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I am unable to think flatly, how does this affect the way I make music?

Dyslexia, music and music-pedagogy

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Summary

Does dyslexia have any impact on the music field? Do note reading problems have a connection to the reading difficulties that are common among people with dyslexia?

I wanted to find out how dyslexia works in connection to music and music performance as well as highlight the pedagogical implications this entailed. I have done this through literature studies on the subject and by interviews with 9 musicians with dyslexia. I have also used my own experiences and theories which I developed from being a musician with dyslexia myself and I have related this to the general knowledge in the field and to the results of the interviews.

Knowledge of this subject is not yet comprehensive and Sweden does not seem to be in the forefront when it comes to producing or practicing knowledge on dyslexia and music.

The result of my interviews corroborated largely with the literature and my own experiences. Music is affected by dyslexia and above all by the way we in the west often choose to approach music and music-pedagogy. The way you work if you have dyslexia, which results in dyslexic problems with reading and writing, affects music as well and especially the use of notation. The ability to understand music through notes is adversely affected, which is extremely important to know, especially so that students will not be stopped in, or locked out of, the music area because of misunderstandings.

The way of thinking that people with dyslexia have, can also affect music in a positive way. The quick thinking and proximity to images and creativity that is typical of dyslexics are often beneficial when it comes to musical expression. A freedom when playing by ear or improvising is described positively and in detail, both in the literature and by informants in the investigation. This effect seems to be primary and natural, it does not seem to be explained by compensation for difficulties that dyslexics have in other areas of music.

Key words: Dyslexia, music, music-pedagogy, aural skills, notes, three-dimensionality, brain, hemisphere.

Foreword

”The girl sometimes walked to the black piano.
She played along to the music. She liked to play ‘The six Bullerby Children-song’. Because the girl liked playing the black piano her mother, her father and the girl herself thought it might be a good idea to begin “learning” to play the piano from a teacher...

Every Wednesday the girl walked across the street to the church, where she would sit in the basement on a pile of encyclopedias and books on organs in order to reach the keys.

She thought all those dots were pretty but didn’t quite understand why she had to sit and look at them the whole time. On the page before there was a bird. It was pretty to. When the girl’s baby sister had turned one, her whole body had been covered in dots. Perhaps she had caught it from the girl’s notebook?

When the girl was in the third grade she and her mother and father went to watch a lot of playing instruments. The girl thought this was exciting, the bassoon made a mystical sound, but it had to be the western concert flute. She could hardly control her excitement before the borrowed flute was to be within her reach. But then came the dots again, she couldn’t understand why people kept insisting on them. This time she learnt how they worked but still didn’t quite understand why they had to be there. They were in the way of the music, had nothing to do with the music. You were never allowed to just start playing at once….

But sometimes she ignored the dots and played along to records instead, Corrs, Riverdance, Stefan Nilsson…”

From ”Min bildningsgång” (My education), Susanna Cederquist, fall of 2005

”Knowledge is experience, everything else is information.”
A. Einstein

Here follows a list of people who are commonly mentioned in different sources as having dyslexia.

Wilhelm Pettersson Berger, Albert Aalto, Petter, Whoopi Goldberg, Pablo Picasso, Harry Anderson, Orlando Bloom, Dave Foley, Danny Glover, Tracey Gold, Susan Hampshire, Jay Leno, Keanu Reeves, Edward James Olmos, Oliver Reed, Billy Bob Thornton, Tom Smothers, Robin Williams, Henry Winkler, Loretta Young, Pierre Curie, Harry Belafonte, Ann Bancroft, Alexander Graham Bell, Ingvar "IKEA" Kamprad, John Britten, Selma Lagerlöf, Michael Faraday, Cher, Lisa Ekdahl, Dr. James Lovelock, Winston Churchill, Kung Carl XVI Gustaf, Willem Hollenbach, Sven Wollter, Crown Princess Victoria, Archer Martin, Jan Myrdal, Prins Carl-Philip, John Robert Skoyles, Nelson Rockefeller, Bill Clinton, Jörgen "Björne" Lantz, Beate Grimsrud, Ansel Adams, Leonardo da Vinci, Tomas Jefferson, David Bailey, Walt Disney, Ignacio Gomez, Sif Ruud, Thomas Alva Edison,Tommy Hilfiger, Carl-Gustaf Lindstedt, George Washington, Robert Rauschenberg, Pierre Lindstedt, Percy Nilsson, Auguste Rodin, Albert Einstein, Bennett Strahan, Tom Cruise, Woodrow Wilson, Robert Toth, Henry Ford, Robert Kennedy, David Boies, Kevin Costner, John Lennon, Erin Brockovich, Agatha Christie, Jeffrey H. Gallet, William Hewlett, Jonathan "Stonewall" Jackson, Jackie Stuward, Steven Spielberg, Brad Little, George Burns, Anthony Hopkins, Nigel Kennedy, Bob Weir, Jörn Utzon, Harvey Cushing, George Bush, Fred Epstein, Fred Astaire, Duncan Goodhew, Muhammed Ali, Bruce Jenner, Harrison Ford, Magic Johnson, Greg Louganis, Eino Hanski, Bob May, Lyndon Johnson, Diamond Dallas Page, Jamie Oliver, Steve Redgrave, P C Jersild, Nolan Ryan, John T Chambers, Richard Branson, Craig McCaw, O.D. McKee, David Neeleman, Paul J. Orfalea, Charles Schwab, Ted Turner, F.W. Woolworth, Robert Benton, Nicole Betancourt , Søren Kragh Jacobsen, Michael Heseltine, Andrew Jackson, Thomas Jefferson, John F. Kennedy, Gavin Newsom, Paul Wellstone, Avi, Jeanne Betancourt, Steven Cannell, Larry Chambers, Andrew Dornenburg, John Corrigan, Fannie Flagg, F. Scott Fitzgerald, Gustave Flaubert, Terry Goodkind, Patricia Polacco, Eileen Simpson, Elizabeth Daniels Squire, Bernie Taylor, Charlotta Sörenstam, Tore Wretman, Salvador Dali, Peter Jöback, Benny Andersson, Steve Jobs, Isaac Newton, James Clerk Maxwell, Charles Darwin, John Chambers (Cisco), Lyndon B. Johnson, Werner von Braun, John von Neumann, Quentin Tarantino, Marilyn Monroe, George Patton, Kurt Cobain, William Butler Yeats, Ludwig van Beethoven, H. C. Andersen, the brothers Wright, Stonewall Jackson, Lewis Carroll, Ada Lovelace, Vincent van Gogh, Michelangelo, Mark Twain, Ernest Hemingway, Charles Dickens, Evert Taube, Sven Bertil Taube, Sascha Zacharias, Moa Martinsson, Bertil Hult, "Idol- Kirsti", Nassim Al fakir...

Sources:
www.fg.lund.se, www.kontorsproffs.nu, www.komvux.gotland.se, www.dyslexia.com, http://www.faktoider.nu/dyslexi.html, www.Growingpeople.se, Sohlman, B. (2000), Davis. R. D., (1999), Statement by Kirsti in Idol; TV 4, fall of 2007, Program on UR about dyslexia. Expressen, Aftonbladet and FMLS.

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Introduction

A connection between music and what we call dyslexia, is there even such a thing? The reason why I choose these subjects is that I want to find out if such a connection exists and in that case, what the nature of that connection is. Is it a burden or a gift? Or maybe a combination of the two? As a dyslexic musician, I also have a few thoughts and hunches of my own. Another purpose of this thesis is to see if these could be correct. The subject in itself is one I feel is very exciting, but also very important. The knowledge of dyslexia in a musical context is not very widespread. Bringing such a discussion to the light I see as an opportunity to influence, and maybe even to be a determining factor for coming musicians and hopefully an opportunity to shed a light on a thing or two as well.

My own dyslexia coupled with my long experience of music education has led me to reflect on the subject and in the end come to a few conclusions of my own. I discovered early that there was a possible connection between my slow reading and my slow note reading – that my reading speed in general was reflected in my note reading. I had never heard about this connection from anyone else before Eva Wedin mentioned this possibility briefly in a lecture at the Royal College of Music in Stockholm during the fall of 2002. Why this is, is one of the questions I will try to answer in this paper.

As a child I experienced my piano and flute teaching largely as an education in note reading. It took a long time for me to get a grip on notes and if it had not been for my own music making at home I most likely would not have continued. Not until later have I developed a better understanding for the connection between my reading speeds in these different areas. Sadly, the tutoring I received as a child was almost entirely based on notes and theory. Based on my own experience and the instrument teaching I have come in contact with as an adult, I believe this is still the case today. I however strive to also have another way of approaching the areas that I teach.

Are there others who recognize themselves in my experience of note reading and that feeling of not being allowed to play "for real" until they have managed to get passed "those dots" that they did not really connect to the music? Are there others who have experienced this obstacle and whose journey of musical discovery has almost been ended by this phenomenon?

Could it be that this approach, practically the only one used by many pedagogues here in the west, constitutes an obstacle, which hinders musical development and contributes to narrow-mindedness, which in turn leads to everyone's musicality not being valued equally? Could this led to students of music feeling excluded on nonmusical grounds? Could it be that this approach is entirely based on our environment and on our western way of approaching music through theory? Are there ways in which one could expand the accessibility of music?
To what degree, then, is this connected to dyslexia?

I was, despite the obstacles, very drawn to music. This was a result of the musical experiences I had on my own, when I played by ear. To me, music has always been a language and a way of communicating, in which the auditory part has been of great importance. Writing systems

are all very well but, as the father of modern linguistics, Ferdinand de Saussure, said: "Language lives in the sound" (Ong, 1982, p. 17). This is something I have always felt, also about the language of music. In my opinion there are great opportunities in this area. Could aural skills be another thing that distinguishes the "dyslexic" way of making music?

I feel that this is an area that needs to be discussed and an area of which knowledge needs to be spread. What I suspect is that children and youths could be held back in the musical field by something that actually does not have anything to do with music, and that this is not something that is reflected upon. Through this thesis I wish to contribute to this knowledge.

Because my connection to this subject is so important and special to me I have taken the liberty of diverging from the standard thesis-framework. I have done this with the best intentions and have tried to make the structure as clear as possible. Among other things this has meant that I have used myself and my experiences to a greater extent than might be the norm. I felt it would be wrong to withhold the experiences, knowledge and insights that I have gathered from being dyslexic myself. It has been important to me to make it as apparent as possible for the reader which parts of the text that are based on this experience.

A small introduction for the reader might therefore be in order. This thesis starts with a relatively comprehensive background description where the phenomenon of dyslexia is treated. An understanding of dyslexia is necessary for the reader to appreciate the subjects treated in this thesis, and that is what I am trying to provide in this part. The chapter deals with dyslexia and research concerning dyslexia in general as well as how the specific subject music might be affected and function when it comes to people with dyslexia.

I continue with a chapter where I deal with my own experiences of being dyslexic and my reflections on this. Thereafter comes the investigative part which includes a compilation of the results.

The thesis ends with a part that deals with my personal reflections and conclusions concerning the consequences of the subjects that I have treated. My hope is that this will be of use for music-pedagogues who have or will have dyslexics as students.

In spite of my dyslexia this text has become quite extensive. If you, the reader, are less interested in my experiences and reflections I recommend that you start by reading the investigative part.

Background

What is dyslexia?

The word *dyslexia* comes from the Greek word for *difficulty with words*. Another denomination that is sometimes used is *specific difficulties with reading and writing*. It is a mistake to confuse dyslexia with other kinds of reading and writing difficulties that exist on all levels of intelligence. The fact that dyslexia only exists among people of average and above-average intelligence (Persson, 2002) is often mentioned in different texts, but anyone could of course have dyslexia.

The definition of dyslexia as a disability became official in 1990, partially as a result of the UN declaration that this was to be the "International Literacy Year" (Persson, 2002), which resulted in a social debate. The exact prevalence of dyslexia is hard to estimate as different sources provide different information. The number varies from five percent (www.sprakaloss.se/index) up to a maximum of ten percent (Sohlman, 2000, sp. 69). On average this means that in a class of 25 students there should be one or two dyslexics. In other words you can generally count on there being students with dyslexia in classroom teaching (Andersson, Belfrage & Sjölund, 2006, p.10-11).

What does dyslexia really mean? It is a debated question and not an easily answered one, as there is still no internationally accepted definition (Swedish Research Council, 2006, p.18-19). What causes dyslexia is also a debated question. There are many prominent theories but none have been proven and completely accepted (Personal communication with Dan Alberyd, Institute of Special Pedagogy, 30/1-07). There has been an ongoing conflict within the research on this subject in Sweden. Two main groupings existed at this time: The sociocultural/pedagogical, which argued that problems with reading and writing are caused by "bad" pedagogy and the neurobiological, which emphasized the biological causes (Sohlman, 2000, p. 73). This, along with the uncertainty that prevails today may be the reason why you sometimes find diffuse and unclear statements on dyslexia in some sources. There are theories and methods concerning everything from remaining "infant reflexes" that need to be removed through training to a lack of omega 3, which I myself have experienced.

Different definitions of dyslexia:

As I mentioned earlier there is no entirely accepted definition of dyslexia. Further down I will however include a few that are used. On the webpage of the Swedish Dyslexia Association I found the following definition, formulated by The International Dyslexia Association:

> Dyslexia is a specific learning disability that is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge. (http:/www.ki.se/dyslexi/vad_ar_dyslexi.html)

This definition also exists on the webpage of the Swedish Dyslexia Association (Høien & Lundberg, 1992):

> Dyslexia is a deficit in certain linguistic functions which are important for the ability to use the principles of writing to decode language. The deficit makes itself known mainly as difficulties in achieving automatic decoding when reading. The deficit is also clearly apparent through flawed spelling. The dyslexic deficit is generally passed on through family and one can assume that a genetic disposition lies at the root of the problem. Dyslexia is characterized by the fact that the problems are of a lasting nature. Even if one can achieve an acceptable reading capability, the problems with spelling persist. (http://www.ki.se/dyslexi/vad_ar_dyslexi.html)

The definition by the Swedish Dyslexia Association:

> Dyslexia is a deficit in certain linguistic functions, especially the phonological ones (phonology is the sound-shape of a language), which are important for the ability to use the principles of writing to decode language. The deficit is mainly and most obviously apparent through difficulties in achieving automatic word decoding while reading. But it is also clearly apparent in bad spelling (Kere & Finer, 2008, p. 26)

Davis writes that he has discovered that: ”Dyslexia is a product of thoughts on and reactions to the feeling of confusion” (Davis, 1999, p. 23).

A lot of statements on dyslexia are somewhat consistent, but differences and width do exist. It is clear that different kinds of problems are described in the first three definitions. They also present different views on what can be perceived as difficult and what has caused this difference, a hereditary deficit, a defect or an injury? In Davis’s definition-like opinion there is a clear difference in comparison to the others. He doesn’t see dyslexia as the core, or the “problem” in itself, rather he sees it as a product, a result of something else.

Larger right hemisphere

Put simply we have two hemispheres in our brain, the right and the left. We know that these two hemispheres have partly different functions and process information in different ways. The language centers, mathematical analysis and strategic thinking belong in the left hemisphere. It is here that details are registered and thinking happens in stages, one step at a time. The right hemisphere on the other hand processes form, spatial perception and holistic thinking. Emotions, intuition and imagery as well as artistry and creativity also belong in this hemisphere. With this kind of thinking one is easily affected emotionally by for example music (http://www.qomut.com/hjarna.htm; Fagius, 2001, p. 21-22).

