND FROM A MUSICAL AND ENVIRONMENTAL PERSPECTIVE

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**Abstract.** This study is one part of the co-operative research project of gifted (IQ 120–144) 6–8-year-old children in Estonia and Finland. In this article we report and compare the creativity, musical ability and environmental aspects of these gifted children. The creative thinking and the musical ability of these Estonian and Finnish gifted children is explored from a learning environmental perspective. The information was collected using both qualitative and quantitative methods by interviews of 64 gifted children. Children's creativity is described through teacher evaluations and a creativity and musicality assessment test. The environmental aspects are assessed by questionnaires sent to parents and by interviews of 64 gifted children. This study explores what young gifted children tell about their own musical environment and how their creativity and musical abilities can be evaluated. We have tried to ascertain how the learning environment of gifted children can best be supported to foster their creativity and satisfaction in musical expression and culture. There are significant connections between the different levels of creative thinking, giftedness and musicality. Homes and teachers play an important role in creative thinking and music. According to teachers' assessments competence of creative arts seems to be significantly linked to competence in other areas of school life.

**Keywords:** creativity, learning dispositions of gifted children, music education

### 1. Introduction

The research focusing on human intelligence and creativity has recently become increasingly significant in the development of the world, and the study of giftedness is in particular acquiring greater importance. Thus researchers into giftedness worldwide have mainly focused on giftedness in early childhood, because each society is interested in having more gifted personalities among its members.

People have individual differences and we prize and value those differences. Instilling a faith in human individuality, and a sense of innate dignity and uniqueness is seen as an important value of education. By valuing the creative and examin-

ing the unusual, we have an opportunity to gain greater knowledge about the world, events and ourselves. We can ask what kind of education and environment helps gifted or more able children to grow in their creativity and inner motivation.

Our study assesses and describes the creativity of gifted children in Estonia and Finland from a musical and environmental perspective.

This research which studies children and the way their creativity is expressed through music, is a part of a co-operative project between the Tallinn Pedagogical University led by Prof. Maie Vikat, and University of Helsinki, Department of Teacher Education led by Inkeri Ruokonen. The project is entitled *Gifted Children and the Factors Contributing to Their Development in Estonia and in Finland*. Information was collected on gifted (IQ 120–144) 6–8-year old children. The study relies on general giftedness, but a special examination and analysis of the emergence of creativity and musical giftedness, and the part played by development and educational environment, is also carried out. Children's creativity is described through teacher evaluations and a creativity and musicality assessment test.

Creativity is an important construct in children's development and can predict adaptive behaviours for adults in professional, social and personal domains (Maslow, Abraham Harold 1968; Rogers Carl R. 1961, Simonton, Dean, Keith 2000). John Curtis Gowan (1977) also acknowledges the work of Lewis Madison Terman, Maria Montessori and Leta S. Hollingworth with gifted children and the classroom procedures required to stimulate young children.

J. C. Gowan (1977) and Howard Gardner (1983) suggest that the basic concept of intelligence needs to acknowledge that many factors form intellect and that a gifted child is a creative individual. The concept of intelligence should focus on giftedness represented only potentially with the major variable being creativity. The notion of 'giftedness' should therefore be redefined to include the potential of becoming verbally creative whereas 'talent' would mean the potential of becoming creative in other areas, such as in mathematics or in the performing arts.

## 2. Theoretical background

According to Kari Uusikylä (1999:56) creativity consists of four basic elements. These are a person, a process, a product and an environment. Julian Sefton-Green (2000, 3) sees creativity as an integral part of children's personal development and it facilitates both cognitive skills and emotional growth, thinking, doing and feeling. She speaks about the cultural dimension of creative activities. Arts perform three kinds of function, firstly they develop liberal understanding and empathetic insight into people and society. Secondly, they encourage self-expression and imagination, and can include the study of child and youth culture. Thirdly, creative work involves cultural transmission, for example in the curriculum. Creative work relates to developing an understanding of a society's artistic heritage (Sefton-Green, J. 2000:2–5).

Keith Swanwick (1991,50–51) places the ultimate value in education on the arts because the arts are playful, filled with imagination and because each act of

creativity in any sphere has about it a charming air. Joan Freeman (2000) suggests that future research in talent development should focus more on contexts including wider social implications of creativity and the arts in general.

Researchers into creativity share the opinion that creative activity is characterised by inventiveness, difference from the generally accepted, and originality. Robert J. Sternberg (2000) considers that creative thinking helps an individual to give meaning to him or herself, and help to discern problems and solve them. Creative thinking is one of the main domains in Francoys Gagné's (1993) model of giftedness, while according to Joy Paul Guilford (1979), the aim of creative thinking is to create new things, to apply original approaches on the basis of existing knowledge and skills. E. P. Torrance (1974), for his part defines creative thinking as the process of perceiving the problem and finding a solution to it.

Francoys Gagné (1999) argues that individual differences in demonstrated talent are explained by many causal factors, among them natural abilities, as defined and described in his differentiated model of giftedness and talent. His model attempts to bring together in an interrelated way all the major determinants of the emergence of talent in any field of human activity. Thus, natural abilities or aptitudes act as the raw material or the constituent elements of talent; one cannot become talented without being gifted. The process of talent development manifests itself when the child engages in systematic learning, training and practising and the level of talent rises the more intensive these activities are. This process can be facilitated or hindered by the action of two types of catalysts: intrapersonal and environmental. Motivation plays an important role in initiating the process of talent development as an intrapersonal catalyst. Genetic predispositions like temperament, as well as styles of behaviour (personality characteristics and attitudes), also contribute significantly to support and stimulate, or slow down and even block talent development. The environment is also a significant catalyst in many ways (Gagné, F. 1999:39–40).

Francoys Gagné (1999) comments on the role of environmental catalysts such as parents and music teachers, and discusses the role of lessons and practice time. His conviction is that a scientific approach to the analysis of talent development in music cannot ignore individual environmental differences in musical aptitude as a significant explanatory factor in musical talent.

