

9th International Conference on Music Perception and Cognition

Alma Mater Studiorum University of Bologna, August 22-26 2006

The early development of three musically highly gifted children

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ABSTRACT

The paper deals with aspects of development of three musically highly gifted children. It concentrates on the developmental relevance of intelligence, musical fascination, musical training and the need for appreciation. All three children are participating in a qualitative longitudinal study on the phenomenon of musical giftedness. General methodical characteristics and central questions of the project will be drafted. In the conclusion, the dense network of musical and non-musical dispositions and environmental factors will be discussed, which seem to determine the rapid musical development of the children.

Keywords

Musical giftedness, musical development.

INTRODUCTION

Developmental psychology of music is mostly based on cross-sectional studies, which relate specific musical abilities to an average minimum age. Due to strong individual differences, rules can be formulated at an elementary level only. Therefore, it seems to be reasonable to pay more attention to the musical development itself (cp. Schwarzer 2000). Processes and influences on development can best

In: M. Baroni, A. R. Addressi, R. Caterina, M. Costa (2006) Proceedings of the 9th International Conference on Music Perception & Cognition (ICMPC9), Bologna/Italy, August 22-26 2006. ©2006 The Society for Music Perception & Cognition (SMPC) and European Society for the Cognitive Sciences of Music (ESCOM). Copyright of the content of an individual paper is held by the primary (first-named) author of that paper. All rights reserved. No paper from this proceedings may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information retrieval systems, without permission in writing from the paper's primary author. No other part of this proceedings may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information retrieval system, without permission in writing from SMPC and ESCOM.

be investigated by longitudinal studies. Research designs of longitudinal studies are often relatively complex, thus a very small group of subjects is involved. For this reason only hypotheses can be formulated which seem to be slightly disconcerting at first view. However, in the field of musical giftedness it appears to be essential to develop questions and hypotheses through qualitative research before verifying them in quantitative designs later on.

AIMS

The survey aims to describe musical development in gifted children and intends to derive typical patterns. A further objective is to generate general hypotheses for processes and influences on musical development. According to an implicit hypothesis, general attributes of musicality are extremely obvious with musically gifted children.

METHOD

The project consists of three case studies on musically gifted children, ranging in age from 5-7. First, data was collected for a period of two years. I met the first child, "Martin" (8;3 years old) through colleagues, the other two children „Sarah“ (6;10) and „Tadeus“ (7;4) through a German web forum for parents¹. In all three cases, the parents were my first source of information. Later on, the children's instrumental teachers confirmed that the children were extraordinarily gifted in music.

Martin plays piano and sings in a choir for boys. He can spontaneously harmonize familiar melodies on the piano, improvise in complex harmonies, compose, and can correctly specify chords and keys of pieces he heard due to his absolute pitch. Martin's mother is an oboist and his father is a composer. Sarah plays the violin and the piano. She practices very efficiently. Thus, she learns violin pieces

¹ The children's names have been changed

very quickly and is able to perform them. Additionally, she memorizes the piano accompaniment, can imitate them and notices every mistake. Sarah already interprets music in a very dramatic way which is rich in contrasts. Sarah's mother is a pianist and her father is a chef. Tadeus also plays the violin and composes on the computer. However, his musical activities mostly focus on the scientific occupation with instruments, composers and music theory. In addition, he listens to music with a lot of attention and passion, just like the two other children. Tadeus' mother has a degree in media sciences and his father is a computer scientist.

Meetings with all children and their families take place every three months and last several hours or even days. Data is gathered by means of observation, standardized tests, questionnaires and oral interviews with parents and teachers. The observations are guided by central questions, mainly about the children's musical and non-musical abilities, interests, motivation, social behaviour and environment. The data collection regarding Martin has been completed in March 2006, for Sarah and Tadeus data will still be collected until the end of 2006. Among other things, the children's intelligence was tested with the „Hamburg Wechsler Intelligenztest für Kinder“ (HAWIK), the German version of the “Wechsler Intelligence Scale” (WISC). Their musical abilities were tested with the “Music-Screening” (Jungbluth & Hafen 1997) and the “Wiener Test for Musicality” (Preusche, Längle & Vanacek 2003). In addition, some non-standardized musical tests were applied. The questionnaire for parents contains open questions about current musical and non-musical activities and abilities of their children. This questionnaire has been applied every three months. The interviews with parents, caregivers, school teachers, instrumental teachers and other adults from the children's environment are based on the same central questions as the observations. In addition, the interviews investigate developmental processes and stages. The observed data is being recorded in a research diary, the interview data in transcripts and the test results in test logs.