The right and left hemisphere are normally not exactly the same size. The right is most often a little smaller. This is probably not true for dyslexics however. It has been shown that the right hemisphere of people with dyslexia is larger than "normal" (Kere & Finer, 2008, p. 37-38). The language centers, which are normally smaller in the right hemisphere compared to the left, are the same size in dyslexics. The right language centre is larger than normal. The dyslexic brain may hence be more symmetrical (Lundberg & Torleiv, 1999, p. 173, 176).

In most people one of the hemispheres is dominant:

> When it comes to our linguistic competence the left hemisphere is dominant for 96 percent of all right handed people, while the linguistic competence of 15 percent of all left handed people is dominant in the right hemisphere. For 15 more percent the linguistic competence is found in both the right and the left hemisphere. Research has shown that people with dyslexia often have less activity in the left hemisphere when working with language. (Sohlman, 2000, p. 24)

The organization of the brain is crossed and the hemispheres control the opposite side of the body. The right hemisphere mainly controls the left part of the body and vice versa. This also applies to hearing and vision, even though both eyes and both ears have contact with both hemispheres (Fagius, 2001, p. 20).

People with dyslexia think in a way that is dominated by the right hemisphere (http://www.qomut.com/hjarna.htm). It has also been argued that dyslexics have better use of their right hemisphere than others (www.tomatis.com/Svenska/dyslexi.htm). The activity patterns and coordination of different parts are different in dyslexics (Lundberg & Torleiv, 1999, p. 173, 176) and the cooperation between the hemispheres is designed a little differently (Ramel, 2007).

The "dyslexic" "relation of dominance" in thinking could also be reflected in vision, as there is a connection between dyslexia and a lack of dominance development when it comes to vision. As a dyslexic it is normal not to have a dominant eye and to have blurred double vision when reading. Irregular and increased "points of eye fixation" in the text as well as more normal eye movement when reading in the wrong direction or upside down have been observed (Persson, 2002).

There is also research on the brain within genetics where specific "dyslexia genes" are claimed to have been discovered. A person can have these genes without having any of the problems related to dyslexia however (Kere & Finer, 2008, p. 21).

Non-verbal thinking

The result of the above mentioned biological structure with regards to practical thinking indicates multidimensionality. Davis (1999) writes that people with dyslexia think and perceive things multi-dimensionally, with all senses, and mainly think in terms of images rather than words. All people have verbal and non-verbal thinking, one of them being dominant. The images are based on non-verbal thinking, the thinking that dyslexics use. You do not use the verbal thinking, "word thinking", as a base, as most people do to a greater extent. The verbal thinking is linear in time, happens roughly at the same speed as speech and uses the sounds of language. It is built on the fact that, to a larger degree, you hear a voice, like an inner monologue, which carries your thought.

The non verbal image-thinking is a lot quicker than the verbal and thinking happens in a multisensory, three-dimensional movie format (Davis, p. 23-25). According to Davis this image-thinking happens at a speed of 32 images per second, which is faster than the image processing of the TV, at 30 images per second. Hellberg (2002) argues that this image-thinking is three-dimensional; the image has depth, width, and height. The way in which this image-thinking works practically can be seen in the result when someone says for instance the word "elephant". As a dyslexic you refer to a larger degree directly to the image of the elephant, not the word picture, which is generally more used. Hellberg describes how, in this image, you can see the object three-dimensionally, from several angles and move around it freely in your mind. The content of the image can easily be expanded and in your mind it is easy to, for instance, travel to the savannah where the elephant is and stand next to it, look at it from above, walk towards the other animals by the waterhole or see the landscape from the elephant's point of view. The word "elephant", though, is nowhere to be seen, as symbols like letters do not occur naturally in this kind of thinking.

This non-verbal three-dimensional image memory does not work sequentially, which can cause difficulties when it comes to learning things in a particular order. It can also be more difficult to create a figurative understanding of certain words such as those that are abstract or that have multiple meanings. Examples put forward by Davis are prepositions and irregular verbs (203). Davis (p. 25-26) and Hellberg (p.8) suggest that this way of thinking is quiet and that the inner monologue is naturally economical or non-existing and hence needs to be learned. Lundberg too (personal communication 2007) talks about relatively fresh studies describing how people with dyslexia seem to process information in a different way, more visually than verbally, and that a they prefer to have certain information presented to them.

The non-verbal intelligence of children with dyslexia is above average. A careful interpretation might be that dyslexics develop more visual, creative and intuitive methods of learning and solving problems as a way of compensating (Ingesson, Gunnel, 2007).

If we look at the way one memorizes and remembers information through this way of thinking, reading and writing which are dependent on both long and short-term memory are affected. In long term memory we have knowledge of the form and meaning of letters and words as well as syntax. Short-term memory, or working memory, is limited both from a temporal aspect and in the amount of units that can be contained. When it comes to difficulties in reading and writing it seems that it is the verbal short term memory that is affected (Rygvold, 2001, p. 23).

One way in which the memory seems to be affected is through the symbols, or the lack of them, to be more precise. A symbol is a representation of something, an abstract concept, idea or characteristic. Letters in a phonetic alphabet, as well as signs in other systems of writing are symbols, as they represent sounds or words (http://sv.wikipedia.org/wiki/Symbol).

When I listened to Inger Rabeus at a lecture at the Dyslexia Convention in Gothenburg in 2006, she spoke about this – the ability to see words in your mind when thinking. Like Hellberg, she suggests that as a dyslexic you do not see words in your mind. Dyslexics do not see "the cheat sheets" as she calls it, drawing parallels to spelling and word quizzes at school. You do not see the word in your mind, which complicates situations where this is required. Dyslexics simply cannot see and think in symbols like letters to the same extent. Davis (p. 70) and Hellberg (p. 8) claim that the symbols are simply missing in this way of thinking. Rabeus

describes how, if you want to attach letters to an image, they have to be a part of that image. If they are not, they will fall out of the memory picture. An example she mentions are the images she had in her classroom as a child, in which there was an object along with the first letter of the word of that object, with the letter being placed beside. For the letter O to stick in her memory it has to be a part of the owl in the picture, not stand beside it (s. 19).

This is not a question of impaired visual perception or a poor ability to remember visual information. Rather, problems may arise when this needs to be connected to language processing. A study involving Hebrew letters (which were unknown to the test groups) and Swedish letters, demonstrates this. "After a quick glance at a number of short Swedish words the students had to repeat the words in writing. The dyslexics fell behind in this task. When the test was redone with Hebrew words, however, there was no difference between the groups" (Rygvold, 2001, p. 23).

The three-dimensional non-verbal image-thinking which results in the problems of dyslexia also has advantages.

> "What causes a tendency to confuse symbolic information is at other times an asset. Individuals who for instance "see" the multidimensional features in our world understand intuitively how things work. They discover that they have an inherent talent for mending things and understanding engines, electronics, plumbing, constructions, art, and other related areas. Tasks that require the ability to visualize something in a creative or different way are often easy for people with these gifts. This is probably the reason why so many inventors, scientists, athletes and creative people discover that they also have dyslexic symptoms." (Davis, 1999, p. 11-12)

The "positive" sides to this dyslexic way of thinking are not as talked about and explored as the more problematic aspects of this thinking. Ingvar Lundberg (2007) is "rather fond of the idea that people with dyslexia do not only face difficulties but also have some advantages. However, we do not have a solid research basis for this", he claims. It is however said that dyslexia "sometimes comes with talents beyond the usual in other areas – creative imagination, artistic abilities, a knack for technology and constructions" (www.sprakaloss.se/index.htm). Kere and Finer (2008) suggest that it is possible to "speculate around the possibility that the increased size of the right hemisphere could be linked to the fact that many dyslexics have abilities, creative imagination and talents above average." (p. 37-38).

At the web page of the Stockholm Dyslexia Centre, abilities such as practical and creative thinking are presented as prevalent in people with dyslexia. The ability to first see things in their entirety to then think about them in smaller pieces, the strength of seeing things from a different perspective and a strong sense of color are also presented (http://www.stockholmsdyslexicentrum.se/signaler-dyslexi.htm). Stubbornness is another characteristic that has been presented as meaningful in international research connected to dyslexia, and the origin of this character trait has been discussed (Ingesson, 2007).

Hellberg (2002) suggests that the three-dimensional thinking is a great advantage in certain professions (s.8). It gives the person great power of deduction and the ability to quickly see solutions from a holistic perspective. The image-seeing is used especially within all creative professions such as artists and filmmakers. She also describes this as an advantage when you need to diagnose someone as a doctor. Because of the image-seeing, intuitive thinking,

multidimensional thinking and curiosity, Davis (1999) suggests that the creativity of the dyslexic is drastically increased (p. 104). B. Sohlmans (2000) discusses numerous experiences of meeting a lot of very creative people within different kinds of creative professions in TV, who, besides their abilities also had severe difficulties with reading and writing (s. 77).

Davis (1999) suggests that people with dyslexia have some mental functions in common, some characteristics. He claims that dyslexics can use the brain's ability to create change and awareness, which he describes as their basic ability. As a dyslexic you are very aware of your surroundings, more curious than average, highly intuitive and very insightful. Imagination and inventiveness are other traits that he emphasizes in people with dyslexia. He suggests that it is not an accident that Einstein, Bell and Disney did what they did. That they were not "geniuses" in spite of their dyslexia but perhaps even because of it. Davis writes that if these basic predispositions are not repressed or opposed by the parents or through education, they will result in intelligence and creative abilities above average. He suggests that from these the real dyslexic gift can arise – the gift of gaining superior skills in some area (s. 18-20).

Holistic thinking

A person with dyslexia to a large extent has a holistic thinking, which they are dependent on more than most people. You have your attention and awareness shattered in many different directions in the surroundings and take in information in a holistic way. This is reflected in reading, as well, where a word is seen much like for instance a tree. You do not start by seeing only the leaves on the left, then move on to the branches and after that the trunk and lastly the leaves on the right. You take in the tree as a whole, just as dyslexics do with words when reading. This means that it is easy to misread a word that is similar to another word and that, to an extent, reading depends on guesswork. The previous description is of a reading technique that is usually fast and which you normally use after symbols and language sounds have been automated. The difference, as I interpret Davis, is that as a dyslexic you use almost only this technique and that you jump ahead to it right at the beginning. This is discussed more thoroughly in "*Dyslexia according to me*". In a reading situation we need to have the ability to limit our awareness, which the holistic seeing to some extent works against (Davis,1999, p. 38). The holistic seeing also affects the direction in which you read. To start the decoding from left to right is something that has to be learnt. The guesswork in reading can in turn mean that a necessary feeling of security in reading is not attained and that your confidence in the area is affected (p.189-190). If the automatic word decoding ability has not been fully developed it is difficult to trust your reading ability. These difficulties are easily recognizable when the person reads out loud. (Swedish Research Council, 2006).

The three-dimensional thinking also has an impact on the reading situation. Words are two-dimensional but as a dyslexic it is normal to see the words in three dimensions. This is described as though they are floating around in space, (Davis, 1999, p. 48) especially on white paper. You can see the words from several directions, something that actually applies to everything. For instance, the clock can for some appear to be interpreted from several directions and it can be necessary to make it flat in the thought world in order for it to be clear from which direction it should be read. With this three-dimensional image-thinking one is so free to move between different angles that there is no above, in, front or back. Everything depends on the angle from which you choose to look (Hellberg, 2002, p. 25-27).

Hellberg (p. 8) describes how, if as a dyslexic you are not allowed to develop your image-seeing, this leads to dyslexic symptoms. The degree of dyslexic symptoms is determined by the environment, and every time a new subject needs be learned (and you are unable to take advantage of this three-dimensional seeing) it takes time.

Music - dyslexia (the impact of dyslexia on music making)

Music and the brain

There is no specific music centre in the brain. Both hemispheres are used and are of importance for music making. (Fagius, 2001, p. 61). It is however possible to say that the right hemisphere is responsible for the basic musical ability. This is where the ability to understand melodies, pitch, timbre and the musical structure in its process and entirety is located (p. 89). Aural skills and improvisation are also analyzed and processed in the right hemisphere (O. Persson, 1990-91). The left hemisphere gets more and more involved the more educated one gets. Details and linguistic competence are added and take over as the musical analysis gets more sophisticated, with for instance notes and concepts (Fagius, p. 94). O.Persson claims that tablature reading also belongs to the left hemisphere's area of work (O. Persson, 1990-91). When we sing the left hemisphere is mainly responsible for the text and the right hemisphere for the melody, which is reflected in speech as well, as the prosody or speech melody is handled by the right hemisphere. (Fagius, 2001, p.103). From studies on people with musical education as well as people without such education it has also been concluded that musical education transforms music listening from a right-hemisphere-activity to a something that concerns the left hemisphere (O. Persson, 1990-91).

Music learning

Here follows a summary of how music learning, memory and memorization "normally" happen, to be able to draw parallels to dyslexia. According to Lilliestam (1995) music learning stems from four ways of memorizing music. The auditory memory registers how a song or musical movement sounds, while the visual memory is built on how something looks, such as the white and black keys on a piano, the guitar's chord grips or scales. Then there is the kinesthetic (motor) memory and the tactile (touch) memory. According to Andersson these make us able to remember how something feels when it is played or sung (2004, p. 45). There is also the verbal memory which makes us able to remember things through verbal concepts that have to do with music theory. Anderson suggests that different concepts are used depending on the prior knowledge of music theory (Andersson, 2004, s. 48).

A learning process through notes is described in the following way:

> To learn to read notes involves first a period of practicing over and over. During this period the notes need to be decoded manually, at first through reading and understanding only one note at a time. You learn to associate a certain written note with a sound from the instrument /…/ As time passes the process becomes gradually more automated. Two main things contribute to this at the same time:
>
> One is that you start to see the parts of the note-picture as parts of a larger group. That is, you perceive groups of notes and other symbols as units (rather than reading them one by one). This increases the reading speed a lot in the same way that it increases for someone who gradually learns to read normal text as whole words or groups of words rather than individual letters.
>
> The other is that the associations become automated. This goes for associations between a certain written symbol and a certain meaning ("Oh right, that note is called C…") as well as associations between a note in a certain position in a note system and a certain sound from the instrument. ("…and that means I should press there/it should sound like that"). Thanks to this automation you no longer need to consciously translate a written note to a certain grip or for instance an articulation mark to a certain execution. (Svensson, 2005, p. 13-14).

Note reading

"If all a child can see are difficulties in symbolic notation the other aspects of music will be lost. Notation is there to aid us not as barrier to expression."(Miles & Westcombe, p. 51) A lot of children with dyslexia are very motivated at the beginning of their musical education and the first year usually goes well, but then some of them stop wanting to practice or attend lessons. This is something that confuses the adults involved (Brand, chap 3, Miles & Westcombe, p. 19). If a student who is musically gifted and motivated is not learning at the speed that the teacher would predict dyslexia might be the cause (Carver).

Jacob and Philip are two examples of the problems of note reading connected to dyslexia. Jacob is 11 years old and loves music, both playing and creating. But when notes entered the picture his love for music changed. Jacob describes notes as a kind of foreign coded language that he does not understand. He tries to interpret it but the music refuses to "jump out". He describes it as though he knows that it is there but for some reason he cannot find it. His mother helps him at home but he describes how he feels like a snail participating in the London Marathon. He is miserable and all he wants is to create and play music (Miles & Westcombe, 2001, p. 51).