Enge Vanarum (2002) studied the creativity of 6-year-old gifted Estonian children and found that more creative children come from families where they are encouraged, supported and where parents spend much time with them. A variety of hobbies favours the development of creativity and helps children to find and solve problems as well as accept interesting challenges. Amongst relatively successful child musicians, the relationship between performance and the sheer amount of time spent practising may be weak or non-existent (Howe, M. J. A. Sloboda, J. A, 1991a).

Many music educators, like Shinizi Suzuki (1973), consider that music involves understanding human experience and transmitting cultural values as well as nurturing the creativity and imagination needed for innovative and artistic thinking. Suzuki's method focuses on early childhood music education. The role of parents as motivators and mentors is highly valued. Stephen F. Zdzinski (1996) has done

research into parents' role as motivators, and found that parents' positive attitude, interest and support for their child's practice activities and hobby correlates to the child's cognitive skills and performance in music, especially at the primary school age. Janet E. Davidson, Dorothy N. Moore, John A. Sloboda and Michael J. A. Howe (1998) interviewed young instrumentalists to assess their progress and their experiences with their music teachers. The most talented group of young musicians characterised their first teachers as better persons and players than the other groups. In reality no significant differences were evident between teachers. According to Kari Kurkela (1993:317), a student's experience of his/her teacher mirrors how a child experiences his/her parents. A good parent-child interaction correlates to a positive experience of the teacher. Susan A. O'Neill (1997) studied the practice habits of 6–10-year-old instrumentalists and compared them to the learned skills and performance in playing. The results showed that the most talented group of musicians had practised three times as much as the group containing the weakest instrumentalists. This result differs from other research where the most talented instrumentalists practised no more than the others (Sloboda, J. A., Howe, M. J. A. 1991b).

Aelwyn Pugh's (1998) study of young gifted musicians tested different reactions to the same environment. One finding was that parents may place greater emphasis on their daughters than their sons. Home is the most important early source of mental and physical experiences that influence the development of cognition and perception. Phyllis Brown Ohanian (1977, 66–72) who studied musically and artistically talented families, found that those parents who supported but did not push their children provided the best climate for achievement and creativity.

Researchers agree on the need to assess children's musical development. Aelwyn and Lesley Pugh (1998:27) point out the necessity to try and form a clear picture of the forces at play in the musical experiences of children. It is essential to build on children's experiences and develop them further by avoiding needless and unproductive repetition of experiences. It is important to create an accurate view of the extent and rate of progress made by pupils and present them with appropriate challenges to develop further.

According to John A. Sloboda (1990:171) the musical skills of children under the age of seven are often measured using culture-bound imitation tests, which may overlook the musical background of children from minority cultures. Keith Swanwick (1991) suggests that there could be a list of criteria e.g. for composition, maintaining a style, exploitation of the medium, impact and overall impression including melody, notation, tempo and texture, or one could examine improvisation as one criteria of musical creativity. In our study children were too young for this kind of assessment; we could probably have evaluated their spontaneous songs, but we would not have acquired relevant or valid information. For these reasons we did not evaluate children's creativity in music, instead we just collected data about children's *potential* abilities in music.

Kai Karma (1984) has developed a universal musicality test that works for school-aged children (over seven-year-olds) regardless of culture. Karma does not

include the ability to discern individual elements of sound in the notion of musicality but instead emphasises the ability to understand sound structures and relationships between sounds. To eliminate the margin of error resulting from group tests carried out on pre-school children, individual musicality tests based on imitation have proved to be the most practical method of assessing the stage of development of the child’s musical perception skills. There is, however, the risk that musicality tests and assessments of musical expression could lead to product-oriented or performance-centred goals in music education. Estelle R. Jorgensen (1997:90) calls for versatile evaluation methods that do not jeopardise the important and motivating enjoyment and pleasure that children get from expressing themselves through music.

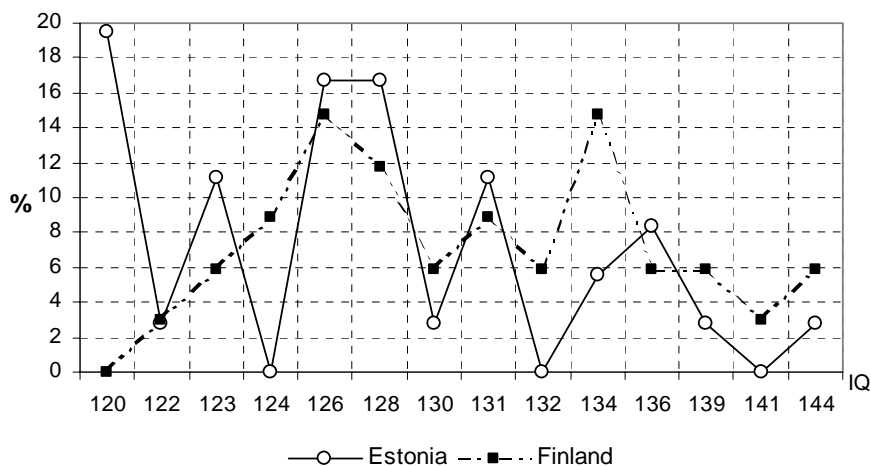
### 3. The empirical study

Our study concerns gifted children, their creativity determined by their musical ability and descriptions of the musical environment.

#### 3.1. The sample

Data were collected from 64 gifted (IQ 120–144) children between 6 and 8 years of age. 32 of the children were from Estonian pre-schools and kindergartens and 32 from Finnish schools or pre-schools. The IQ of the children was measured by Raven’s Colour Matrice Test (Raven, J. C. & Court, J. H. & Raven, J. 1983). This is a nonverbal test and thus suitable for the young children and for cross-cultural research (Figure1).