The filed data is used to develop hypotheses which can be allocated to the following superordinated questions: How can musical giftedness manifest itself in early childhood? Are there connections between musicality and other abilities and character traits? What is the origin of high musical abilities and how do they develop? Some results regarding the latter question will be presented and discussed.

RESULTS

First, data consists of a very detailed documentation about the musical and non-musical development of each child. The early developmental stages were each reconstructed in an initial interview with the parents and are in part additionally documented by early home videos or other visual material (photographs, paintings or artworks). The later developmental stages could be documented simultaneously within the period of data collection. Table 1 contains ex-

cerpts of the documentation of Martin's development from birth to 7;9 years of age.

Table 1. Selection of Martin's developmental stages

Age	Musical development	Non-musical development
0;6		Physiotherapy because of delayed motor development
1;4	Hums complete nursery songs with correct intonation	Gradually starts to speak
1;10		Asks about letters
2;3	Sits regularly on his father's lap for long periods of time and concentrates while his father plays the piano and sings	Asks about numbers
2;7	Turns the pages of Schumann and Schubert scores at the right time	
2;9	Allocates fragments or scores he heard to the correct German art song	
2;11	Listens closely to “Freischütz” every day while looking at the piano scores	Starts to read words
3;4	Combines triads on the piano in a way that makes sense harmonically	
3;6	Imitates “Freischütz”, improvises with chord progressions and suspension chords	Starts to communicate only after more than one year in nursery school
3;7	Harmonizes Christmas carols by ear	Is only now able to dress and undress himself
4;0		Reads fluently
4;3	Likes to listen to “Siegfried”, is completely absorbed by imagined music	
4;4	Starts piano lessons	
4;6	Likes to listen to “The Abduction from the Seraglio” and “The Bartered Bride” (opera visit)	Needs a lot of time for practical tasks in nursery school
4;11	Fractionises a diminished seventh cord from the “Flying Dutchman” into single notes by ear	
5;0		invents “Gabu”, a

		fantasy world, reads thick books
5;3	Teaches himself to read and write notes with the music notation software "Sibelius"	
5;8	Likes to listen to George Crumb, imitates his music	
5;10	Fractionises an atonal six-tone chord by ear into single notes, starts opera projects "Pettersson & Findus" and "Harry Potter"	
6;1	Plays four-handed Haydn symphonies with his father	Last treatment because of delayed motor development
6;3		Can ride a bicycle, elementary school enrolment
6;7	Starts to sing in a choir for boys, is interested in jazz harmonies	Has orientation problems in everyday school life
6;10	Composes a piano piece, invents ad hoc a second voice for songs	
7;4	Begins to improvise jazz	
7;7	Composes choir arrangements for Christmas carols	
7;9	Plays "Ave Verum" by heart with all four voices	

Martin's development makes it obvious that an early developmental advantage in the field of music does not necessarily accompany a generally accelerated development. Martin had developmental deficits with gross motor skills as well as with social and practical tasks. Sarah and Tadeus have also had problems in all three areas in the course of their development. Sarah needed physiotherapy as a baby and learned to walk late. Up to the present, both Sarah and Tadeus do not have many friends of the same age; in school they often attract attention, because they need much more time than other children for practical things such as packing their things or getting dressed.

Martin's development is distinctly advanced when it comes to letters and numbers (see table 1). At the age of four, he was already able to read. At age five he read thick books such as "Harry Potter", "Momo", "Kalle Blomquist". The other two children were also interested in numbers, letters and music notation at an unusually early age. Sarah learned the letters at the age of two, at age three she started to read numbers, at age four words and sentences and at age five music notation. At age two Tadeus recognized numbers

and letters, at nearly three years of age he could write the first letters and at the age of four sentences and notes. Today, Tadeus reads specialized books for children such as the German series "What is What?". Sarah reads comic strips such as "Asterix", "Lucky Luke" and "Donald Duck".

The development of Tadeus' musical abilities and interests has very clearly slowed down, at the latest with elementary school enrolment. He even expressed the wish to stop playing the violin. Martin and Sarah also had ups and downs, although they never really questioned their musical orientation.