Philip, who is now 75 years old, was a musical wonder child, according to Miles. He played a lot of instruments and was tuning pianos by the age of 7. He quickly made a career in his youth but the further he got, the greater became the requirements on his ability to read notes. In the end he was unable to keep making a living as a musician because of his inadequate abilities to read notes and started to tune pianos full time instead (Miles & Westcombe, 2001 p. 59). The same way he mixed up the numbers in a phone-number, he would get the last notes or the note values of a bar mixed up. He also seemed to have dyscalculic problems. Just as the written symbols in words hinder his reading, so do the written symbols in music slow down his process.

According to several sources (Jensen, 2000) having dyslexia can lead to difficulties in learning notes (http://www.stockholmsdyslexicentrum.se/signaler-dyslexi.htm) (Jonsson

1995). If a person with dyslexia has difficulties with text she will probably experience problems with notes as well, even if she has good aural skills and a good sense of melodies and harmonies (www.resourceroom.net/gtld/ida_music.asp). As a professional musician you cannot get past the note reading (Oglethorpe, 1996, chap 5 -6).

Barbro Johansson, professor of neurology, suggests that one difference between language and music is the temporal aspect; the processes have different time resolutions. Her guess is that this could lead to problems in note reading, but not as grave as the ones in language.

> To be able to analyze and interpret sounds in language one needs a time resolution of no more than 20 milliseconds (ms), in music it is often enough with 100-150 ms. If you play a melody too fast it is very hard to hear what melody it is. On the other hand the pitch is of course more important in music. Even if there are tonal languages, i.e. languages where the meaning of a word is affected by its pitch, everything in language is still more relative and the absolute pitch less important than the relationships between different pitches.
> (Johansson, Personal communication-06)

Weiglesworth suggests the opposite, however, that it should be harder to learn to read ordinary text as the notes are put in relation to the practice of playing (Wriglesworth, 2005). The main problems according to Brand, are note reading and sight reading[1]. This can cause difficulties especially during examinations and when playing in an orchestra on a professional level. She states that this can be especially difficult when singing as both notes and text might need to be read at the same time. Other factors that might cause problems in the area are words that have been borrowed from other languages and verbal instructions having to do with for instance right and left (Brand, www.resourceroom.net/gtld/ida_music.asp).

Wriglesworth writes that you, as a dyslexic, also have a certain tendency to skip notes, phrases and drills when reading. That the eye-movements can cause you to decode and play backwards and for instance interpret the nuance signs in the wrong direction so that it takes on the opposite meaning. She suggests that the visual perception is difficult and that it is normal to read the notes on for instance the line below (Wriglesworth, 2005). Another difficulty that most dyslexics experience is with connecting symbols to their names (Miles & Westcombe, p. 63).

Several people describe how they use their own individual symbols and images instead, to remember articulation, expression and ornament (Miles & Westcombe, chap. 10). One musician describes how he feels as though looking at the notes does not tell him anything (Miles & Westcombe, p.19). There is not enough time to decode all the information in the form of pitch and note value. Transposition and reading different clefs is also seen as complicated (p. 53). Dots and lines can also complicate things according to the flutist Caroline Oldfield, just as finding the time to include the accidentals (p. 27). That the denominations used are taken from the alphabet, the first seven letters, can also cause problems, especially when their positions in the system vary depending on the clef (p. 19). The problems arise from the fact that the note reading is not automated and that you might need to work out what note it is, counting upwards from C (Miles & Westcombe, p. 50). The person in question feels that the highest note lines are the easiest and that sight reading works when the pace is slow but fails to work for fast passages (Miles & Westcombe, p. 51). It is

[1] Playing directly from notes, without prior understanding. "Raw" note reading. You read and play at the same time without having prior knowledge of the piece. A situation where you are particularly dependent on your note-reading ability.

described as easier to choose a "one-system-instrument" which plays one note at a time – if you are going to read notes. The piano for instance, is more difficult (Miles & Westcombe, p. 27, 23). It can also be an advantage to have played an instrument that is noted in the bass clef before playing the piano, as it gives you an opportunity to practice note reading in the bass clef (Miles & Westcombe, p. 19).

As a dyslexic you need the teacher to be understanding. "If they only knew how much effort it takes, that half a page is an accomplishment. That it is pure joy to get through a whole piece" writes one of the people in the book (Miles & Westcombe, p. 28). This is also seen as frustrating, which is not that strange when you have to put at least twice as much time and a lot of effort into it (Miles & Westcombe, p. 54).

Janet Coker writes that she is not allowed to start singing until she has struggled through the notes. This makes her angry, that others understand but she does not. She has become friends with books and wished she could become friends with notes as well (Miles & Westcombe, s. 37). Is it perceived as difficult to alternate between looking at the notes and the conductor, to find your way back in the notes again. For this it is recommended to mark certain important places among the notes with color (Miles & Westcombe, s. 20, 51). It could however be argued that a person with dyslexia always will be a slower sight reader, despite of tricks (Miles & Westcombe, p. 19). Using rhymes and jingles is a good trick, but only when the music is played one note at a time. (Miles & Westcombe, p. 27). Hellberg describes how: "the rhyme knows the note-names and I know the rhyme" (Hellberg 2002, s.21).

Aural skills

"*Gehör*" (aural skills), from the German for hearing, means "the ability to correctly perceive a certain musical structure (a melody, a rhythmic pattern, a series of chords etcetera), using only you ears. And to be able to use this in a concrete manner." (Sohlmans lexikon 1977, p. 83). In other words, you should be able to reproduce the music you hear through song or through playing an instrument. The difference between reading notes and playing by ear, according to Andersson, is to be found in the learning approach: "the note-reading singers use real listening i.e. listening that they themselves achieve in order to fortify the character of the song. Those who sing by ear organize what they hear to find systems and structures in the composition." (Andersson, 2004)

If you look at dyslexia it is clear that playing by ear will not be a problem (www.dyslexicentrum.se). For a person with dyslexia improvisation and playing from memory are two methods of greater importance (Carver). To improvise and play by ear is described as the most fun part of the music (Miles & Westcombe, p. 40). Aural skills are used a lot among these musicians. Strong aural skills are used to be able to recreate and memorize exactly (Miles & Westcombe, p. 67). One person states that she is unable to play by ear because of her slow note-reading (Miles & Westcombe, p. 55).

More

Making your own music also seems to be common among dyslexics, according to the literature. As a dyslexic you formulate your own theories music theories and become your own teacher (Miles & Westcombe, p. 53). You experiment with your own methods and look

at and are inspired by other people's technique and sound (Miles & Westcombe, p. 54). It is important to know how to learn the music and achieve professional goals. In which way this is done is not important (Miles & Westcombe, p. 23).

Miles also describes the interviewees' thoughts concerning self-esteem and self-confidence in his book. People with dyslexia talk about being afraid of making mistakes (Miles & Westcombe, 2001, p. 63), and that it takes courage to reveal yourself as a dyslexic (Miles & Westcombe, 2001, p. 23). For instance, a student in the book who had gone to a college of music did not wish to talk about his/her problems there (Miles & Westcombe, 2001, p. 23). Another person now realizes how much she has missed during her education. This because she has been reluctant to ask questions when she did not understand as she did not want to slow down the class. She describes how she should have asked and explained this to the teacher and asked for explanations (Miles & Westcombe, 2001, p. 55).

One person talks about feeling that the dyslexia contributes to his ability to see possibilities and ideas from different angles. He says that this for instance helps him see what needs to be developed further and in what way a problem can be solved. He sees this ability as useful when composing as well (Miles & Westcombe, p. 35- 36).

When it comes to lyrics, learning text is difficult according to Miles and Westcombe. One person mentions that she does however know lyrics from her childhood. She thinks this is because they are so closely connected to images. She sees them like a movie in her head (Miles & Westcombe, p. 51). In choir song singing lyrics is easier if the leader mimes. Within choir song it is often seen as difficult to have time to read both text and notes at the same time, text in a foreign language can also complicate things (Miles & Westcombe, p. 20). Incidentally the normal reading went better for the children who were part of a choir, as this helped them separate syllables (Miles & Westcombe, p. 63).

When it comes to spatial terms, difficulties can cause fingering charts to be turned the wrong way, as for instance the flute is horizontal while its fingering charts are vertical. The same problem arises with the piano as concepts like high and low notes are used about a horizontal keyboard. Which direction is indicated, left or right, gets mixed up. In these situations it can help to show through gestures instead of using the concepts of right and left (Miles & Westcombe, p. 19). Here there is also a story about a six year old who often switched hands (Miles & Westcombe, 2001, p. 27). The same problem is brought up in an article by Carver. When the fingers on a cello move towards the floor the pitch rises. The violin works in a similar way, as one moves away from the face (Carver). The problem of organizing what is learnt is also brought up, the ability to remember a certain order for instance (Miles & Westcombe, 2001, p. 23).

Problems with motor skills have nothing to do with dyslexia. Rather the opposite, dyslexics tend to have a very developed kinesthetic "body memory" that should be used in these situations. This is something that should be used more in music, to make things easier in general and particularly for people with dyslexia. However, this kind of memory is often ignored (Oglethorpe, 1996, chap 5-6).

Dyslexia is common among musicians and their families (Miles & Westcombe, 2001, chap. 6).

Dyslexia according to me: personal reflections on dyslexia

”I am unable to think flatly”

In my opinion a narrow description of dyslexia is used in definitions of dyslexia as well as in research on the subject. A relatively limited picture is presented with only the problems of dyslexia in focus. However, dyslexia is a ”condition” that encompasses so much more, something that is seldom shown in the above mentioned definitions. I would argue that they are trying to find what is “wrong” by focusing on the problems without looking outside and without a more holistic perspective. The problems described when dyslexia is treated are a natural result of the way dyslexics think and “work”. As a matter of fact there are also advantages that are never brought up and that research has not focused on at all. (Read more in the background: *What is dyslexia?*). I would therefore like to make an attempt at presenting the whole picture of what dyslexia is really about, my whole picture.

People with dyslexia have a larger right hemisphere (Kere & Finer, 2008), which to a larger degree is involved in thinking. Because I am aware that it can be difficult to understand and realize what this could entail, I would like to complement the text with my own experiences, theories and thoughts. Partly because I want to share my experiences in hopes of making the issue even more concrete and increase the understanding of what the issue could really be. And partly because I could be seen as a source myself, who in some way might complement the discussions on the subject.

Something that is very important to bear in mind is that all dyslexics are different and that dyslexia can be manifested in a variety of ways. No dyslexic is quite like another, people have different strategies, different strengths and weaknesses. What I will now share and claim can therefore not be seen as general experiences or guidelines, they are my thoughts and opinions, from my perspective. Because my insight into the “non-dyslexic perspective” is limited (as well as my insight into the dyslexic, as just mentioned) I reserve myself for some faulty assumptions. The only thing I really know is how I think and how I look at text, not how others do. This is why I, in this part, will try to explain just that and describe how I experience it.

Three-dimensionality and the whole picture

Davis (1999) emphasizes the multidimensional thinking that dyslexics in many ways have and claims that it appears much like a multisensory movie. When I imagine what he might mean my image does undoubtedly become three-dimensional. I also see how a lot of the phenomena that he describes can stem from this kind of thinking. Hellberg also discusses three-

dimensional thinking and several aspects of such thinking. Like Hellberg I am convinced that one, as a dyslexic, has a multidimensional, three-dimensional image-thinking as ones main approach or tool of interpretation. This seems correct both when you look at the problems one can experience as well as in those situations where this kind of thinking can be an advantage.

There are both advantages and disadvantages of the verbal and non-verbal thinking, depending on the situation and task at hand. To my mind it is however not strange to imagine that the three-dimensional non-verbal image-thinking could cause complications in situations with two-dimensional information; when it comes to things that need to be handled two-dimensionally and that require two-dimensional decoding to achieve the best results. It is also, as far as I can tell, within these two dimensional areas that "dyslexia" often presents as a problem.

Dyslexia is the result of a mainly non-verbal way of thinking, thinking that to a large degree consists of three-dimensional images. One could speculate on whether this three-dimensionality is connected in any way to the symmetry that exists in the dyslexic brain, if I can put it that way. There is no significant dominance when it comes to the eyes and not to the same degree as "normal" when it comes to the hands (if one is right or left-handed) either. There are also theories that this might extend to hearing, with dominant ears and so on. Could this equality be a reason for the dimension that has been added to the thinking? Could this be related to the perceived three-dimensionality that results in an inability to think "flatly"?

Text, notes and some kinds of formulas are the only things I can think of that are two-dimensional and also require two-dimensional decoding. Paintings, maps and movie screens are for instance also flat or two-dimensional, but do not require decoding of this kind to the same extent. This information can be decoded three-dimensionally as well, without any essential content being damaged. If one decodes for instance text in a three-dimensional manner, however, it can cause complications for reading, both for the way that one sees the text in its entirety but also for individual words. It is also possible to feel that one gets another kind of information out of reading that is neither necessary nor intended.

I sometimes catch myself looking at texts, for instance words in signs and posters, without automatically having read them, something I believe would be considered rare. However, I often know the approximate name of the café or whatever the sign is about, and the look of the word or some of the letters in it. I also know how the name looks as an image: stile, color and font, if it looks like another logo from another context and the "feel" of the word. All the other information imaginable, but not necessarily what it actually and literally says. I often have to "turn on" that function consciously.

My reading process

I would argue that there are several elements to the consequences of reading texts with a three-dimensional kind of decoding. The phenomenon of jumping letters and words that will not stand still is quite often brought up when reading is described in the context of dyslexia. This is connected to the three-dimensional thinking and decoding and is a consequence that appears in practice. To try to make this a bit easier to understand for "normal people" I will now explain how I experience this phenomenon.

When I look at a text I can indeed sometimes experience it as though the text is not entirely still. I tend to draw a parallel to when one looks at a certain kind of three-dimensional picture, the kind that at first sight seems to consist only of small patterns from which you cannot interpret any larger pattern or image. But if you look at it for a while in the end something will appear at the centre of this picture. When this happens the surroundings of this ”object” that appears look like they are shaking, a bit like the random dot patterns on the TV when there is no transmission. I recognize this movement or shaking from my reading and above all from when I look at a text.

I can recognize from my own reading experience the depth that you feel you experience in the three-dimensional picture described above. The white background can seem to want to switch places with the letters’ clear black silhouettes. The background can seem to be moving forward towards me and sometimes want to place itself in front of the letters, as if they were cut out of the paper. The letters can therefore appear to be moving, not so much in different directions, in my case, but rather forwards and backwards. As if there was indeed some kind of depth in the picture or, as I try to read and interpret it, the text. Hellberg (2002, p. 25) describes how she experiences text on white paper as floating in the air. She also raises the issue of sometimes reversing the letters (something I do not experience myself in my writing, however) as a result of the lack of fixed directions such as up and down, forward and backward in three-dimensional thought. You are completely free to see the letter from all angles.

The text is flat, two-dimensional and should be interpreted as such. So when I add an extra dimension it comes to life. It literally gains a deeper dimension that is neither helpful nor of any use in this context, but rather hinders the ability to see the words clearly. There is nothing to gain from interpreting for instance a text as a whole or as a picture. Almost no information can be extracted through using this “eye” when reading regular texts, more than perhaps the relationship between the headline and the text mass and indents when there is a new line to indicate a new paragraph which might point to a change of subject of some kind.

I can also sometimes experience this depth or way of seeing in the relationship between different parts of a text, between words but also between letters. If the words are moving and seem to be in different layers, with different distances between them, it is also harder to see them beside each other, which is probably noticeable in my eye-movements and their “points of fixation” in the text. It has also been observed that the eye-movement when reading and the eyes’ points of fixation in the text differ between dyslexics and “normal” readers (Persson, 2002). It becomes more difficult for dyslexics to understand the context in sentences where the words do not appear to be side by side.