Figure 1. Raven's intelligence scores of the gifted children of Estonia and Finland



### 3.2. *Methods, techniques and sources*

Both qualitative and quantitative methodologies were used to obtain data. The study was based on general giftedness and IQ measured by Raven Colour Progressive Matrices. Children's creativity was described through teacher evaluations and a creativity and musicality assessment test.

The Torrance Test of Creative Thinking was used to define another intellectual quality that has acquired importance in recent decades, an essential component of giftedness – creativity. Tuula Lotti's musical test (1988) was used to define musical giftedness. The descriptions of children concerning their experiences of music and musical activities were collected in interviews. The results of the questionnaires given to parents assess environmental aspects.

#### 3.2.1. *Test of creativity*

For **the assessment of creativity** we used the **TTCT test adapted for Estonia by Eda Heinla**. A growing interest in creativity has resulted in a search for valid assessment tools and for specialised tests to measure the creative potential of children. Most of these tools draw on the notion that children's creativity can best be expressed during engagement in an open-ended task that allows numerous possible answers. In this respect the tests differ sharply from many ability tests which, in most cases, focus on a single correct solution.

E. Paul Torrance developed the Minnesota tests of creative thinking, **TTCT** (Torrance, E. P 1962:214). The Torrance test has been used extensively by both researchers and educators in the past few decades, probably because it is easy to use and can be collectively administered in a paper-and-pencil format, and can provide some normative data. Different versions of the test are used in different countries. In this study the creativeness of 6-year-old children was measured by the Torrance (1974) Test of Creative Thinking, which has been adapted for Estonia and standardised by one of the foremost Estonian researchers into creativity, Eda Heinla. Relying on this definition of creative thinking, that it is the process of perceiving a problem and finding a solution to it, she measures through Torrance's test four components of creative thinking. The same tests and evaluation forms were also used in Finland, although one and half years later, so children were already 8 years old.

We chose to use nonverbal tasks because they are useful and comparable in cross-cultural studies. The test is on an ordinary sheet of paper divided into six squares, each containing a different stimulus figure. In Finland only a four figure model was used because Estonian children were tested before the Finnish children and they had chosen these particular four figures (MV2). The other Torrance test we used was the Picture-Construction Task. This is also a nonverbal test where subjects are required to think of a picture in which the given shape is an integral part. The material used for this task is a blank sheet of paper in the shape of a jelly bean (MV-1). The line test (MV 3) is also a nonverbal test of ideational fluency and flexibility. The test gives information about originality and elaboration.

Children are given a sheet of paper with six pairs of lines. The instruction is quite minimal: In ten minutes see how many objects you can sketch which have these two lines as the main element in their design. Two lines should be the main part of whatever you make. Estonian testers (Heinla, E, 1993:12; Vennik, M. 2001:37–38) chose the following four aspects for evaluation in all test parts MV -1, MV-2 and MV-3. The first, originality of thinking, was characterised by having clever ideas, presenting well-known ideas in a new way, finding uncommon solutions and producing new and original versions of the structure of the product and ideas. Secondly, fluency of ideas is demonstrated by a speed of thinking, smoothness of information retrieval from memory, the variety of thoughts and images, and the ability to recall ideas which correspond to task-related connections. Fluency or productivity of ideas refers to speed and the number of different ideas derived from the same picture. Thirdly, flexibility of thinking involved the tendency to produce in flexible ways different artistic ideas in the same picture or an ability to generate a vast number of different ideas. Finally, elaboration of thinking is shown by complementing ideas with interesting details, and in results where more complex thinking and boldness are shown by the tendency to seek several detailed and complicated solutions to create the product.

The results of the creativity test are relevant to the discussion: creativity should be viewed as a various construct that requires several cognitive, conative-affective, and environmental resources that should be dynamically sequenced to evoke creative behaviours. It is unlikely that a single test could be designed to capture the full range of creative potential; we need more multiple assessment tools, each focused on such aspects as the creative person, product or process. We need assessments for performances of creative behaviour, measures for cognitive abilities such as evaluative thinking, and personality measures combined with teacher and parent evaluations of children's creativity.

### *3.2.2. Assessing the potential ability in music*

Our way of **assessing musical ability and creativity in music** was complicated, and we introduced holistic methods of evaluation. As we did not employ any test for assessment of creativity in music – and developing musical criteria for creativity assessment is a very sensitive and challenging task – we decided instead to collect data about children's *potential* abilities in music. In order to investigate children's musical giftedness, we used **an imitation test** developed by the Finnish researcher, Tuula Lotti (1988) and assessment of **the child's own song performance**.

The test consisted of tasks of various levels of difficulty. These allowed us to define different components of children's musical giftedness (sense of rhythm and mode, auditory imagination, musical ear and expressive singing), which form a basis for defining musical giftedness. In addition, the child's parents and teachers assessed the child's giftedness. All children who participated in the research were interviewed to determine their thoughts about studying music or having music as a hobby. Many of the children took an active part in music playschool or music school.

According to Tuula Lotti (1998:43), reproductive musicality tests based on imitation model the way in which children learn their mother tongue and measure the child's ability to learn music by listening. Teachers in initial education may also profit from determining the musical facility of children using a diagnostic evaluation at the outset of teaching. Diagnostic evaluation refers to the observation of individuals carried out during teaching. Antti Juvonen (2002:77) questions the value of musicality tests for predicting school success in music. In his view, study success is linked to many factors, such as learning difficulties, musical background and individual interests and hobbies. The results of musicality tests may influence the teacher's attitude towards the child. Especially if the results are made public, they may have a positive – and often, unfortunately, negative – effect on both the child's self-image concerning music and the parents' attitudes towards their child's musical activities.