Intelligence and musical development

All three children are highly intelligent, especially in language and memory. Figure 1 shows the IQ-test-scores of Martin, Sarah and Tadeus. HAWIK is the German version of the Wechsler Intelligence Scale (WISC). It contains subtests for verbal skills and non-verbal performance. Verbal subtests include GK: General Knowledge, FS: Finding Similarities (between items), CT: Calculative Thinking, VT: Vocabulary Test, GC: General Comprehension, RD: Repeating Digits. Performance subtests are non-verbal tasks, all of which are timed. They include PC: Picture Completion, AS: Attaching Symbols (to other symbols), AP: Arranging Pictures (in a reasonable order), AM: Arranging Mosaics, JP: Jigsaw Puzzle. General scores range between 7 and 13 on the y-axis (Figure 1).

All three children scored notably better in verbal than in performance tests. Furthermore, the test results show that Martin and Tadeus performed better in general knowledge, vocabulary and general comprehension than Sarah did. Sarah, on the other hand, scored especially high in tasks which require a good working memory and echoic memory skills. All three children had mostly average scores for visual tasks.

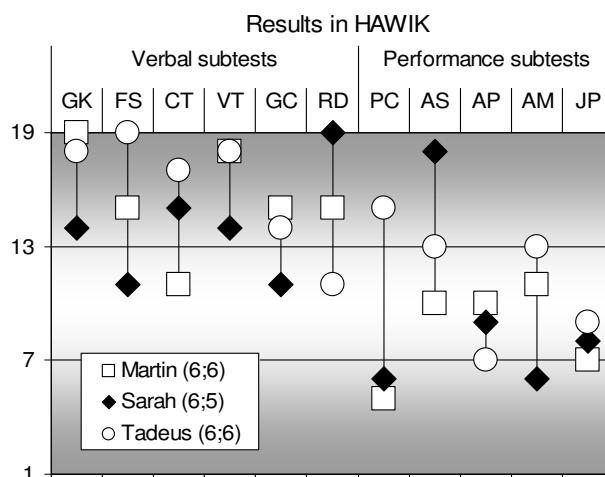


Figure 1. Results in HAWIK-R (Martin) and HAWIK-III (Sarah, Tadeus)

The interpretation of these test results in connection with the individual courses of musical development is not yet completely official. However, Sarah is the one who makes technical progress most easily. Presumably, her excellent working memory helps her to convert the complex instructions of her teachers and her mother. In addition, the acoustic memory skills are probably very useful for the comprehension and rehearsal of instrumental pieces. The long-term cognitive skills that both boys show in HAWIK can probably be attributed to the theoretical music knowledge they have been acquiring for a long time and to their intellectual interest in music. The above-average results of Sarah and Martin in picture completion are surprising. This task depends on exact visual observation and the realization of essential details. This competence does not appear to be connected to the comprehension of musical, i.e. auditory structures. After all, Sarah and Martin in particular realize the essential elements of musical pieces in an astounding way and are able to reproduce them on this basis.

The role of musical training

With all three children, high achievements usually appeared after intensive musical training. Martin, for example, started to listen to the “Freischütz” of his own accord at the age of three. Only after several months of intensive listening was he able to reproduce the voices and harmonies on the piano himself (see table 1). Since the age of 3;7 Sarah practices the violin every day, at the present time even 1.5 to 2 hours a day, and she knows her pieces and is able to control her instrument very well. Tadeus busied himself for months at the age of four alone with the German adventure game and educational software „Opera Fatal“ before he was able to recognize orchestra instruments by their sound, knew their pitch or how they were played. However, these long periods of practice can explain the musical achievements only in part. After all, even the parents are puzzled by their children’s extraordinary motivation to spend so much time in music.

Only the first signs of musical giftedness seemed to emerge abruptly. The parents of all three children could describe such key moments in detail. Martin’s mother was especially impressed when Martin hummed complete nursery songs correctly with 1;4 years, as he was not yet able to speak. His father experienced a musical key moment when Martin could correctly allocate short excerpts and notes to the corresponding German art songs with 2;9 years (see table 1). The first time Sarah attracted attention in the field of music was when one of her brothers practiced an etude by Carl Czerny and she played it herself by heart. Tadeus’ mother describes several early key moments. The first instance, Tadeus crawled into a loudspeaker enclosure in order to hear the music better at the age of 8 months. At the age of 1;8 he surprised his parents by recognizing the sound of the violin in partly complex music and cried each time euphorically “Violin! Violin!”. Such incidences made the parents provide more musical experiences, which in

turn were conducive to further musical achievements. Martin accompanies his parents to concerts and is always given the scores so that he can read the music as he listens. Sarah’s parents regularly buy CDs with famous violinists. Recently she has become very fascinated with jazz, and her parents also provided jazz CDs. At the age of 2;9 years, Tadeus was granted his urgent wish to start violin lessons, although his parents clearly prefer pop music. The parents of Martin, Sarah and Tadeus spend a lot of time, energy and money to foster their childrens’ needs, although the families raise between two and six kids. Similar findings were described by previous researchers (e.g. Bastian 1991, Manturzevska 2006).