The same thing can probably apply to the letters in the words. Here too, every word can have a depth and all parts of the word might not be as accessible at the same time. Some letters could be perceived as further back which might mean that they become difficult to read. A similar situation happens “in thought”. Inger Rabeus (lecture in Gothenburg, 2006) and Hellberg (2002) talk about how, as a dyslexic you do not see the words in your thinking to the same extent, you do not see the “cheat sheet”. You have a different ability to see symbols of that kind in your mind, something that is also brought up by Davis (1999, p. 70) and Hellberg (2002 p. 8). The letters also tend not to keep still by each others’ sides. Words are flat phenomena. I am however able to easily bring forth one letter at a time with three-dimensional form in my mind.

I and several people I know who have dyslexia often and relatively easily draw ”shadows” on letters and text, often subconsciously. The three-dimensional seeing could also affect your perspective when drawing. It could be advantageous in this area and facilitate drawing and creation of a three-dimensional kind.

The three-dimensional thinking can, for the same reason, make the interpretation of other flat phenomena such as time, harder. Hellberg describes how one might need to make a flat image in one’s mind of the watch, so that the direction from which it should be seen, concepts such as front, back, in and over, become more clear. This problem and need is not something I recognize myself, but the example once again makes the three-dimensional thinking and the problems it can cause with flat information concrete.

When problems concerning reading direction and automatic decoding are discussed, as for instance in the definitions I have presented, as well as in a paper by Persson (2002), I would argue that the explanation lies in the three-dimensional as well. Davis (1999, p. 190) describes how reading direction is something that has to be learnt. To interpret text in this unnatural way, as you do as a dyslexic, is very taxing. You have to consciously force the eyes to go in the “correct” direction. This is something that I experience and it takes a lot of energy and is exhausting. With the three-dimensional seeing and thinking you have a lot more difficulties at first with decoding only small units or details, such as decoding a text letter by letter or word by word, in a fixed order, one beside the other, from left to right. You naturally decode everything in its entirety at once. You want to start with the whole and then move downwards to the details in your structuring.

I believe that using the analytical principle as a reading method, which Frost (2002) describes, could be advantageous when learning to read with dyslexia. With this method you start with the whole which is then processed at a more detailed level. One such method is “Whole language” which originated in New Zeeland and is based on the child’s experience world. To learn to read is then perceived as a natural linguistic process, according to Frost. The contrasting reading method, which is the most common in our schools in Sweden, originated from another principle, the synthetic principle. Helena Bovin (personal communication, 2007) works as a singer, voice and speech therapist, as well with listening therapy using the Tomatis method (www.tomatis.se). She states that the synthetic principle means that the child starts by learning a group of “sub-abilities” that are then integrated to a contingent reading process. The reading tradition used here is Phonics, which is based on teaching the children the alphabetic principle; letters, their sounds and how to work with analysis and synthesis. An automated ability to decode words is here a prerequisite for good reading abilities (Frost 2002).

There are a lot of contradictory statements on this reading method from New Zeeland. It has been stated for instance that problems with dyslexia do not exist on New Zeeland as this method fits the “dyslexic” way of thinking. According to B. Sohlman (2000, p. 76), however, difficulties with reading and writing do exist there. I believe that both these views could be correct, but perhaps the people who develop problems there are not the dyslexics. Perhaps it is rather those who are extremely “left hemisphere-dominated” in their thinking that have trouble with this holistic approach.

I learned to read through a synthetic method myself. We learned the names of the letters and "sounded" our way to the words. I strongly suspect, however, that I jumped straight to reading the whole words, which the guesswork and many misreadings of small words I did as a child indicate. This phenomenon of reading whole words is also brought up by Davis (1999, p. 189) as something that is common for dyslexics. This could also explain why I had a hard time understanding the rules of pronunciation in for instance English and phonetic writing.

As a good reader Høien and Lundberg (2002 a.a.) claim that one should be able to switch between "whole-word reading" and "sound reading" or "phonologic" and "orthographic reading" as they call it. They suggest that dyslexics are unable to switch naturally between these both strategies and instead get stuck in one (Tjernberg, 2006).

The difference between the orthographic, automated "whole-word reading" which is the last and fourth level of the traditional reading process (Asmervik, Ogden & Rygvold. 1999, p. 28-29; Vetenskapsrådet/The Swedish Research Council, 2006, p.18-19), and my "whole-word reading" is that my reading is not rooted to the same extent in an automated sounding base. Non-dyslexics are quickly able to switch to previous stages such as the alphabet-phonological reading that uses sounding as a tool, when they for instance encounter an unknown word. I am not able to alternate between these different strategies as easily.

As a dyslexic you are however able to use and take advantage of the holistic perspective, something I do. I can extract a lot of other information from texts that I am reading, beyond the content. This is something I use a lot when I write texts to or for myself. Symbols of another kind, with a more direct meaning, such as arrows and images, distances, size, font, sometimes even color, all in order to include as much information as possible that does not have to be read, but also to facilitate the reading and make the text mass as small as possible. This is information that I gain directly from the text, just by looking at it, without having to read it. These ways of marking and making words stick out from the surroundings are what makes me able to quickly extract information from a text simply by glancing at it. Sometimes it is suggested by for instance Lindeborg (2005), that marking text can make it harder to read, something that is not true in my case. This holistic kind of visual communication would definitely be good to use more than we generally do today.

Symbol – image

I would suggest that the fact that the reading speed can be slower for dyslexics can be explained both by the way of interpreting the text as well as by the limited ability to think through indirect symbols such as letters. If you do not have the same ability to think in words and to see them before your mind's eye this can contribute to being limited in your thinking around information that is based on words. This could be an explanation to the claim that the verbal work-memory in this respect could be affected and debilitated as for instance Andersson, Belfrage and Sjölund suggest (2006). I would like to clarify that a lot indicates that it is only this function, the "symbol processing" of words/indirect symbols which is affected in this respect. This can also explain possible difficulties with spelling, with learning new words and with other information built on this. As Rabeus (2006) suggests: one does not

see the cheat sheet. Learning difficulties is another concept that is brought up in connection to dyslexia, and for which I would suggest the same explanation is appropriate. In school a great deal of the information and learning is built on the "literary system" as I call it, the ability to memorize words and word chains. If you have a limited ability to see words in your mind this will of course affect your learning and memorization of that kind of information.

This also explains the problems that might arise with understanding of certain kinds of oral instructions. If these are constructed in a literary manner, where the ability to see certain kinds of information quickly in your mind in order to aid memory and facilitate understanding, is expected, it is not that strange if you as an "image-thinker" can have trouble. It can be difficult to find the time to create images of what is being said if the information for instance involves unknown names or words, a lot of numbers or an instruction. I believe that I myself often subconsciously use my aural skills in these situations. I am able to repeat what was said in my mind if I was not able to understand the content the first time. As a dyslexic one has to rely on images, as Davis (1999, p. 23) and Hellberg (2002, p.8) also claim. Normally a person uses their inner "words-seeing" to achieve understanding when reading, but for a dyslexic this is not possible to the same extent. Davis claims that this kind of thinking is faster. In this case, however, I suspect that the translation process, building meaning in images, is more time consuming because of the different formats. In handling a text this process is a little more complicated than the other. There are more steps involved for a person who thinks mainly in images. First you need to interpret the text in a certain way and in a certain order, i.e. the reading direction. Then the symbols that together form words and sentences need to be re-interpreted from a language of symbols to a language of images before the understanding is achieved. To understand the meaning through images a great deal of information is needed. This so that it is possible for a basis of images, something to build on, to be formed. This basis in turn is necessary for understanding. As a dyslexic you want to have a whole, a basis, to be able to then build on. This also means that the difficulties of understanding texts can vary greatly. It is easier to build an image-understanding around a more descriptive text than a very abstract one. If you already have a bit background knowledge about the content of the text you need to understand this also facilitates the process, as part of the work might already have been done. You might have created an image already that you just have to build on instead of having to construct entirely new images while reading.

The image-thinking has a varying effect on the ability to understand what is read, however. For some kinds of text containing a lot of theoretic information, abstractions and facts it can be difficult to quickly attain a figurative understanding. This is particularly true if you only have images to tie the information to, which is true of dyslexics to a greater extent than most. When for instance it comes to descriptive texts such as fictional work, I believe that thinking in images can be an asset and enrich the understanding. You quickly understand the plot and the reading experience widens. I myself often experience it almost as though I am in the environment that I am reading about. The experience is probably also enriched by the fact that I spend quite a lot of time in this environment, as it takes me a while to read a book. I very much enjoy reading historical novels for instance, which is something that I believe is partly a result of this. It gives you the opportunity of stepping in to another time, another world, on your own terms and initiative.

It is when reading becomes a means of communication, learning and gaining information that it becomes a problem for me. Especially when this process is limited by time. It is not the reading in itself that causes problems as much as my pace.

Spatial perception

The three-dimensional image-thinking also affects your perception of space to a degree, something that Davis also brings up. You are more free in your thinking and more attentive to your environment as a whole, which is also reflected in this area. Besides the fact that I always know where I am in a text and what shape the text has, I also notice it in contexts where it might be necessary to imagine how things look from other perspectives and angles. This is something I have always seen as relatively easy and something that I feel is of great use to me. I also tend to notice it when talking about cardinal directions although when the concepts of left and right are brought up I sometimes get slightly confused. This confusion has nothing to do with spatial perception in general but only appears when concepts of a more two-dimensional kind are brought up. These concepts depend on which perspective you choose to use, if it is from your perspective that the space is viewed and in that case where you imagine that you are located in space. I often imagine a room from far above.

Creativity

I have started to notice the creativity of people with image-thinking/dyslexia more and more. Creativity has always been such a big part of my background that I almost took it for granted and saw it as natural until I noticed that not all families were like that. Creating, painting, crafting and fixing, activities that my mother was largely responsible for, were always a natural part of my childhood. Other dyslexics that I have spoken with have felt the same way about the prevalence of these activities in homes in general, which is also described in Hellberg (2002, p.9). These days I almost see creativity, idea generation and inventiveness as the main things that connect dyslexics rather than their difficulties with reading and writing, which differ so much from person to person. The ability often takes on different forms but is characterized by creation in different ways in theory or practice. Inventiveness is a character trait that is useful when it appears that what you are looking for has not yet been invented. For me it is often the process that matters and where you get satisfaction, rather than the result.

To phrase it slightly like a cliché you could say that I feel most alive when I am creating. Perhaps this is because you are allowed to be yourself and work in a way that suits you in this situation, unlike other situations that I have mentioned. And so maybe it is no coincidence that you try to find new ways to walk home (just to see new places to be inspired by) or to do things free-hand without recipes, patterns models or notes. The same principle applies for figuring out new teaching materials or ways of teaching, creative elements that I am very glad that my job as a music teacher includes. The curiosity and joy in my own creating process is something I believe I partly owe to my “dyslexic” way of thinking.

I once listened to a radio program in which they were discussing the value of creativity in today’s workplaces; its role in helping companies survive and in caring for peoples’ well-being. Jenny Åkerman, an instructor in brain-training, talked about a number of different exercises that you could do to train your creativity. It was when I heard these exercises that I started to reflect on this, as it felt so natural to me. Among other things she talked about widening your thinking by doing normal things in a new way, about getting used to being

confused and about playing games which created new associations and thoughts. I cannot imagine that any of these things seem foreign to a person with dyslexia, even without the exercises. (Radio P1, Kropp och själ/Body and soul), 8/7- 08). On the web page of Språka loss you can read “It is a challenge for a society that is built around written communication to such an extent as ours, to discover and use these sides” (www.sprakaloss.se/index.htm)

Johan Kullberg, professor of psychology, describes creativity as a way of approaching life. He claims that it is a question of the ability to listen inwards, but also a question of courage (Radio P1, Kropp och själ (Body and soul), 8/7- 08).

Speaking of courage it is also important to mention the great enemy and sadly often companion of the image-thinker: the lack of self-confidence that was easily developed in school but which is unfortunately a lot harder to get rid of. It is common to mention a lack of self-confidence as a result of dyslexia; examples are mentioned in Davis (1999), Miles and Westcombe (2001), Hellberg (2002) and the web page of Språka loss etcetera. On the latter the fact that dyslexia can make you avoid certain situations, in order to avoid humiliation is also mentioned.

If however, you get the right support and manage to get past this obstacle I believe that you can then dare to enter the creative process in the work market which, according to for instance the program “Kropp och själ” on P1, seems to crave this kind of competence. It is said that a great deal of inventors, executives and leaders have dyslexia (or rather an image-thinking where the right hemisphere influences thinking to a large degree). Ingvar Kamprad is a typical innovator with a concept that worked out pretty well, as was Bell and Einstein (for further information see the list at the beginning of this thesis). It is also said that ten percent of all the millionaires in the world have this handicap, or gift, however you wish to see it.

This image-thinking, as presented above, makes me and many others with me ”image-thinkers”, a name that I see as more appropriate and that gives a more fair and explicatory idea of what the issue is all about. You are an image-thinker, which in turn can naturally result in for instance difficulties with words, dyslexia. I will continue to use the terms dyslexia and dyslexic in order to prevent possible confusion. I would however like this reasoning to be kept in mind as the rest of the thesis is read.

I would like to finish with Hellberg’s appeal (p. 56):
”Do not forget what incredible joy ‘image-seeing’ can bring, so unleash your imagination.”

My definition of dyslexia:

”Dyslexia is a natural consequence and a result of a kind of thinking, a mainly non-verbal, three-dimensional image-thinking. This brings with it the inability to think flatly. The only things that are two-dimensional in our society and that also require two-dimensional decoding and processing are text, notes and similar things. It is within these areas that problems with dyslexia arise, which can often be traced back to the translation process that these different formats require.”

Problem description and purpose

Music and dyslexia are two very different areas. For me it is important, exciting and interesting to see the two meet. The purpose of this thesis is to try to clarify the interaction of these two areas and see what practical consequences it might have - if dyslexia could have advantages or disadvantages, or both, when one makes music and in a music-pedagogical situation.

I therefore want to:

Examine the consequences of dyslexia in musical and music-pedagogical contexts.

In executing this I want to increase the knowledge of the practical circumstances related to dyslexia, present the whole picture and describe what the issue is really about, in relation to music. If you understand and see the whole picture it is easier to come to conclusions and see how different contexts relate to each other yourself.

I want to present how you, as a musician or student of music with dyslexia might experience our music teaching.

It is my purpose to, in this thesis, try to provide an idea and possible explanation of this connection. To show how this relationship might work and feel in different musical situations, both on a “scientific” and on a personal (experienced) basis.

I wish to explain and reduce the prejudice by increasing the understanding and knowledge around this subject. I wish to warn against making the mistakes that you as a pedagogue can make in connection to students with dyslexia. I wish to underline potential dangerous pitfalls and problems, what you should be attentive to and aware of, and what you might need to avoid. I naturally also want to show the opportunities and probable strong abilities and capacities that can be worked on, emphasized and used as a basis in a teaching situation. All to minimize the risk of misunderstandings and negative effects on the student’s music making and interest.

Method

My main method has been half structured interviews. The selection consists of people with an interest in music and experience of music education as well as of dyslexia.

Gender and age are variables of lesser importance, beyond the fact that a certain range is desirable. I also wanted a variation regarding the instruments, genres, levels and occupations, to be able to see if the results could be distinguished depending on the musical areas or if some general rule could be indicated.