### *3.2.3. Environmental sources of creativity and musical ability*

In this study we also used information collected from the children themselves and from their parents and teachers. In **the questionnaire given to teachers** they were asked to assess and evaluate the child on creativity, artistic activity and imaginativeness in science subjects. Creativity in problem-solving, the ability to discover short-cuts, curiosity, inquisitiveness, discriminative faculties and diversity of interests, for example interest in books, music, arts and crafts were assessed. The results we also refer to the data from **the parents' questionnaires** giving assessments of their children and descriptions of time spent together with their gifted children and about the role of the media in the families. The **interviews with children** show how with individual differences interests and development take divergent paths. The interview dealt with the child's perceptions, descriptions and affective memories of meaningful learning situations, and assessed the cultural and environmental factors of the child's everyday life. When analysing the theme interviews we used the systematic analysis technique to determine the child's experiences about music, musical activities and musicians, expectation of success and the subjective task values in his/her special interest.

## **4. Results**

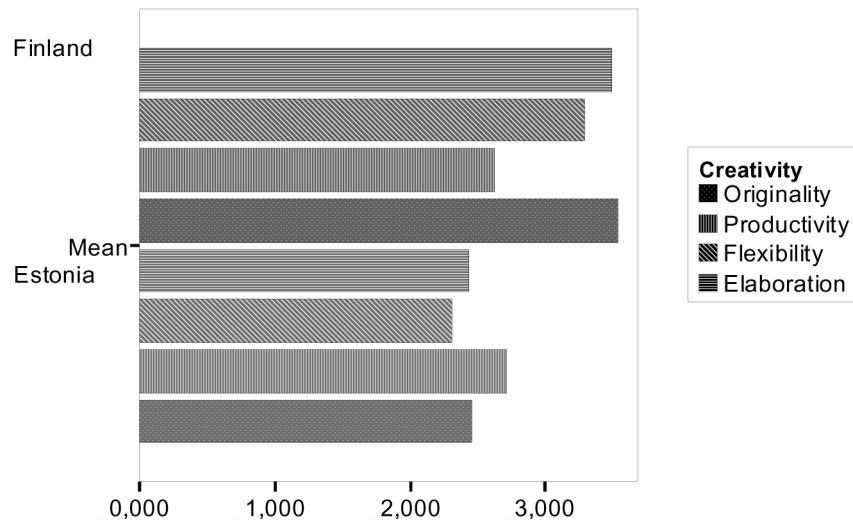
Our study sees the development of a child as a social process where intelligence and creativity can grow continuously if education facilitates the child's natural interaction with society and the environment.

Comparing **creativity according to the creativity test** in gifted Estonian and Finnish children we noticed that the creativity of Finnish children was significantly higher in originality, flexibility and elaboration (Figure 2). Gifted Estonian children received the highest points and the lowest points in productivity whereas Finnish children obtained a good average in productivity without any poor results. Although there are no age points in Torrance Creativity test one



reason for the better test results might be the age difference: Finnish children who were tested at the age of 8 or 9, compared to the Estonian children, who were tested at the age of 6 to 7. From the next figure we can conclude that the first school years in Finnish schools are not destroying this kind of creativity when comparing Finnish schoolchildren with Estonian pre-school children.

**Figure 2: Creativity means for Estonian and Finnish Gifted Children**



There seems to be a connection between creativity and giftedness. In our research the correlation between giftedness and originality (Table 1) was significant at the 0.01 level (2-tailed). The more gifted the child, the more original value his/her product had.

**Table 1. Correlations between creativity and giftedness in gifted Estonian and Finnish children**

		Originality	Raven IQ
Originality	Pearson Correlation	1	0.377**
	Sig. (2-tailed)	0	0.003
	N	59	59
Raven IQ	Pearson Correlation	0.377**	1
	Sig. (2-tailed)	0.003	0
	N	59	68

\*\* Correlation is significant at the 0.01 level (2-tailed).

Data analysis of our project revealed some differences in the four components of creative thinking of highly gifted children (IQ 134–144) and gifted children (IQ

120–133). The originality of the creative thinking of highly gifted children is about a third higher than the originality of the creative thinking of gifted children. This suggests that highly gifted children generate new and clever ideas, and more frequently try to find unusual and original solutions to problems. A difference in other components of creativity can also be observed, but this is considerably smaller. When we compared the assessments of teachers and the results of the creativity test, one of the most interesting findings was that creative gifted children in both countries had significantly fewer special problems concerning their behaviour in a group or classroom (significance 0.004 with originality, 0.276 with productivity; 0.015 with flexibility and 0.001 with elaboration).

Comparison of **the parent questionnaires** and the results of the creativeness test revealed that Estonian children who spent more time with their mothers complement their ideas with interesting details; their thinking process is characterised by elaboration. Estonian children whose fathers had spent much time with them are characterised by originality of thinking and finding uncommon solutions to problems. Those children who spend more time with their fathers are characterised by elaboration of thinking when we look at both countries together (Table 2).

**Table 2. The correlation between elaboration and time spent with fathers of gifted children in Estonia and Finland**

		Father and child often together	Elaboration
Father and child often together	Pearson Correlation	1	0.276 *
	Sig. (2-tailed)	0	0.041
	N	62	55
Elaboration	Pearson Correlation	0.276*	1
	Sig. (2-tailed)	0.041	0
	N	55	59

\* Correlation is significant at the 0.05 level (2-tailed).

The comparison of the results of creativeness with the assessments of parents of the relations of their children with their age peers revealed that children who have achieved high originality of thinking seek out the company of others most. The least sociable proved to be children with low flexibility of thinking. Low flexibility and originality of thinking occurred in children who were rejected. It is noteworthy that children who preferred their own company scored exceptionally highly in elaboration of thinking, but received the lowest scores in flexibility and speed of thinking.

Media is an important educator of children. On the basis of **the parents' assessments** a strong correlation occurred between different indicators of musical giftedness and TV music programmes the child had watched, which clearly implies the child's interest in musical activity and performing.