Fascination and fanaticism in music

All three children are regularly fascinated by music, which is conducive to their achievements. This kind of fascination cannot be planned. It appears to be an important, maybe the most important trigger for the three children’s early musical activities and skills. Martin’s parents report that they often even had to stop their nearly three-year-old child from intensely listening to music nonstop.

Interviewer: And what did he do with the piano excerpt? Did he listen to the music and want to have the scores in front of him, although he might have not yet understood that much at that time?

Father: [...] With a lot of perseverance partly. “Freischütz”! How long did he used to listen to it? The complete CD? Or maybe half the CD at a time?

Mother: We always had to say „Let’s stop now!“, after the “Wolf’s Glen” or before the “Wolf’s Glen”, I don’t know any more. (laughs)

(interv[03.2004]parents.M)

Sarah’s parents also describe the immense interest of their five-year-old when she pays attention to single passages and instrumental sounds both in classical and in pop music.

Father: [...] “That’s a cool passage“ she would say. “Can I listen to it again?” [...] She pays attention to the single instruments. And can denote them. She can already say “There is a guitar in it”, or “there is a piano in it”. [...]

Mother: And when she doesn’t know an instrument, she asks: “What kind of instrument is this right now?”

(interv[12.2004]parents.S)

Tadeus’ mother reports a long phase during which the two-and-a-half-years-old boy used to sing themes of “Peter and the Wolf” of his own accord every day and played on an imaginary violin which could not produce any sounds.



Picture 1. Tadeus (2;7) playing his first “violin”, a plastic guitar with a drum stick

Mother: [...] There was this plastic guitar he had borrowed from a friend. [...]. Then he just ran around with this plastic guitar and a drum stick and sang this „Peter and the Wolf” theme. [...] He always ran around with it and really from morning to night, and he did this for three months.

(interv[11.2004]parents.T)

All three children’s fanatic dedication to music comes from inside of them and cannot really be explained. However, it makes sense to ascribe this fanaticism to a social and intellectual desire to participate in music and understand it. Possibly, to different extent, the need for appreciation also plays a role. Musical abilities are a very good way to gain appreciation from most parents and grandparents.

Need for appreciation

Martin, Sarah and Tadeus show a distinctive need for appreciation. Accordingly, Martin likes to point out to me what he already knows and can do. This is evident in several notes in the research diary, for example in the following:

Research diary: [...] Instead, he shows me arithmetic problems and explains to me with an air of self-importance how he could calculate the number of squares on the carpet. [...] Then he specifies a newly discovered prime number between 100 and 200. In addition he shows me his self written oboe voice of the Herzogenberg-Trio, which I had heard at our last meeting.

(diary7[09.2005]M)

His teacher confirms this impression with her observations in school.

Teacher: [...] He is always gladly ready to speak in front of groups, it suits him. He is able to announce the daily timetable for the first grade. He stands up in front of the class, he can be so dignified and he is so happy that he is able to do that.

(interv[06.2005]schoolteacher.M)

Sarah often reports her actual abilities at the beginning of our meetings.

Research diary: In the car Sarah asks ”Do you know that I’m pretty good at playing the violin?”, “I often listened to your playing.”. “Yes, but I can play much better since that time!”. This comments are earnest and typical for Sarah. (diary3[06.2005]S)

Tadeus also regularly demonstrates his knowledge of animals, planets or Indian tribes. What is especially noticeable with Tadeus is a large fear of showing weakness. He probably is inured to amaze relatives and grownups beyond his family with peak performances. If he cannot uphold this standard, he gets fits of rage, or he starts to blockade or to almost cry.

Research diary: After playing a very easy piece we try to perform some slightly more difficult duos, which I copied on purpose in a larger size. But only after a few notes Tad comes unglued, because he doesn’t succeed at everything by playing at sight. He rips down the violin from his shoulder and exclaims dramatically and whiningly “Oh, I really can’t manage that!”.

(diary7[05.2006]T)

Most notably Sarah and Martin receive appreciation from within their family appreciation by demonstrating their musicality. Assumedly this is due to the fact that except for Sarah’s father, the parents of both are professional musicians. They are able to evaluate musical benefits easier and react to them more adequately than musical amateurs. In Tadeus’ family it is at least as encouraging to reach parental elation by showing general knowledge, mathematical abilities or chess. Supposedly Tadeus feels that his parents are not very well versed in classical music and concentrates therefore increasingly on other domains.