I chose to use interviews rather than a survey in order to be able to discuss the subjects more widely, ask follow-up-questions and ask the informant to expand on what s/he was saying if I thought it was necessary. That I was able to develop a personal relationship with the informant in question and able to mention my own experiences and exchange thoughts on the subjects was something I realized might be of interest after the interview. An interview could also be a way of making it easier for the informant in these cases. Using surveys is a method that in this situation could have caused problems or come with a risk, as the flow of information could have been restricted or affected negatively, which I wanted to avoid as far as possible.

The method I used to get in touch with the interviewees was mainly to e-mail a request to all students at the Royal College of Music in Stockholm. I was also given tips by people in my surroundings about people who might suit the purpose outside of the college as well, which made me able to contact them. As it happens people also contacted me after hearing or seeing information about my work. There was for instance a note in the Berwald hall which resulted in one of the informants contacting me. I also contacted people who were in the music business outside of the school through e-mail. Dyslexia, and in particular in relation to music, can unfortunately still be perceived as a rather sensitive area, which made this work rather sensitive in some cases. Some of the working musicians and teachers that I contacted keep this a secret, which I believe could have contributed to the fact that they did not want or dare be a part of the work.

The interviews took place in a room at the Royal College of Music in Stockholm, at a café or similar in Stockholm and Uppsala, or at the home of the informant. I let the interviewees decide this. The conversation usually lasted between one and two hours and was recorded.

There are nine interviews in total.
The people who were interviewed are students at the Royal College of Music in Stockholm, staff at the Royal College of Music in Stockholm and working musicians at both a professional and amateur level.

1. Student at the Royal College of Music in Stockholm, studying to be a music teacher.
2. Student at the Royal College of Music in Stockholm, musician with diplomat education, pedagogical education
3. Student at the Royal College of Music in Stockholm, studying to be a music teacher.

4. Amateur musician, who mainly played when younger at Kommunala Musikskolan (the Communal School of Music).
5. Methodology teacher, instrument teacher and adjunct professor at the Royal College of Music in Stockholm.
6. Musician, composer and part time teacher. Mainly a pianist.
7. Staff and amateur musician at the Royal College of Music in Stockholm.
8. Musician, mainly within the Jazz genre. Trumpet as main instrument.
9. Student at the Royal College of Music in Stockholm, studying to be a church musician, cantor and organist.

To start off the interviews I asked the informants to give a short presentation of themselves; their main instrument, their musical background as well as their problems with dyslexia. The latter to be able to draw parallels or come to other kinds of conclusions.

I chose not to control the conversation too much during the interviews so as not to interrupt the reasoning of the informants and risk missing important information. Another hope I had was that by letting the conversation proceed in part in a natural manner the informant would feel comfortable and free in his/her reasoning. This resulted in a variation in the order, and sometimes the content as well, of the interviews. The content was naturally also affected by the experience and musical level of the informant. At the end of this thesis I will present the interviews in their entirety. These will then be organized according to subject in order to make it easier for the reader. The same structure is used in the compilation. The template containing the subjects, the interview questions and the key words that I used as a basis during the interviews can be found before the interviews at the very end of the thesis.

The subjects and areas that I chose to talk about in the interviews were note reading, chords, music theory, aural skills, ability to improvise and text memorizing, how the informants experience and use these. I also asked if they feel that their dyslexia has had an impact on their music making, how, and if they, in that case, felt that the impact was positive or negative. If they had experienced any differences between themselves as dyslexics and other "non-dyslexic" musicians, as well as what they saw as their strong and weak musical sides. When the fixed structure was added in the presentation I also added the headings "*Expression and feeling*", "*Approach; learning*" and "*More*".

Compilation

Compilation of the interviews, result and analysis as well as personal experiences and comments

The separate interviews are all enclosed. In the text below I have compiled the results of the interviews question by question, subject by subject. I have also added my own reflections and experienced beneath each question. The material is structured so as to make it easier for the reader.

1. The impact of dyslexia on music making

Do you feel that your dyslexia has any impact on your music making? If yes, positive or negative?

On this question informants one two and three all answered ”both” right away, that the dyslexia affected their music making in both a positive and negative way. Informant two further claimed that dyslexia has a huge impact. I interpret the response of informants five and eight as a yes although the impact they describe seems to be just negative. Informant six is also at first focused on what can be difficult and describes a great negative impact. The answers from informants four and seven was that they did not know or that it was a difficult question to answer. Informant eight and nine do not give any clear answer to this question.

Personal reflection: That dyslexia does have an impact on music making was a sense that I got consistently through all the interviews. The two amateur musicians had not thought much about it and their statements were less clear. I felt that three of the somewhat younger informants who were students at the beginning of their pedagogical training were somewhat more positive than the others. Informant five brings up how he feels he has a weak sense of rhythm as a result of the dyslexia. I can partly understand his reasoning but not quite understand the involvement of the dyslexia. I would rather say that the problem lies in note reading, which is related to dyslexia and that he experienced a poor sense of rhythm as a natural result of flawed note reading. If you get stuck while note reading I see it as a natural reaction that “the foot stops”.

2. Note reading

Note reading is brought up as a negative side of dyslexia’s impact. All informants but one experience problems with reading notes to different degrees. Informant nine is however quite different from the others. She has no problems with note reading at all.

The problems with reading notes for the others is partly a question of pace, as the informants see it, to be able to decode the information in the short period of time that they are given. At a slow pace their ability improves, although not too slow, informant three clarifies. The amount of information is also important, the more information the harder it gets. An example of this that is mentioned is with written notes for the piano where several systems need to be read at the same time. This kind of problem is experienced by informants one, two, three, five, six, seven, eight, and partly by informant four. The approach that is mentioned by informants one, two, four and five in these situations is "one thing at a time".

Situations when sight reading is necessary are experienced as the ones where the problems become most apparent and tangible. In this respect singing is experienced as easier than playing an instrument, which is mentioned by informant one and three. Informant nine who does not recognize these problems can still miss certain other kinds of information among the notes as a result of her slow reading when it comes to text.

Informant five describes note reading as the wrong approach for him, that he cannot get further with the approach and that it was rather hard "to get half way through Ackis (the Royal College of Music in Stockholm) to then realize you are doing the wrong thing" (further information under question five, informant five, in the attachment)

The graphic image is used as an aid in note reading, something informants one, six and also nine bring up. You use only the information about the distance between the notes without connecting them to the note names. This is often difficult when there is a new line however. Informant six also mentions "scanning" the whole image.

Note reading takes a lot of energy for the informants, something informants two, six and eight describe. Informants two and five mention that they do not feel that their note reading it automated. According to informants two, three, four, five and six it is necessary to learn the notes by heart and memorize them in different ways and informant one claims not to look at the notes naturally. Several of the informants are able to use the notes as a tool to aid their memory, a visual tool, covering form and similar things. This is particularly true of informants two, three, five, six, seven and eight.

Informants three and eight mention especially the problems with writing notes themselves, problems that they experience when writing normal text as well. That the problems arise in the translation process between notes and practice is clearly mentioned by informants one and six, and partly by informant nine. Informant one clarifies that musically she is no different from others, only when it comes to things having to do with letters and symbols. Informants one, two, three, four, five, six, eight and partly nine claim never to see notes in their minds or in their thinking.

Personal reflection: Note reading causes a lot of problems and the informants use a variety of ways to get away from notes as quickly as possible or completely avoid them if possible. I feel I recognize several of the problems that the informants experience in their note reading from "regular" text reading. For starters they have the problems with different "formats" in common. The information in both text and notes is two-dimensional, that is to say flat. The format that people with dyslexia mainly use is three-dimensional, which can cause problems specifically in these cases. These problems are partly in the form of how you interpret your surroundings in "wholes". This affects the reading direction, which of course is used when reading notes as well. The three-dimensional thinking also results in automatically adding a

dimension to the note sheet. This can result in the information not seeming entirely fixed, which in turn can be distracting and make the notes hard to reach. I experience a similar feeling when I read notes as when I read texts with the intent of interpreting the information. The same feeling of drowning in the mass, not being able to hold on and hold still but sliding towards the edges and being pulled down or away into the depth. This is what I interpret as the explanation as to why informant seven cuts up the note systems to increase the distances between them. This would make it easier for me too, the more space between the note systems, the better. Below I will describe in more detail what I mean with the term ”different formats”. I will also include more detailed reasoning regarding the process of reading notes and my thoughts on the subject.

Different formats

The problems with note reading described by the informants are often connected to playing at the same time. Informant one describes a problem in the translation from notes to music and informants three and eight also describe that they experience this in the opposite direction. I find it natural that such an opposition might appear considering the two different approaches, theory and practice, or information versus execution. This is true especially for a dyslexic for whom the distance between the two is perceived as greater, as several of the informants say (further information under question four, music theory).

Note reading and theory have to do with the linguistic competence and are processed in the left hemisphere. It is flat, two-dimensional information that requires flat, two-dimensional decoding and processing. Aural skills, feelings, expressions and creation etcetera are handled mainly by the right hemisphere (O. Persson, 1990-91; Fagius, 2001). Most informants describe using these ”right hemisphere-abilities” to a greater degree and these seem central to their way of making music (further information under question five, six and seven). That the situation is such is not that strange when you think about it. A person with dyslexia often experiences problems with flat information connected to the language centre and the way the left hemisphere handles information, as is the case here. They experience problems at different levels around notes and/or theory. That they then ”lean to the right” and to those abilities in a way that will help them is not strange either, as dyslexics have a larger right hemispheres (Kere & Finer, 2008) which is also more active in their thinking.

The format that dyslexics use is three-dimensional (right hemisphere-inspired) and the kind of problem you face as a dyslexic concerns flat, two-dimensional (left hemisphere-inspired) information, which notes and theory to a large degree are. Playing by ear and playing in general separate from notes, works just as well in a three-dimensional format, and could also be advantageous at times (something I will expand on further ahead). In these areas the informants do not experience any problems.

If in general it feels like a clash of formats and a problem of translation to move freely between these two formats it is not so strange that it does in the area of music as well. In my opinion one probable theory is that when flat, two-dimensional information is interpreted it needs to be remade into a three-dimensional format to be comprehensible for a person with dyslexia. As the translation process also takes time it is natural that this results in having difficulties with finding the time to interpret all the information contained in the notes. The distance, the feeling of inaccessibility and difficulty in mixing theory with playing that several

of the informants mention, could be explained by this reasoning. It could be that it is simply a matter of different formats, playing and aural skills versus notes and theory.

The note reading process

"Sounding", one letter at a time, is a reading technique used when learning to read and causes problems for someone with dyslexia. I suspect that this technique is used in a similar way when introducing note reading, which could also be a problem for the dyslexic. This technique is linear, and proceeds from details, taking one piece at a time and not forming a whole until the end. I find that the strategy used in the background part *Music and dyslexia*, which describes note learning, strongly resembles a synthetic way of learning to read (Svensson, 2005, p. 13-14), which I also present in the background part. You go from automating individual symbols the sounding with one tone at a time which ultimately leads to a more automated decoding of larger chunks and units. From a phonological/sounding way of reading to an orthographic. As a dyslexic you can have difficulties switching between sounding and whole-word reading, which causes you to mainly use one of these methods (read more in the background).

I and many dyslexics with me skipped the sounding process and went straight to the image/whole-word reading, which can cause you to subconsciously guess what it says, confuse words that look similar and have trouble with new words. It is also possible to get stuck in sounding reading which is slower, and not be able to move on. This is something I believe might have happened to us, me and the informants who do not feel that their reading speed is adequate when it comes to note reading. I have probably been getting stuck in the sounding when I have read notes and not been able to get to the effective and fast orthographic reading of larger units.

It could also be that you read holistically but without having the meaning automated, so that the sounding is not there as a basis to lean on. That you read in chunks but guess and so lose part of the information. Informant six has another scanning, holistic approach which I interpret as being relatively fast considering the level he is playing at. Informant nine has an incredibly fast way of reading notes which also has to be more holistic and figurative as she quickly and without problems reads scores and organ notes. Something I would like to know more about is the pedagogy that was used when she first started learning notes and reading, and what role that played. If it might have been different compared to the pedagogy that the other informants were "exposed" to. She does not feel that her note reading and text reading have anything in common, which indicates that she uses completely different ways of decoding in the two areas.

Reading texts and reading notes are in certain aspects very different things, as one can see in for instance informant nine where the difference is big. In text there are words, symbols that are divided into clear units. Notes and music are also divided into certain units such as phrases and melodic lines but not at all in the same clear and necessary way. Notes are often not as close to each other as letters, in terms of distance, which facilitates note reading somewhat in that aspect. However, here several symbol languages with different kinds of information are involved at the same time in reading. Information about pitch and note value often exists in just one symbol and beyond that several note systems can be used at once, with different clefs and symbols for nuances and dynamics when it comes to the style of playing, changes in pace, expression and articulation. At the same time text can be involved as well. I feel that decoding

when reading a text is more complex in its expression, there is only "one" element or way of decoding involved, but it requires more precision in a way than note reading. This is apparent above all when it comes to meaning, which is another important difference as we are talking about two different "languages". The meaning and understanding that you get out of a text versus notes are completely different. It is a question of communication in both cases, but different kinds of communication.

There is also a graphic aspect to the reading process of noted music which reveals parts of the content and that does not exist in text. In the notes you can "read" the note lines as well as receive information regarding the length of the notes simply by looking at the distance between them. The way I see it notes have a more complicated process of decoding but texts require a greater precision in the understanding. In this aspect notes are somewhat closer to the music than text is to its content.

It would be very interesting to investigate this element further and try to understand what reading techniques the informants use, in which element the problem presents itself. If they, as with regular reading, have gotten stuck in one strategy and in that case, which.

Another similarity that can be found between notes and letters is that they are both abstract symbols that do not naturally appear in the three-dimensional image-thinking. I and all the informants except seven and partly nine claim not to be able to see notes in their minds, and probably not text and words either to a "normal" extent (further information under *lyrics* in question eight). Informants two and five feel that their note reading is not automated, which can also be explained with the previous reasoning. When I play music that I have learnt from notes, I know "where I am" in the notes while playing, regardless of whether I have them in front of me or not. I do not see the notes, however, but rather know approximately where in the actual or imagined note sheet I am. I see the note sheet in a graphic way, where the title is, the systems, but the melodic line itself is diffuse and blurred and with it the notes. I have to think the melody to see some kinds of notes in my head, but it is like they do not want to stick but rather fall away/down. A connection between the notes does not have time to emerge here. They only exist in the moment to then successively be erased and disappear.

Several of the informants describe note reading as being extremely strenuous. It takes up a lot of your attention and leaves little room for other activities. During normal reading there is greater activity than "normal" in the brains of people with dyslexia and this is probably true of the note reading process as well. Decoding probably works in a similar way in note reading as in text reading when it comes to focus. The more space decoding takes up, the less there is left for understanding, which sounds rather reasonable. This has to do with the "formats", as described previously.

The more information there is the harder it is to keep up. If you do not feel that you are able to keep up with everything you have to choose and several of the informants speak about focusing and using the graphic melodic line as an aid. You then use the direct information that you get from pitch using the distances between the notes on the note line. This was something I used a lot subconsciously myself when playing the piano. This approach helps you avoid using theory and note names.

Certain information suggests that the time aspect in the form of the amount of hours dedicated to practice and the time to figure out strategies, can have a certain impact on the note reading ability. The somewhat older musicians seem to have gotten further here. A lot suggests that a

maximal level exists for the note reading ability of a dyslexic and that this is below the "average". It also takes longer to learn the system from the start if this is done mainly in the wrong way, as some of the informants state.