Our study shows that intellectually gifted children are very inventive, industrious, talkative, amiable, bold, defensive, gentle and optimistic. In the assessments Finnish parents attach special importance to their children being open and sociable. Almost 80 per cent of the Estonian parents confirmed that their child was gifted in one field or another; the majority mentioned music or art. According to the parents, their child either sings or draws well. It also appeared that the Estonian children watched more television than the Finnish children. The Estonian children are less interested in children's programmes and considerably more in serials and news programmes than the Finnish children. In addition, they prefer playing more board games and computer games. The rapid movement in Estonian society might be one reason for this. The Finnish children preferred various role-playing games and spent more time playing outdoors (Vikat, Ruokonen, Noormaa, Toro, Vennik 2001.)

In both countries there was a significant positive connection between the creativity of gifted children and the homes where a child was encouraged and supported. Creativity is part of every person's makeup, but very often the development of creativity is restricted by inhibitions. In families where parents take into account a child's wishes, where they are interested in the child's activities and promote the child's readiness to take risks, be it openness to new information, or boldness in thinking and acting in his or her own way, a favourable environment is created for the development of a child's creativity. According to **teacher's assessments** in both countries there was a significant correlation between competence in arts and other important competence areas of school life (Figure 3).

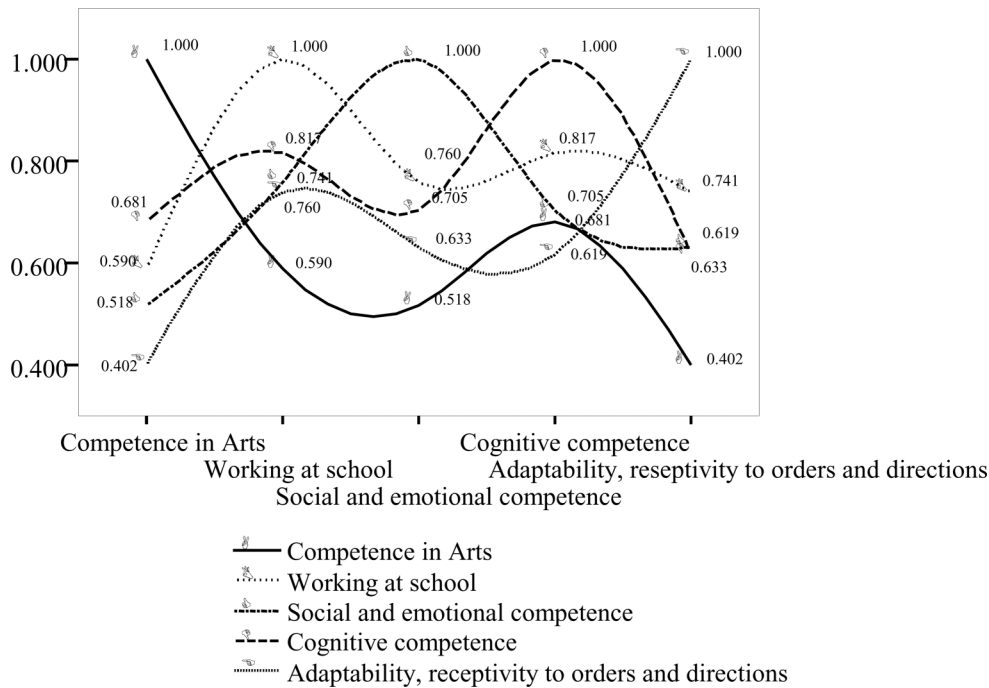
Teachers were also asked to give the five most important criteria for identifying a talented pupil. Most of them (85%) mentioned creativity as one of those criteria. Competence in creative arts, for example music, art, drama, crafts, seems to be strongly correlated in both countries with cognitive competence, work at school generally and using one's skills independently without instructions. When comparing the countries it is interesting to note that there was a higher correlation between competence in arts and social and emotional competence among gifted children in Finland (0.790\*) than in Estonia (0.314).

One of the main tasks of the school is to create an environment that enables a child to encounter and solve many complex cognitive, as well as social problems and situations. Teachers need to recognise the developmental level of individual children. There were no reports of underachievement in arts in teachers' assessments or descriptions. Arts are not assessed at the pre-primary-level, which is a good thing. It leaves space for individual creativity for every child and gives opportunities for imagination and play when a child needs them. In later school years it might be a good question to ask if the school offers scope to artistically talented pupils. This depends among other things on teachers, curricula and resources.

Schools can develop strategies to promote a positive ethos for example by encouraging pupils to think positively about school and by helping them to develop each student's individual potential (West & Pennell, 2003, 178–184). Anne West and Hazel Pennell (2003, 195–197) suggested a number of policies

and practices to avoid underachievement and to improve achievement at all levels. For example, the government should provide greater financial incentives to schools for students' individual needs, and schools should maximise their resources by sharing expertise and working more co-operatively.

**Figure 3: Correlations between competence in arts and other school skills of gifted children in Estonia and Finland**



**The musical ability of children** was measured by Lotti's musicality test, in which children repeat clapped and sung rhythms, intervals and melodies, and sing a song. The results of highly gifted children proved somewhat better in the rhythm tests, whereas gifted children were more successful in the musical ear and expressive singing tests. Finnish gifted children in this group were more talented in musical abilities than the Estonians, but this may be due to the fact that over half of the sample of Finnish children came from a music play school and 9 of them had even started their instrumental studies in a music school (Table 3).

There were no significant differences in the level of musicality between the two groups of children who were divided on the basis of their IQ scores. In our research group in both countries gifted girls were better in musicality than boys; the correlation was significant at the 0.01 level (2-tailed). This is an interesting point because in Raven's test boys scored the highest points.

Musical ability was connected with creative thinking at all levels but there was a significant correlation at 0.05 level (2-tailed) between musical ability and flexibility (Table 4).