Stability in meter

In spite of high musical skills, the three children are not yet very stable in meter. In the subtest “Comparison of Meter” within the “Music-Screening”, Sarah (at that time 5;5 years) and Tadeus (5;9) both had a percentile rank of 41, although within a standardization sample consisting of children aged five to eight. When the test was carried out, Martin was distinctly older than the other two (6;10) and received a percentile rank of 75. Throughout this subtest, two sequences, each of which consists of five beats, have to be compared. Then the child is asked: “Do both versions have the same speed or is one faster than the other? If so, which?” A repetition of this subtest with Sarah and Tadeus is intended.

The computer based “Wiener Test for Musicality” (WTM) also contains a subtest to survey the realization of meter. Here, three beats are played, the middle of which can be displaced. The child is asked: “Is the middle beat closer to the first or to the second one or is it exactly in the middle?” In figure 2, the number of the correctly recognized devia-

tions between 100 and 500 milliseconds is recorded in percent (Figure 2).

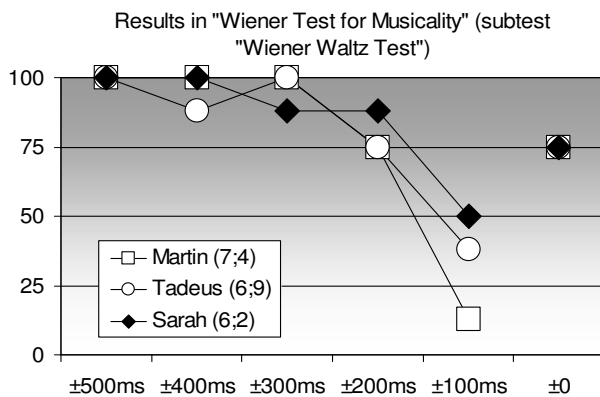


Figure 2. Results in „Wiener Test for Musicality“

Although Sarah was the youngest at the time of the survey, she noticed more small variations in meter than the other two children. This result probably relates to the fact that at that time, Sarah already had more experience in ensemble playing than the other two, which would hardly be possible without a working meter. She plays in small string ensembles and in an orchestra, and her solo concerts are always accompanied by the piano. However, meter competence is probably closely connected to non-musical stages of maturation (e.g. Bruhn 2005), which have to be obtained even by musically gifted children.

CONCLUSION

The presented data plainly shows that the development of the three musically highly gifted children exhibits a striking profile of strengths and weaknesses from the very beginning. Deficits in practical and social competences and in motor skills do not seem to contradict the early development of outstanding musical achievements. However, given the results of the IQ-tests, the hypothesis arises that the high intellectual abilities of all three children contribute to their early musical development. Especially regarding verbal comprehension and long and short term memory, this hypothesis appears to be promising and has already been supported repeatedly by previous research (e.g. Chan et al. 1998, Treharne 2002, Koelsch et al. 2003). An additional conclusion is formulated with caution: namely, that the individually differing memory skills reappear along their musical path. Accordingly, a good working memory such as Sarah's could be especially advantageous for fast progress on an instrument. A long-term development of knowledge and experience is possibly more important for the analytic understanding and the composition of music, both of which are characteristics for Martin.

Another factor that explains the three children's extraordinary musical development lies in the periods of training. Almost all stages of musical development were preceded by a longer phase of intense occupation with music. This is

confirmed by studies in the field of expertise research, according to which professional instrumentalists are more successful based on the amount of time they have spent practicing in the course of their development (e.g. Krampe et al. 1991). Even the first key moments of musical giftedness reported by the parents can presumably be ascribed to latent training. However, it is even more interesting to find out why these children dealt so intensively with music? Here, musical fascination comes into play, which can be seen very clearly with all three children and which seems to trigger active musical activities.

Comparable to Norbert Elias' attempt to attribute W.A. Mozart's genius to his distinct need for love, attention and appreciation (Elias 1993), indications of such a profound need for appreciation can be found with Martin, Sarah and Tadeus, too. Probably most children are looking for appreciation, but, from the very beginning, the musical activities and achievements of these three children have been rewarded with especially positive feedback by their families. In previous studies several researchers emphasize the important role of parental feedback and support for success in music (e.g. Bastian 1991, Moore et al. 2003, Manturzevska 2006). However, the need for appreciation can hardly be solely responsible for the lasting development of musical fascination and for the rapid musical development of gifted children. One can await the results of further research with interest.

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