Informant six brings up long and short term memory and the inability to work with information that exists only in the short term memory. This could be explained by the inability to handle the flat information and see the notes in your mind. When this visual way of handling that kind of information is not possible to the "normal" extent it is no surprise that problems may arise. This is also explained by informants three and eight who sometimes do not feel they can keep up with solely theoretical arguments, which often assume that you can see notes in front of you in your mind. Here there could be a link to Hellberg (p. 44) who describes how she has to write down all the different steps in the counting process in math to then keep track of what order she needs to do then. She, who is also a dyslexic, suggests that she is unable to see these in her mind in the same way as most. She also claims that you can get far within the often mechanically taught math if you have a good number and letter memory, which she, as a dyslexic, does not.

Another explanation for the difficulties in following theoretical reasoning, as mentioned by informants three and eight, could be linked with Hellberg's (s.8) "quiet world". If one does not have an inner monologue it could be difficult to reason that way (read more under subject five to six).

It would not be strange to from time to time get a feeling that it is only a question of normal note reading difficulties, difficulties that many can recognize. This is especially the case when the questions of time limits and great amounts of information are discussed. I would suggest that this is partly true, but the causes of the problems differ.

To summarize, the notes are a great problem for dyslexics. I feel that the results from my interviews to a large degree are consistent with the results in Miles and Westcombe (2001) and other literature that I have read on the subject. This also seems compatible with what I have believed and suspected before, that note reading blocks and is perceived as an obstacle in connection to dyslexia. It was sad to read in their book about the many musical talents that have been hindered because note reading in the end has blocked their way to music making and a career in music.

3. Chords

Those informants who play the piano or guitar (informants one, two, three, five, six and eight) all prefer chord names to chords that have been written out, except informant nine. They also do not experience any greater difference here in comparison to others.

Personal reflection: Here all but one who play a chord instrument feel that chord names are easier than chords written with notes, which to me seems logical considering the argument above concerning note reading under question two. I myself also very much prefer chord names to notes. The amount of information that needs to be read is a lot less and the distances between the names are bigger, making the information easier to read. As a dyslexic you can however experience uncertainty when another bass note is used in the chords, as to which is the bass note and which is the chord – as these can be confused because of the three-dimensional decoding. What confuses me slightly however is again informant nine who

prefers notes and who can feel that chord names become difficult when it comes to chords with added notes. Could it be that her music theory is not quite as central as it seems?

4. Music theory

The use of music theory varies between informants, but the majority chooses to do without it completely when playing. Informants one, three, five and eight do not feel that they use music theory at all even though they know it (though informant one can run into problems sometimes). They feel that music theory is not central in their musical reality in any way. Informant eight says that he is unable to think in those terms and informant three experiences a gap between the theory and playing. Informant five, who has a good grip on music theory, feels that there is a clear choice, if he uses the theory the images disappear. Informant nine also brings up this reasoning, the choice between feeling and theory.

Informants two, six, and nine use music theory in some way when they make music. Informant two does so mainly when learning, as she uses it to help her get away from the notes as quickly as possible. Informant six has always been very interested in theoretical connections and uses theory to a large degree. Informant nine also uses it to a large extent. They feel that the theory helps them see the music as a whole. Informant four has not read or leaned on this to any significant extent and is therefore unable to express an opinion on the subject.

Personal reflection: I am convinced that the two different formats mentioned above in question two also have an impact on the ability to think music-theoretically. Certain information in this area is built on the ”literary system” which is flat in its execution and might even be built this way specifically to be seen as such. To be able to practically think in certain theoretical ways it can be useful and sometimes even required that you see the information before you in your mind, which a person with dyslexia might be less equipped to do. This could be seen as an explanation as to why informants one, three, five and eight do not experience the theory as central to their musical reality. You know it and understand it but in practice - in using the music theory in a musical situation - problems can arise as there is no automatic or natural connection to it. Informants five and nine describe theory and expression as completely different things.

This is hence partly a question of problems that can be traced back to the different formats and abilities to practically carry out certain kinds of reasoning. But I feel, from my own experiences and my analysis of the interviews, that this is also partly a question of another kind of mapping - another way of approaching and working with music - which in turn is a result of the hemisphere’s involvement in the pursuit of getting the whole picture. You use the holistic perspective as a base, surround the concept to then step by step go into more detail. Playing notes is often an example of a reversed order, from details to the whole picture, which is probably largely a more common approach.

The holistic thinking and need to be able to see the big picture were things I had not counted on to be as apparent in the interviews. The fact that they were strengthens the assumption. For instance informant one talks about a personal kind of mapping of the music and informants six and nine bring up the need for and value of the whole.

I believe that the creativity - which Kere and Finer (2008) claim could be an ability that is stronger than average for people with dyslexia - to a large degree affects music making. For me this is important and an area that I appreciate. That rules and theory often are not as central probably contributes to a greater feeling of freedom in creation. This could also partly be a result of the creativity; that you do not let yourself be locked down as easily, so as not to lose that complete freedom. I for instance feel that I use the sound, my aural skills and the timbre I am looking for as a base rather than how the music-theoretically could or should be. I know the theory as well and am able to use it if I want, but feel greater joy and closeness to the music without it. That this use of theory does not happen automatically, as I know it can for others, is something I am partly thankful for. As I see it this grants me a great freedom, as I make music, for instance when it comes to improvisation and using certain keys (further information in part six).

5. Aural skills

Playing by ear and learning off by heart are methods that all informants, except informant nine again, use to different degrees. The methods are however used to a great degree by the majority of the informants. Informants one, two, three, five and eight see aural and memorization skills as their security and strength. Informant three uses almost only this way of playing, he can play everything as long as he knows how it sounds, something he has noticed that not everyone can. The same goes for informant five, if he knows it by ear there are no problems. He claims that his is the "right way" and regrets not having exercised it more from the start.

Informants one, two, three, five, eight and to a degree four state that music that has been learned through aural skills sticks in the memory both better and for a longer period of time than music that has been learned through notes. Informant two who is a classical musician has mostly used notes but if it were up to her she would prefer playing by ear in several contexts. The times she has come in contact with learning through aural skills she has appreciated it and noticed that she is good at it. Informant four is also mostly used to reading notes but he has to memorize it off by heart for the music to stick and to be able to play it. Informant six has not played much by ear either and is afraid to let go of the notes and trust his aural skills. He experiences his aural skills as different from other peoples', as uneven. Sometimes he seems to have absolute pitch, like informant eight, but stress affects it in a negative way.

Informant one describes how she feels that using her aural skills gives her a better overview. She has her own kind of mapping of songs that she has learnt through her aural skills.

Informant eight laughs and says that there are classical musicians that are unable to play unless they have the notes in front of them, which is something he cannot understand at all.

See personal reflection under subject six.

6. Improvisation

The ability to improvise, make things up and simply "go along" in musical contexts is more or less above average for informants one, two, three, six and eight, according to themselves. A strong ability to copy is also brought up by informants one, two, three, and (with some

graphic support) six. He feels he is able to play and make it up as he goes along, as he has knowledge of the styles of play of the respective genre.”Others read notes better, but I can play around those notes and they cannot”. He does not feel stuck in the same way. Informants four and seven do not give clear answers and during my conversations with informants five and nine we never really spoke about the subject.

Personal reflection: The reflections on aural skills and improvisation, subject five and six, have been combined.

”Others read notes better, but I can play around those notes and they cannot.” (Informant six)

Playing by ear and improvisation are clear strong musical abilities for the informants, beyond what is normal it seems. If these abilities are compensatory or natural strong abilities is something that the informants themselves are not sure of. I, on the other hand, am convinced that both conversations are valid and should be combined. The aural skills are partly compensatory, but above all the right hemisphere-influenced thinking plays an important role in this area and has a positive impact. A cautious biological explanation could be that dyslexics have a larger right hemisphere (Kere & Finer, 2008). As I have mentioned earlier the right hemisphere plays an important role for aural skills, improvisation and the ability to hear melodies (O. Persson 1990-91). According to Fagius (2001) the right hemisphere is responsible for the basic musicality, the ability to hear melodies, pitch, timbre and the musical structure in its process and as a whole. When, as dyslexics do, you have a larger right hemisphere than ”normal” this could have an impact on the musicality. The holistic thinking and intuition are also abilities belonging to the right hemisphere, just as creativity and the creating ability which surely also have a positive effect on the process of improvisation (further information under subject four) (Fagius 2001). That music creation could also be affected in a positive way, especially with recent and more available recording technique, is something I feel is very likely. Sadly this was not something that I included in my interview material but it would be interesting to map it in more detail.

On a very speculative level you could ask yourself if the three-dimensional way of interpreting and decoding your environment also affects the way you take in music. If this could be advantageous when it comes to aural skills and the ability to distinguish and experience music, vocal ranges and instruments.

As a result of this it could be that it you find it easier to perceive among other things melodies and musical structures - things that are incredibly important for your aural skills. The holistic thinking can here be an asset in quickly getting an overview of the structure, form and direction, melodic line and expression of the music. This is also advantageous for improvisation. There hence seems to be a lot to explore in this area. Through playing by ear in my education as a child I would have been allowed to make music during lessons as well, something I sadly did not feel I was doing very often. I used my aural skills when I made music at home, which led me to continue with music.

In the informants’ descriptions I can clearly distinguish a kind of music making that I choose to call “direct playing”. This is a kind of music making that goes directly between the musical idea of a note and the practical execution of this note through different grips. In this way of making music you go through your aural skills, not through music theory (for instance via the names of the notes). On the western concert flute I am also able to play just about anything as long as I know how it sounds. It took a long time for me to understand the note system as a

child and I tried to use the direct information available, the graphic pitch already mentioned. As a child I, as well as many of the informants (including informant nine) skipped the information concerning the names of the notes and only registering the distances between the notes when for instance playing the piano.

This ”free playing” as I call it, could to an extent be compared to the term ”soul” which Blakeslee talks about musicians using as a way of representing total elimination of intellect to the benefit of feeling in their music. “Intellectual training even tends to destroy the abilities that characterize soul”. The education destroys the natural non-verbal ability by making it more and more verbal as you get higher and higher in your studies. Adults trust the verbal analysis more here and the intuition less and less, which is a disadvantage for creativity and music learning (O. Persson, 1990-91).

Free playing has great advantages when playing for instance in different or “difficult” keys. Here the notes can add the more advanced patterns of thinking and the possible difficulties with reading. The suitability of the instrument for this kind of playing is of course also a factor. Looking at flute playing it is possible to say that the difficulties with the key signatures lie primarily in the note reading process and the inexperience that comes from not encountering them as often. The way you learned this from the start also matters, as well as if it is added on later in life and the fact that reading involves more steps from the start. If you know the music more intuitively and aurally “the fingers find their way” to the minor and major steps and skips.

This direct path that the informants mention and use is more or less a prerequisite for music making in those cases. I also believe that non-dyslexics can use this method when they play by ear. The difference is that dyslexics often can be more dependent on this method - as a result of the problems that connecting to music theory in that situation can lead to - which means that we use and train this approach to a larger degree.

Direct playing, which does not go via theory, leads to a great freedom in music making. The ability to improvise, embellish and just “go along”, which several of the informants mention, to me seem to be great advantages of this approach. This approach, this shorter path, can also lead to finding yourself very close or perhaps even “closer” to the music, as several of the informants feel they do. Several of the informants claim to have a talent for and closeness to expression, images and emotions and that this connection is often automatic. This might not be so strange considering their way of thinking and, once again, the involvement of the right hemisphere. This is where processing of emotions, color, form etcetera happens. The image-thinking, which dyslexics use a lot as it occurs naturally in our thought pattern, also happens here.

It is almost striking how many of the informants describe this way of working completely independently of each other. I would suggest that the connection between dyslexia and the proximity to feelings and expression when playing is not a coincidence. Non-dyslexics probably also use this kind of thinking when they make music but the ability to do so is strengthened for dyslexics and perceived as easier as a result of the preconditions of people with dyslexia. If you already have a natural proximity to the images and feeling in your thinking it is not strange that this also affects you when you make music. I feel I can see a clear advantage here as a result of the “dyslexic” thinking and way of working.

I interpret the music making of the informants as being partly intuitive and in a way rooted in the body. This seems true when it comes to for instance their sense of period and form, as informant six brings up. The motor memory seems to be used a lot by many of the informants.

Another aspect of being ”closer” to the music is the approach that several of the informants bring up, for instance informant two. They describe having to know the music extremely well, which takes a lot of work. Informant five feels that others who have better note reading abilities do not seem to have to do this. He does not believe that they have to be able to sing the music in their heads, something he sees as an important tool. The informants speak about a presence and inner hearing of the music. This could also affect the expression and presentation in a positive way as well as the focus, the presence and the strong previous knowledge. The music seems to be deeply rooted.

The aural skills of all but informant nine are very developed. This is probably a partly compensatory ability but also partly connected to the reasoning above. With the help of the three-dimensional image-thinking you probably have an advantage when it comes to quickly gaining a complete aural picture and finding connections and patterns in a direct manner, as previously mentioned. Nine of the ten informants show talents beyond the perceived average here. Informant nine deviates here and experiences a lot of problems when playing by ear. A possible explanation is that this is a question of different formats and the clear choice between these. Dyslexics experience a great difference depending on which approach is used and can mainly use only one approach at a time. The situation of informant nine is opposite to the situations of most of the other informants. The informant uses notes a lot and well, so this is probably her chosen approach. She has difficulties with using her aural skills at the same time, in other words the “one thing at a time” approach still seems to apply. This has led to her to not developing her aural skills, which she in a way has not “needed” as she is able to read well. This is something she herself to a degree sees as a negative consequence and it is partly something she regrets.

The internal hearing of the music is described by the informants as very strong and clear. Sometimes it is mentioned that the internal speaking is not as prominent in people with dyslexia, taking into account that you as a dyslexic do not use the verbal thinking (where the internal monologue is a natural part) as a starting point (Davis, 1999, p. 117). The immensely quick non-verbal thinking functions much faster than the verbal thinking, which mainly functions like speech, linear with time. The non-verbal image-thinking can be perceived as intuition-based and subconscious because of its speed (p. 97). Hellberg (p. 8, 2002) claims that this dyslexic world is silent, that the sound (speech) is linear and that the natural inner monologue has to be taught. This suggests that the speaking kind and the musical kind which the informants describe are not the same kind of inner monologue, as the observations give different results. This could indicate an important difference between the thinking of music and thinking of normal language, that they are portrayed in different ways.

The question of whether the informants and I really hear the music within us or only feel that we do through the images can however also be up for debate. This could then lead to a difference when playing by ear compared to others who mainly use verbal thinking. This could mean that a non-verbal image-thinker/dyslexic would have a faster speed also when it comes to this kind of playing. A verbal thinker is more dependent on their inner monologue in real time. This could be an explanation to the perceived “lightness” that the informants describe in relation to playing by ear and improvising.

That playing by ear is an obvious part for the informants is also clear from their comments. Informant two assumes that everyone would prefer to learn through playing by ear if they had a choice, which I partially doubt. I feel that she in this instance sees her strong aural skills as so natural that she thinks everyone has them. I repeat that informant eight laughed when he talked about knowing musicians who cannot play a note without a note sheet in front of them, something he does not understand at all.

Speaking of aural skills I used them myself when learning new words when I was in primary school. Because this is an element that is often perceived as difficult for a dyslexic because of the missing "cheat sheets" of words in their mind, I used several senses. I wrote the word several times and learned through aural skills how it sounded when writing the word on paper, the rhythm that the tip of the pen made as I wrote each word. In this way I could in a way check that I had written the word correctly during tests, if it "sounded" right. I think this happened subconsciously at first and the tests went well, I am however quite unsure of if it helped me in the long run.