**Table 3. The musical ability and IQ of gifted children in Estonia and Finland**

Country			IQ(lower)	IQ (higher)	Total (N)
			120–134	134–144	
Estonia	Musical Ability	0–25	13	4	17
		26–50	14	4	18
	Total (N)		27	8	35
Finland	Musical Ability	0–25	9	2	11
		26–50	13	9	22
	Total (N)		22	11	33

**Table 4. Correlation between musical ability and flexibility of gifted children in Estonia and Finland**

		Musical Ability	Flexibility
Musical Ability	Pearson Correlation	1	0.299*
	Sig. (2-tailed)	0	0.021
	N	68	59
Flexibility	Pearson Correlation	0.299*	1
	Sig. (2-tailed)	0.021	0
	N	59	59

\*Correlation is significant at the 0.05 level (2-tailed).

**The interviews of gifted children** show that 12 of the 32 Estonian and 22 of the 32 Finnish children sing or play music as their hobby. Estonian children mentioned choir singing as their hobby more often than Finnish children. Only some Estonians played instruments; they mentioned violin and piano. Twenty Finnish children had studied at music play school in their early childhood. Finnish children mentioned instrument playing more often as their hobby than Estonian children. Instruments played by Finnish children included the violin, cello, piano, guitar and flute. According to children’s descriptions, the parents of those children who played instruments were active in their child’s activities. Their role was to encourage them to practice and to transport their child to the music school or private lessons.

In the interviews children reported that their musical environment contained many aspects. All children mentioned that music surrounded them at home; they reported interaction with radio, TV, CDs and computer games with music. Live

music was heard in homes where children had musical activities; children practised their instruments and parents sometimes played with them, for example, four-handed piano. One 7-year-old Finnish girl said: *“It is nice to relax with mother and laugh about silly things. I also enjoy it when we play four-handed piano pieces together”*. When children were asked if their parents sing for them, only some of them said it is common. One 6-year-old Finnish boy said: *“My mother used to sing to me in the evenings when I was younger, but not any more”*. Children described more official singing situations, such as this 6-year-old Estonian boy: *“My father sang to my mother on Mother’s day, and I was also singing”*. Another 7-year-old Estonian girl said: *“When someone has a birthday my mother sings her special song”*. There were no descriptions of everyday singing, for example while cleaning, in the shower or while cooking. Estonian children described more singing situations than the Finnish. Three children mentioned that the whole family sung while driving in the car. Children had a few descriptions of live concert situations. These descriptions came from those children who had studied music. Most of the children described their pre-school and school as a place where singing took place especially in Estonia, where almost all children valued their music lessons in kindergartens. In Estonia there are specialised music teachers in every kindergarten and singing is a fundamental part of everyday life in day care centres.

According to children’s interviews music from the media is increasingly a feature of children’s musical environment at home. The everyday singing culture is in danger if parents, for example, think that a 6-year-old child is so ‘grown-up’ and doesn’t need her/his evening song any more. The absence of live music is cause for concern especially with children who do not engage in any musical activities. Educationally it is a great challenge for schools to create an active, live music environment for all children and to provide challenging opportunities to those who are musically talented. According to children’s descriptions, children who engaged in musical activity such as instrument playing, described more their practising habits than their creative processes with music. Only four children reported that they improvise and compose music. Children also drew one picture of themselves engaged in a musical activity and one picture of musicians. The pictures show that musicians are seen as culturally important and creative persons, whereas children usually draw themselves practising some instrument in the pupil’s role. One important factor which appeared from the interviewed data was that children frequently connected playfulness with creative activities or the arts. One 7-year-old Estonian girl said: *“When I’m playing I always imagine many things... I start to create for example a new building or to decorate my room to make it suitable for a princess”*. Or according to a 7-year-old Finnish boy: *“Yesterday, when I practised this composition with my cello I imagined that a big storm was coming and I got the strong wind into my strings and music”*.

According to Lev Semenovic Vygotsky (1930/1990) imagination is the internalisation of children’s play, it is working together towards a common goal. Individual ideas are brainstormed and compounded. Creativity may be at its best

when children in a group cooperate and use their playful imagination to accomplish a given task.

## 5. Discussion

Estonia and Finland have a similar cultural environment but a different ideological background. Estonian families and the educational system have recently faced many changes and challenges in a rapidly developing society. The purpose of this research was to focus on the education and learning environment of gifted children in both countries. Creativity is a powerful form of motivation and we wished to discover the kind of creative thinking these gifted children have and what relationships exist between giftedness, creative thinking, gender, and musical ability in two comparable countries.

There were few essential differences between gifted children in Estonia and Finland. Finnish children were better in creative thinking (see Figure 2) though this result can be questioned owing to the absence of age discrimination in the Torrance creativity test. If we do not compare the two countries the results of this test show that the creative thinking of gifted children increases with age during the first years of school. The other reason for this might be the longer tradition of child-centred education in Finland. According to Juhani Hytönen (2002) child-centred pedagogy relies on respecting individuality, and sees the child creating his/her own learning environment through supportive education. This tradition is well-known and also in use in Estonia nowadays, but the long tradition of the Soviet educational system based more on the authority of teachers, and change in educational practices is slower than the goal-setting system.

Creativity seems to be an important indicator of giftedness. The correlation between originality and creative thinking was the highest (see Table 1), and a correlation in other components of creativity was also seen, but not a significant level. The originality of creative thinking of highly gifted children proves the fact that highly gifted children try to generate new ideas and find original ways to solve problems more often. More individual solutions in the educational system, where single solution responses are not always demanded could perhaps provide more space for this kind of original thinking of gifted children.

In both countries time spent together with parents seems to be valuable for developing creativity. One should focus both on the timing and the quality of that time. It was not possible to analyse the quality of interaction but according to the parents' questionnaires it can be supposed that the interaction climate is good and time spent together becomes valuable for a child. Mothers spent more time with their children but it is important to stress that time spent with fathers is as important for the development of creativity in a gifted child.