The aural skills that informants one, three, five and eight emphasize are the "pure" aural skills that are not connected to theory, something that is important to be aware of. Informant three describes the courses in aural skills going well at the college, as they did for me. I would however clarify that I felt that the teaching in aural skills was always connected to theory and never pure training of the aural skills, which is too bad. I wonder if the perceived uneven aural skills of informant six could have to do with this reasoning.

One of the informants had trouble with playing by ear, which was also the case for some of the people interviewed in the book written by Miles and Westcombe. I believe this has to do with the "formats" and with difficulties with switching between different approaches. If you only use note reading as a base in your playing this could lead to not seeing the connection as clearly to aural skills and listening. This would then be independent of the level you are at in your note reading. Informant nine experiences a lot of difficulties with her aural skills but has no trouble with notes. Most likely she has never "had to" use her aural skills, as her reading has been so good. The people interviewed in Miles' and Westcombe's book also experience problems with note reading in these cases as I believe note reading takes so much energy that there is not much room left for anything else. Just as the ability to understand what you are reading can be negatively affected by the problems with reading text.

"A good musical ear and good musical sensitivity may have carried the child through the first year. Then the pieces get longer and sheets of printed music are needed".
(Brand, www.resourceroom.net/gtld/ida_music.asp)

This is a quote that I do not agree with. The fact that it might often be this way does not mean that it should or must. That a person, after just a year of playing, has to use notes, does not have to be true. There are other approaches that are mentioned for instance in the interview results. One example is playing by ear, which can be a great resource and which we sadly do not use as much as we could. You only need to look at how this is used in other cultures and in our own folk music with its traditions, and how it has been used in the past.

Something I feel is hard to get a grip on is the informants' own definitions of themselves, which level they are referring to. I feel for instance that informant six has better aural skills than he states, when he claims that they disappear when he feels stressed. He does however state that "well, you can always play the blues…". The aural skills described his definition of

"bad aural skills" are probably at a higher level than the aural skills in the "average" description of "bad aural skills". He uses himself, who is at a high musical level, as a reference pole.

7. Expression and feeling

Informants one, two, three as I interpret him, five, six, seven and eight feel they have a talent for musical feeling and expression. Feeling is an important and very present part of informant three's music making, based on his text, as is the case for informant five. He describes seeing and feeling the music in images and stories, that colors and feelings come automatically. Informant two and nine describe something similar, that feelings, images and events come naturally. In these situations informant nine does not think about theory, it is a case of "either or". Informant two fuses the graphic image of the melodic line in his image-thinking. The character and feeling need to be present in the images and she finds herself in that environment, as well, climbing mountains. "It is like a movie" she describes it. When I ask her how she thinks about the music she responds that she thinks it in images and stories.

Informant six believes that all dyslexics generally are good at things having to do with personal interpretation of music. He thinks that you are more creative and have a talent for coming up with new notions and ideas. This might also be because you are not as bound down and can connect things in different ways. He also feels that music is a higher emotional state. Informant four, no answer.

Personal reflection: It seems that the informants have a strength and talent for these areas as well. I do not know if this is something all musicians would claim to be good at but it is probable that as a dyslexic you have a talent for feeling and expression as you can connect this to the image-thinking. I am convinced that the image-thinking here contributes in a positive way. A choice that several of the informants clearly describe is between theory and emotion/images, it is also here a question of "either or". It is very possible that this, too, could be common. I feel that the ability described - to think in images and stories and to easily be able to go into the music and the environment you are portraying - is striking however. If you already have image-thinking and a strong creativity it is not strange that the images and stories easily come to you in an almost automatic way. The path between music and this kind of information also seems shorter and more direct. You have an easier time associating and giving the music a parallel story and understanding. This kind of information is normally processed by the right hemisphere and the format is three-dimensional, which the dyslexic person already works with. No translation, which may normally be necessary for others, is necessary in this area. The format is already the same. This could be an explanation to the perceived closeness – you are always there.

It was interesting to hear that so much that is connected to the image-thinking was raised in the conversation, even though the informants did not have any "previous knowledge" of the dyslexic way of thinking. Informant two describes entirely on her own initiative how she builds entire film sequences around and stemming from the music pieces. Informant five also has a "thought trough" and clear approach to this way of working with music. He also has a methodology around this area which he uses mainly with the older students.

8. Text: ability to memorize lyrics

For several of the informants (three, four, five, eight and nine) learning lyrics off by heart is a big problem. The singer, informant one, as well as for informant seven are the exceptions to the rule. Informant three describes himself as "extremely bad" at learning lyrics by heart and feels he is lacking a good approach in this area. Informant five is "completely rubbish" and feels he also easily forgets lyrics that he actually knows. He does not see them in front of him in his mind but has experience of how it can make things easier to relate the lyrics to images. Informant eight says that learning lyrics is hopeless and almost impossible and informant nine states that is it very difficult. She and informant two realize during their interviews that they do not see words in their thinking. During the interviews of informants two and six we did not talk about the subject of song lyrics.

Personal reflection: In this area the informants feel they have a lot of problems (except informant one, the singer) which I again think leads back to the thinking. You are unable to see words before you in your mind (which by the way, is something informants two and nine realized "live" during the interviews) which people otherwise use as an aid when memorizing text. I would like to make it clear that I did not tell them about this inability beforehand. Informant five talks about using images as an aid, something I also do. These mainly help with understanding and content however, the problems around the exact order of the words remain. I myself experience the clash of formats most clearly when I sing, a situation in which I am, and want to be completely in the music. I am unable to rely on the fact that the lyrics will come even if I know the song well. To feel more secure I often keep a note with the lyrics nearby.

This is however not true when I sing in a language that I do not know or understand word for word. I often sing songs in different African languages and in these cases the lyrics never cause any problems after I have learnt them. Here I am completely secure. The reason, the way I see it, is that I learn the songs completely by ear, which is my way. The information is then stored and processed in "another place".

It is when I sing in languages I know that problems arise. I have no problem finding the feeling and context in the lyrics, they are there quite clearly. But to remember the right word in the right order is difficult, even in songs I have written myself. Here as well it is as though there are two separate and divided elements, words versus understanding, flat versus three-dimensional. In a way it makes it easier for me if I have never seen the lyrics, but in another way it helps me. I sometimes feel like a living record, the music teacher who teaches songs all day, without knowing a single one of them herself.

In Miles' and Westcombe's book (p. 51) one person describes having difficulties with remembering lyrics but states that she remembers lyrics from her childhood. She believes that this is because they are so closely connected to images. She describes seeing them like a movie in her mind. Here I feel I see the clear role of the image-thinking and a description of the movie-thinking that is described in the background by Davis. As a child she probably learned the lyrics by ear. To learn without having seen any text is something I also believe affects the scope of the images and the direct connection to meaning (in images and feelings) in a positive way.

I am hence convinced that this problem has to do with the non-verbal thinking, the image-thinking, or rather, the absence of the ability to think verbally. Hellberg (p.9) also talks about

these problems with lyrics. ”It is impossible to learn lyrics off by heart” and ”to organize things in the right order”. She claims that this is because “the memory” does not add the sequence of words like a pearl necklace but rather like pearls scattered on a table.

The way I see it, if you do not have the ability to see words in your thinking, this naturally leads to perceived difficulties with memorizing information through this method. Several of the informants did not make this connection and instead felt that it had to do with lack of training or laziness, which also appeared in the answers to other questions. Which seems typically dyslexic, I must add: to have trained endlessly and still blame laziness. But that is not the case. In certain situations you have to fight like an animal, in others you find things very easy, and there are explanations, other explanations, for everything.

9. Different approaches to learning

Beyond what has already been mentioned on the subject, informant one brings up the motor memory that she uses. So does informant five who says it is something he wants to get away from. The internal hearing, hearing the music in your mind, is also brought up by informants five and six, who also talk about the need for strategies. Informant seven clarifies that she learns things one step at a time, which informant nine partly does as well, who describes a very structured, methodological and effective approach. Informant two describes in detail her way of arriving at the whole picture.

Personal reflection: The importance of structure and the whole is clear in the interviews, and is also emphasized in literature. You want to get an overview and see the whole picture when you make music, something you achieve in different ways.

The motor approach is quite commonly mentioned by the informants. I myself feel that I use my motor memory for some parts when I play and I do not feel that this is as negative as informants five and partly six feel. Informant five firmly insists that this is something negative and something he wants to get away from. If it is the case that the music is more intuitively and directly connected to dyslexics, perhaps motor skills to a larger extent are a natural part of playing. Perhaps it is even inevitable in the stages between musical thought and playing?

I believe that this is the case. That dyslexics to a large degree prefer to automate the sound with motor skills, an important part of the fast “direct playing” and the perceived freedom with the instrument.

I remember as a child often sitting and playing my piano homework on my bench in school. Some of them I still know in that way today. “Gavott” from the green book ”Vi spelar piano” (We play the piano) if I remember correctly. I also sometimes use the beginning of this song as a trick to keep track of right and left. Sometimes I can also use my motor skills and write in the air to find a word through either confirming or spelling in order to get some kind of mental image to the extent that this is possible. This is something that I have noticed that others with dyslexia also do.

I also use the up and down movements of the melodies a lot. To me the pitch feels automated in my body. When I teach songs and music I almost always show the pitch to indicate differences between the different notes and make it clear and visual at the same time as the students hear it. When I teach song to bigger groups I often show the pitch with one hand

parallel to the other information. This happens almost automatically when I want and I do not have to think about it. This is also something I sometimes let the flute students use themselves to better root the idea of the pitch, but also as a tool to use when playing by ear or copying. I also include elements of this in the warm up exercises in classroom teaching, for the same reasons. If the pitch is unclear this can be a good step to take before playing and it roots the pitch further, as well as in your body.

The motor memory is also mentioned by Oglethorpe (1996), who describes how, as a dyslexic, you often have a very developed kinesthetic, body memory, which you could use more as an aid (Oglethorpe, 1996, chap 5-6). This could explain why this kind of memory is often used and mentioned in the interviews.

In accordance to Lilliestam's (1995) four approaches to learning and memorization I find that the aural memory if often used in connection to dyslexia. The visual memory is used but the informants did not touch on that subject beyond what seems "normal". The kinesthetic and tactile memories are also used to a relatively large degree, although without being appreciated by some informants. The verbal memory I feel I see less of however, such as through expressions and reasoning based in music theory. I do believe, however, that the visual memory can be complementary and of use when given verbal information. That you would rather look and repeat than for instance extract information about how you should grip the guitar from oral instructions.

Beyond this I have already mentioned different approaches to learning when writing about the other subjects.

10: More

Informant one describes the feeling of not being equally respected. Informant two feels it is wrong to be asked to sight read in front of others. Informant six suggests that the Royal College of Music in Stockholm should change it pedagogy for dyslexics and that perhaps the entrance exams should be of a different kind as well.

Informants three, six and five describe a strong pedagogical interest. Informant six sees dyslexia as the cause of this while informant five is used to pedagogical thinking as he has always consciously tried to find solutions for himself. He feels it is easy for him to analyze and see the students' problems and strengths. Informant nine feels she is very analytical, an ability that she might have developed while reflecting over her abilities and inabilities when it comes to text. She also says it might be a result of the fact that she needs to process written material a thoroughly.

Informant six clarifies that he feels that one as a dyslexic should learn notes, but in the "right way", with a dyslexic or someone who has training within this area as a teacher. Informant eight also states that another kind of pedagogy is needed.

Personal reflection: That a pedagogical interest is raised by the teachers and students studying teaching is in itself not strange. In his book Davis (1999) describes how image-thinking leads to quick deductive abilities, the ability to quickly see connections and results. This is also a useful diagnostic ability within teaching. Some of the informants state that their own problems have caused them to reflect on pedagogical phenomena. Informant five feels it

is easy to analyze and map the students' competence. I for one understand his pedagogy well and think in similar patterns, one step at a time and with analysis as an important part. The pedagogical interest and abilities could also be seen as positive consequences of dyslexia, as Davis claims, something that is very useful in many different contexts. It is therefore a shame that the amount of dyslexics that return to the world of education after they finished their own is not large. This is quite understandable, but nonetheless a great shame. The world of education misses out on the "realistic" competence that it is in great need of. The understanding of dyslexia in this field is far too small, which sadly affects the students with dyslexia in a negative way.

The understanding is not adequate in musical contexts either, such as music and culture schools, for instance the Royal College of Music in Stockholm. In the interviews the feeling of not being equally respected sometimes appears which I see as something striking and serious. Situations where the informants have felt exposed are brought up and described. Requests for changed and adapted pedagogy are raised, something I can relate to. The call for change in the entrance exams was also discussed, which I myself have experience of and want to emphasize. The tests that require sight reading are particularly debatable. This is something that needs to be reflected on and it is important that a discussion is started and gains more depth as soon as possible in this area.

Conclusions

In this part of the thesis I will first describe the conclusions I have drawn from the investigation under different headings. I will then discuss these results from a more practical standpoint as I connect them to music-pedagogy. Lastly I will present concrete advice for music-pedagogical contexts in list-form, this so as to make it as clear as possible for the reader.

The connection between dyslexia and music

There is a clear connection between dyslexia and music. Dyslexia has an impact, both positive and negative, on many musical areas, which is a natural result of the way in which people with dyslexia work. To start with there seems to be evidence to indicate the impact of the so called three-dimensional image-thinking on learning and playing after notes. Here this kind of thinking has negative results for the decoding, the reading process as well as the processing of and thinking around these symbols. The problems surrounding note reading also conform to the result in the literature (Miles & Westcombe, 2001). Notes are two-dimensional and require flat decoding. If you instead decode them three-dimensionally, which you do as a dyslexic, it naturally has consequences. With the three-dimensional decoding it can be seen as though the notes "come to life". When another dimension is added the picture gains depth and the connections between the notes as well as the information become more unclear. You get a lot of information from the note sheet but not only information that is of use for the intended purpose. The holistic seeing has the consequence that one reading direction is not used naturally, rather it has to be taught. It takes a lot of energy just to try to take in the small units, note by note, left to right. This also results in difficulties keeping to the same note line and it is easy to jump to the wrong line when you are supposed to jump to the next. You do not see the notes or other symbols naturally in your mind. A note is, like a letter, a symbol which, unlike an icon, symbolizes something else. Information that normally has no natural connection to its symbol needs to be learned and then automated. If these flat indirect symbols are not in your thinking, as a result of direct image-thinking, this can lead to difficulties in automating for instance the connection between the look of a note and its name or grip on the instrument. This could indicate that the music is interpreted directly only as sounds or as images. Notes do not exist when dyslexics memorize music. The three-dimensional thinking, which results in the inability to think flatly, affects the ability to think and reason in a music-theoretical way and makes this more difficult.

The use of music theory in music making is also limited for dyslexics. In this area "direct playing", which is free from theoretical aspects, is preferred by many musicians with dyslexia. I interpret it as though you start with a musical idea in the form of sound and go directly to the execution (playing) without connecting it to the "memory support" found in music theory in the form of note names and so on. This direct path is short and quick and the

automation has happened to a larger degree between the sound and the motor grip on the instrument. This leads to “knowing” your instrument well, as well as experiencing an ease in playing spontaneously. If you just know the way the music sounds you can play it. An example of this is the great ability to just “go along” with the music. The ability to, through your aural skills, with ease jump right into an ongoing musical flow and context.

The ability to play by ear and improvise is also strong. These two approaches are used a lot by dyslexics themselves but are sadly not common in the musical education that they participate in.