According to teachers' assessments creative gifted children had less problems acting in a group. It may be supposed that those children have perhaps more creativity in solving problems and discovering positive learning activities. One

interesting finding was that especially those gifted Finnish children who had good competence in arts also had good social and emotional competence at school or pre-school. Perhaps creativeness provides more opportunities and ideas for gifted children to find out positive and active learning situations in a group. Alternatively it is possible that creativity is at its highest when children cooperate together. Arts education is a powerful form of creative education and our concern is the lack of arts education in the curriculum at later school years. According to teachers' assessments competence in arts correlates significantly and positively with other areas of schoolwork (see Figure 3) and in Finland especially with social competence.

Each individual is characterised by a certain amount of musical giftedness, but the level of development of musical talent differs. Various components of musical giftedness appear and develop at different speeds as a result of different influences. It appeared from the research results that children's intellectual giftedness does not always coincide with their musical giftedness. Musical ability in gifted children had correlated positively with creativity at all levels but only the correlation with flexibility was significant (see Table 4). We suppose that children with higher musical ability and creativity have flexible ways of producing different musical ideas and an ability to generate a range of alternative ideas. This is important especially when children are interpreting music.

Half of the gifted Finnish children had participated in music play-school activities and many of them had already learned to play an instrument. This might account for their higher points in the musical ability test. It also suggests that the learning environment of gifted children is strongly connected to their musical ability. In both countries gifted girls were better in the musical ability test than boys, which may well be due to environmental or educational factors rather than gender.

We also wished to find out how gifted children describe their learning environment concerning music. According to interviews of gifted children their musical learning environment had many aspects. There were not many essential differences between the descriptions of children between Estonia and Finland. Estonian children valued more the singing and music education of kindergartens than Finnish children. In Estonia specialised music teachers take care of music education and in Finland music education is done by non-specialist kindergarten teachers. In both countries those children who took part musical activities, such as playing an instrument or choir singing provided more descriptions of their creative processes with music. These creative moments with music were often connected with imaginative playfulness during practice. We noticed especially that singing within families is in danger of disappearing while the media's role in families as a form of musical environment is growing. More analysis and criticism concerning the media should be carried out among parents and teachers to increase their awareness of its hidden educational effects.

We agree with A. Pugh (1998) and P. B. Onahian (1977) that the home is the most important early source of mental and physical experiences that influence the



development of cognition and perception, but we also wish to emphasise that music from the media is increasingly part of children's musical environment at home, and teachers play an important role in the education of creative thinking in the arts. According to F. Gagné (1999), the role of environmental catalysts such as parents and teachers and spare time activities are important in developing ability. Gifted children often show their potential at remarkably high levels when compared with others of their age, experience or environment. Gifted learners need special and varied support and different challenges, so optimal learning environmental conditions are very important in the early years.

At present music is an integral part of a child's life in family experience, the media, the day-care programme and the school curriculum. Music enters play and organised recreation and creativity of children. Much musical experience takes place outside classrooms and can be directed by any kind of formal syllabus. The formal system of music education should raise consciousness and explore all musical activities around children's lives. Music education should help to create musical existence of each child and community.

Knowledge of children's own experiences and descriptions of learning and learning situations in different environments is valuable for finding opportunities for more individual and effective learning, for developing curricula and creating new learning environments.

We consider that identifying the potential and the visible or audible special aptitude, is of central significance in determining artistic giftedness. Material and information must be collected from various sources, such as schools, homes and hobby environments. Finland and Estonia have many similarities but the speed of development and social change in the two countries is different. For encouraging creativity and ability in music, families and teachers are important motivational sources for the development of gifted children in both countries.

Co-operation between art education systems of schools and communities, financing by the society and enterprises, the opening of doors and the removal of barriers enable the creation of special curricula for children with special aptitudes and the provision of opportunities to fully develop their abilities. Every child should be able to harness his or her internal motivation without oppressive future goals. Activities that children experience as challenging, pleasant and enticing motivate them to continue their hobby or to develop their special aptitude by turning professional later on.

There is no simple solution concerning the validity, reliability, representativeness of evaluation or assessment of creativity. However, often too little data is too extensively interpreted; we need assessment, evaluation, self-evaluation and discussions in order to better understand the importance of the creative learning environment not only for gifted children but for everybody.

## 6. Conclusion

In conclusion, pre-school age as a basis and start of a child's development deserves thorough research into the complex phenomenon of giftedness. Children need encouragement and rewards that reinforce creative behaviours and imagination. Gifted children need to spend time together with their parents. Creativity grows from different meaningful moments together with family members, at school or spare time activities. Especially boys need positive encouragement in musical activities. The importance of emotional and social education is valuable at all stages of development and it can be connected to various subjects especially with the arts. Teachers need to support original ideas to ensure that creative problem-solving becomes an intrinsically satisfying, pleasant and valued experience to be sought for its own sake. Constructive evaluative feedback should be planned so that the self-esteem of pupils is preserved, and their motivation, playfulness and love of learning is nurtured.

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## References

- Davidson, J. W., Moore, D.G., Sloboda, J. A., Howe, M. J. A. (1998) "Characteristics of music teachers and the progress of young instrumentalists". *Journal of Research in Music Education* 46, 141–160.
- Freeman, J. (2000) "Children's talent in fine art and music – England". *Roeper Review* 22, 2, 98–102.
- Gagné, F. (1993) "Constructs and models pertaining to exceptional human abilities". In *Handbook of research and development of giftedness and talent*. 63–85. Keller, K. A., Monks, F. J., Passow, A. H., eds. Oxford: Pergamon Press.
- Gagné, F. (1999) "Nature or nurture? A re-examination of Sloboda and Howe's (1991) Interview study on talent development in music". *Psychology of Music* 27, 1, 38–51.
- Gardner, H. (1983) *Frames of mind. The theory of multiple intelligences*. London: Heinemann.

- Gowan, J. C. (1977) "Background and history of the gifted-child movement". In *The gifted and the creative a fifty-year perspective*. 5–27. J.C. Stanley, W.E. George, C.H. Solano, eds. London: The Johns Hopkins University Press.
- Guilford, J. P. (1979) "Intelligence Has Three Facets". In *Cognitive psychology with a frame of reference*. 16–25. J. P. Guilford, ed. San Diego.
- Heinla, E. (1993) "Eesti kooliõppilaste loovuse mõõtmistulemustest". [The creativity test of Estonian school children.] *Haridus* (Tallinn) 3, 38–41.
- Howe, M. J. A., Sloboda, J. A. (1991a) "Biographical precursors of musical excellence: an interview study". *Psychology of Music* 19, 3–21.
- Howe, M. J. A., Sloboda, J. (1991b) "Young musicians' accounts of significant influences in their early lives: 1. The family and musical background". *British Journal of Music Education* 8, 1, 39–53.
- Hytönen, J. (2002) *Lapsikeskeinen kasvatus (4.–6. Reprinted version.)*. [Child centred education.] WSOY: Porvoo-Helsinki.
- Jorgensen, E. R. (1997) *In search of music education*. Chicago: University of Illinois Press.
- Juvonen, A. (2002) "Musikaalisuus". [The musicality.] In M. Anttila, A. Juvonen *Kohti kolmannen vuosituhannen musiikkikasvatusta*. 64–77. [Towards the music education of the third millennium.] Joensuu: Joensuu University Press Oy.
- Karma, K. (1984) "Components of auditive structuring – towards a theory of musical aptitude". Helsinki: Sibelius-Academy. [Manuscript, musicality test, manual.]
- Kurkela, K. (1993) *Mielen maisemat ja musiikki*. [Music and landscapes of the mind.] Helsinki: Hakapaino Oy.
- O'Neill, S. (1997) "The role of practice in children's early musical performance achievement". *Does practice make perfect? Current theory of reward on instrumental music practice*. 53–70. H. Jorgensen, A.C. Lehmann, eds. Oslo: NHMs skriftserie.
- Lotti, T. (1988) *Musikaalisuus ja musiikkiopinnot. Jäljittelyyn perustuva musikaalisuuden arviointi musiikkikoulun pääsykokeena ja opintomenestyksen ennustajana. Väitöskirja*. [Musicality and music studies. The connections of the imitation based musicality test to the success of studies at music school. Dissertation.] (Tutkimuksia, 119.) Helsinki: Helsingin yliopiston kasvatustieteen laitos.
- Maslow, A. (1968) *Toward a psychology of being*. New York: Van Nostrand.
- Mouchiroud, C., Lubart, T. (2001) "Children's original thinking: an empirical examination of alternative measures derived from divergent thinking tasks". *The Journal of Genetic Psychology* 162, 4, 382–401.
- Ohanian, P.B. (1977) "A musically and artistically talented family nearly half a century later". In *The gifted and the creative a fifty-year perspective*. 66–72. J. C. Stanley, W. E. George, C. H. Solano, eds. London: The Johns Hopkins University Press.
- Pugh, A., Pugh, P. (1998) *Music in the early years. Teaching and learning music in the first three years of school*. London: Routledge.
- Raven, J. C. , Court, J. H. , Raven, J. (1983) *Manual for Raven's Progressive Matrices and vocabulary scales, section 2. Coloured Progressive Matrices*. London: H. K. Lewis & Co. Ltd.
- Rogers, C. R. (1961) *On becoming a person*. Boston, MA: Houghton Mifflin.
- Sefton-Green, J., Sinker, R. (2000) *Evaluating creativity*. (The Arts Council of England.) London: Routledge.
- Simonton, D. K. (2000) "Creativity: cognitive, personal, developmental and social aspects". *American Psychologist* 55, 1, 151–158.
- Sloboda, J. A. (1985) *The musical mind. The cognitive psychology of music*. (Oxford Science Publications.) Oxford: Clarendon Press.
- Sternberg, R. J. (2000) *Practical intelligence in everyday life*. Cambridge, UK, New York: Cambridge, University Press.
- Suzuki, S. (1973) *The Suzuki concept*. Berkley: Diablo Press Inc.
- Swanwick, K. (1991) *Music, mind, and education*. London: Routledge.
- Torrance, E. P. (1962) *Guiding creative thinking*. Englewood Cliffs: Prentice Hall.

- Torrance, E. P. (1974) *The Torrance test of creative thinking*. Bensenville, IL: Scholastic Testing Service.
- Uusikylä, K., Piirto, J. (1999) *Luovuus. Taito löytää, rohkeus toteuttaa*. [The ability to find, the courage to carry out.] Juva: WSOY.
- Vanarum, E. (2002) 6-aastase andeka lapse loovus ja kasvukeskkond. Bakalaureusetöö. [The creativity and developmental environment of 6-year-old gifted children. BA Theses.] Tallinn: Tallinna pedagoogikaülikool. [Manuscript.]
- Vennik, M. (2001) 6-8 aastaste andekate laste loovus. [The creativity of 6-8-year-old gifted children] Bakalaureusetöö. Tallinna Pedagoogikaülikool. Kasvatusteaduste teaduskond. eelkoolipedagoogika õppetool.
- Vikat, M., Ruokonen, I., Noormaa, E., Toro, M., Vennik, M. (2001) Andekas laps ja tema arengufaktorid. [The gifted child and the developmental factors.] In *Väikelaps ja tema kasvukeskkond II* [Gifted child and the developmental environment II]. 155–169. M. Veisson, ed. Tallinn: TPÜ kirjastus.
- Vygotsky, L. (1990) "Imagination and creativity in childhood (1930)". *Soviet Psychology* 28, 1, 84–96.
- West, A., Pennell, H. (2003) *Underachievement in schools*. (School Concerns Series.) London: Routledge.
- Zdzinski, S.F. (1996) "Parental involvement, selected student attributes, and learning outcomes in instrumental music". *Journal of Music Education* 44, 1, 34–48.