The closeness to expression and feelings while making music is described as very important and seen as easy. Here the three-dimensional image-thinking is a great advantage, as it means that it is easy for you to imagine and be in different environments mentally and perhaps also root the feelings more deeply. In this area no translation process between the formats is necessary, especially if you subconsciously already translated the music directly to images. It seems that the internal ideas could be more tangible in their expression than for others who do not have this image-thinking to the same extent. The strong creativity connected to dyslexia probably also has an important part in the image creation around the musical meaning and “story-telling” of its musical content.

The ability to memorize music seems strong in comparison to ”normal” peoples’ ability to do so, except when it comes to song lyrics. Here many dyslexics experience huge problems, which are caused by the inability to see text and words in your thinking to aid your memory. It can be perceived as next to impossible to learn song lyrics by heart, and working on this is normally very taxing. What is more, even if you do succeed you can suddenly loose fragments of text, which means that it is difficult to achieve an experienced security in the area.

I feel I am able to see the hallmarks of the “dyslexic brain” also in music. The musical areas that Fagius (2001, p. 89) describes as being processed by the right hemisphere are to a larger degree strongly represented in dyslexic musicians, while those that belong to the left hemisphere can be perceived as weaker. Ability such as to hear melodies and pitch and to portray the musical whole picture, versus note reading and theory.

Consequences of dyslexia in music-pedagogical contexts

In this chapter I will present concrete music-pedagogical consequences of my investigation and my experiences of dyslexia.

My intent is not to impose my own thoughts and ideas on anyone but simply to, in a concrete manner, express a few things that may be worth reflecting on in music-pedagogical contexts, from my perspective. I will end the chapter with a part called "*For teachers*" where I emphasize some elements in the world of education that are connected to students with dyslexia and possible situations from both a teacher and student perspective.

Notes are currently used to a large extent mainly as a music learning approach in the west. Considering the problems that dyslexics experience with note reading as a result of the symbol thinking and three-dimensional decoding, note reading as a means should be reconsidered. The notes can be perceived as an obstacle, which affects the music making in a very negative way. The consequence within music teaching could be a limited use of this system. Notes can be taught and used if note reading is the goal, but not as a means. If the purpose is to learn music there are more effective and better suited ways. Music-theoretical context is another thing to look out for, in particular in relation to the music making. There are no limitations on playing by ear and improvising within music, and so these should be included as important and clear elements from the start. It is within these areas that the security will most likely be found, something that is very important for the well-being and self-esteem. Feeling and expression are strong abilities that can be used as a base when playing and practicing. It is appropriate to relate the music making to these abilities, to root the music and knowledge through these abilities as well as to memorize the music using images, emotional understanding, aural skills and motor skills. It is fruitful to use several approaches and angles in music teaching at the same time. This is also true within one single element, to use all your senses and build a whole. It is also useful to make the connections between these clear.

Pedagogy

My goal is to find a methodology that suits people with dyslexia to a larger extent. I cannot state often enough that dyslexics are different from each other and use different strategies, which makes it difficult to find something general which fits everyone. This is not my ambition however, if this pedagogy can help only a few I will be satisfied.

My main goal is to spread understanding mainly among teachers, and give them tools and advice on how to approach a teaching situation. I want to spread awareness about what might cause problems and what might make things easier as well as show other methods and

approaches that can be developed. I want to show partly what to "look out for" and partly what to use more. Advice that can be used to make the music education better suited for more people, or more specifically people with dyslexia, in all contexts, from individual instrument tutoring to classroom situations.

I will talk about this under two main headings: "*Do/use and explore*" as well as "*Do not/be careful with*" . It is important not to get stuck in the things that the student cannot do but rather to think about what the person in question is in fact able to do. I do however see great value in talking about the different preconditions so as to avoid misunderstandings. Knowing what to do, how to do it and why we should do it can take us far but to begin with I will present and treat some of the areas in more depth. As a teacher you have to let the students approach music in "their" way, which is important that they are able to train. Everyone has the right to make music and if playing is the goal how you get there is less important. In what way the goal is reached is a more individual question. What is important here is that there is room for different alternatives.

Note reading – never as a means

A lot indicates that the note reading ability never reaches an effective level for dyslexics, either when it comes to reading speed or as a learning strategy. Most likely we will always be "behind" in this area. I still think that you should introduce and teach note reading to these students, they have a right to know how it works. Use this then as a goal, however, not as a means. It will not be effective and automatic enough as a means. As a dyslexic you should not use this method actively in your music making if the purpose it not to train to use it. You have the same ability to understand how it works but not the same ability to automate it and use it in an active way, like some other processes.

You should however be thorough and explain the technique for this kind of reading (which information is used, emphasize reading direction and so on), in a clear way. You should point out the differences in different note sheets at the beginning of training, such as the look of the pitch and so on. You need to make this visual in different ways, for instance by letting the students themselves write and use this understanding as a basis. Emphasize why things look the way they do and try to avoid information that does not have explanations and that is built on "literary learning". Engage as many senses and perspectives as possible to make "root" the information. You should however not dig too deeply into this. To facilitate the decoding of notes you can mark different important places in the notes to make these clearer. Make the notes more adapted using direct information such as color, size, different layout and other kinds of information that stands out. This so as to be able to find your place in the note sheet more easily and quickly, without having to go in and "read". Miles and Westcombe also mention that bigger size and color can facilitate the note reading (p. 27, 51, 2001), as does Brand (www.resourceroom.net/gtld/ida_music.asp).

What you can do to make the reading easier is to magnify the note system, make the distances between the different symbols larger and the different symbols clearer, as well as to use colored paper to reduce the contrast between text and background. You can also make the learning more personal by for instance using different colors for different signs (Carver).

One-thing-at-a-time when note reading

The strategy one-thing-at-a-time is one that I see as advantageous, which should be made clear and emphasized as dyslexics take in the whole picture and see everything at once. The relationship may be such that it becomes difficult to know where you should start and the amount of information can easily become too much. If the decoding - the connections between symbol and meaning which in this case is a connection between sound and to a degree theory (which in turn is connected to the language centre in the form of note names and so on) - is not automated, problems can arise. If you then jump straight to reading the whole words, orthographic reading, difficulties could arise with the information that needs decoding. You see everything through the big picture, and not the details, the single notes, as easily.

I am convinced that note reading partly occurs the way normal reading occurs: Everything (or nothing) jumps out at you – not just the details/letters and words and not in a fixed order as is necessary when reading. For me, who is a relatively slow reader without any real ability to search for specific words in a text, it helps to mark certain words that describe the content if I want to be able to quickly see what content a text treats, as I then more quickly am able to remember the image I have built around that content. When I read I also like to underline words or mark them in another way, preferably as distinctive as possible using different colors so that I only have to read these words to recreate the memory of what the piece was about the next time. These words are then placed in another layer or filter, if I can express it in that way. This can also make it easier for a compact text mass. If you divide it into for instance different paragraphs, the whole text does not come out at you in the same way. I have noticed that the text then becomes easier to handle, when the parts are more separated. This makes the visual perception easier and I feel that the text looks easier to read. The different parts become divided into different layers and you do not drown in or get as exhausted by the great text mass that is otherwise involved.

If note reading after all is used as a means, you can read it first without the instrument. You can first read it using only the rhythm, then you can add pitch. This can also be developed further. One way of interpreting notes could be to clearly take it one thing at a time when decoding - to methodically go through the sheet, bit by bit, so that no blockades arise, and in that way isolate a perceived problem. This can be done through for instance checking the form - how is the piece built? What parts does it consist of? When the decoding of the notes itself begins you can start with for instance the rhythm, clapping or playing it on the same pitch. To isolate this further you can begin this process by putting forward a sheet with only the rhythm on it, to guarantee that no other information can distract, and then move on from there when possible questions have been answered. After this you can add the pitch to the information. If the student is at an earlier stage in the note reading you can also isolate the pitch before this step by putting forward a sheet containing just the pitch in a whole note rhythm. When you have gone through this together you can move on to a pitch with quarter notes, or go straight to the pitch together with the rhythm depending on the level of the student and how difficult the music is. When you then arrive at nuances, dynamics, articulation and so on, these could be on see-through-paper that you place either as an added layer on top of the melody or beside it. In this way you help the student by presenting an example of an approach to decoding and by making it impossible to “take it all in at once” as the focus is given. Note that the way I just presented does not stem from the holistic perspective, which could be advantageous. Instead, if you only want to use notes at this stage, you can first present a rough outline over the form of the piece, without playing. Show the

character, dynamics and nuances so that you, quite literally, are able to get an idea of the expression of the piece and where it is going. Here you can include a more visual meaning, for instance a story to portray the feeling to an even higher degree, something that is mentioned in the interviews as a means. Then you can present an overview of the melodic line graphically and then, step by step, go into more detail, which are then easier to take in, when the overview is clear. You then only need to add these to the image you have already created and build on it. To include the feeling and expression of the music from the start is, the way I see it, very advantageous.

One approach that you could examine within note reading technique from a perspective of reading technique in general, and which would probably be more advantageous than the analytical, is inspired by the ”whole language-reading”. To use images and units as a base from the start and in this way be able to use the strong power of recognition that people with dyslexia often have. Here you can also use the graphic information that the note sheet contains. A note sheet for instruments such as woodwind instruments, the piano and bow-strokes can tell you a lot of information simply through how it looks. This is because there are not a lot of technical obstacles that stand in the way of the instrument being played at a fast pace. And so a lot of information can be fit into a shorter time frame. The faster the music is and the more intensively it is played when it comes to speed, the more information the notes contain and so the demands on reading speed increase. In my case the Western concert flute is a difficult instrument in this respect, considering the speed at which it technically can be played and the massive information often contained in the notes. If you want the note reading to be easier you should choose an instrument which in that respect is slower or technically harder to play. The piano with its close to unlimited amount of notes that can be played at the same time is in this respect among the harder instruments when it comes to note reading.

Previous understanding also makes note reading easier. If you already have a certain mental image ready all you have to do is add to it rather than create a whole new one. I believe this works as with normal text reading. I feel a text is much easier to read if I beforehand know roughly what the content will be. It is also much easier to accept the process, I better accept to start reading in detail. I believe this to be true of note reading as well, although the image is then musical, consisting of sounds but also other things such as color, emotions, images and events in my case.

Miles and Westcombe suggest that stressful situations make note reading worse, as do accidentals (p. 28, 2001).

If you experience problems with theoretical note writing and this makes it difficult to preserve the memory of a music creating situation, technology such as recordings can be used as a way of avoiding this. This is also suggested by Miles and Westcombe (p. 20). It is of course also a strong tool to use in itself. It is said that Benny Andersson only used this approach when creating music.

Aural skills

Strengthen the aural skills and this way of playing and learning from the start. This is also something that Brand (www.resourceroom.net/gtld/ida_music.asp) emphasizes. He further suggests that you, as a means, can use singing at the same time, to strengthen the aural skills further. This should be included as an important element in all music teaching but is

especially advantageous when teaching people with dyslexia. This approach is to a large degree experienced as a security in music making, often although you have never had an education built on playing by ear. If this had been present also in the education from the start it probably would have given the informants more confidence and musical space, at a younger age. It is possible that you, as a dyslexic, more easily can perceive melodies and musical structures as well as having advantages connected to improvisation. That you also have a large "sphere of consciousness", as a dyslexic, an ability to focus your attention on several things and from several perspectives at the same time, might also indicate a greater sensitivity when it comes to attention - taking in information. This might be true of information that is received through hearing as well, as long as it is not phonological, having to do with words.

You cannot suddenly demand that someone should play by ear just because they ought to know it better, if they have never been allowed to hone that ability. Certain teachers have also concluded that it is cheating and therefore forbid it when teaching. I have myself often felt that playing by ear has been belittled by pedagogues in comparison to playing by notes.

Use the whole as a base in this area as well, to then, when the overview and feeling of control are present, move on to smaller units. The connection and understanding is important, as is musical form. If the pedagogy is closer to the student's natural way of taking in information his/her ability to take in the content will naturally increase. This can be difficult for the students themselves to realize which can lead to simply accepting the feeling of certain subconscious confusion. If I look back at my own education I often felt an uncertainty, as though I was not really in control. I played a great deal by ear on my own, but practically never did so when I was being taught to play the flute and piano, during the greater part of my education. If I had received a wider education I am convinced that some parts would have been easier.

These things naturally differ from person to person. As I have stated before, no dyslexic is quite like another. Generalizations should in this case not be taken too far and definitely not be accepted without questioning. As a teacher you therefore have to be perceptive and see which pedagogy and approach fit the student best, so that you can use these to expand his or her horizons. You should of course use different techniques as well so that the students themselves get an opportunity to try and get a feel for different elements, what they like and what they do not like/are not suited for.

I have experimented on this with flute students. We then went "backwards" you could say. The students were given a record to take home with a song that they were to listen to. They were asked to reflect on what internal images came to them when they heard the music, what they heard, which instruments, from what country it might come, and so on. Then they were asked to write down the form and think about the notes, the key and highest and lowest note. After this they were given the assignment to make a graphic image of the melody, to draw a line of its pitch structure. Then it was time to start playing. A reflection on my part concerning learning is that by this point they had already subconsciously learned the melody, so they could then just focus on playing.

Try to make the music completely free from theory through playing games and playing music based on other things such as images, stories, and other kinds of "symbols". With flute students I have played and improvised around feelings, environments, events, stories and words of different kinds. I have then drawn symbols and small images that they have been asked to put music to through playing themselves. After this they themselves have drawn

symbols which I have put music to. For the following week they were given the assignment to draw four symbols to themselves and an added harmony for me, which we then played in two harmonies and experimented with during the next class. We then recorded this and listened. In the end the students' different songs became an album. Something I have used myself sometimes is a 1-8 system, built on the places of the notes in the scale. There is something similar in the Swedish folk music as well as in India. For me the context becomes much clearer with numbers than with letters.

Do not/be careful with:

- Notes, especially note reading connected to playing.
- Theory connected to actively playing.
- Theoretical reasoning without visual support.
- Demand automation and using notes as a means.
- Sight reading combined with demands of some kind.
- Demand that music be read in front of others.
- Overhead sheets with song lyrics. Always count on there being students with dyslexia in every class and that all students will then probably not have time to read from the lyrics and sing along.
- Demand that students learn lyrics off by heart.
- Oral instructions containing compressed facts and spatial instructions.
- Grip tablets and different kinds of schedules requiring flat decoding. Giving complementary explanation can make things easier when it comes to directions and different interpretations.
- Stress which makes note reading difficult. Reading alone during an indefinite amount of time is to be preferred (Miles and Westcombe, p. 20 and 56).
- Square, fixed or stuck reasoning and thought patterns.

Do/use and explore:

- The chance to let the student develop "their" primary approach to music making.
- Playing by ear, built on the sound – the "pure" aural skills.
- "Direct playing", from musical thought, idea or sound directly to playing. Free from flat information such as music theory.
- "Free playing", as it makes it easier not to get stuck in theory. It is also free from flat information.
- Work with one element at a time and isolate different approaches. This provides a greater opportunity to discover, isolate, clarify and understand problems.
- Creation, expression and feeling. Using these in the education from the start.
- The whole, start with a holistic approach to then move downwards to the details. This to facilitate positioning and context.
- Start with "bigger" as a base. Think bigger and from different directions. There are many ways to approach an element.
- Making reading as easy as possible. The further apart the information is, the easier it is to interpret.
- Understanding and reasoning around the content as support when learning lyrics. Use different ways of learning the same text such as using pure aural skills and copying, images, movements and so on.

- Rooting in understanding and context such as images, stories and feelings.
- The use of direct information such as graphics, color, form, size, distance and more, to make the content clearer.
- Using direct signs as support as well, rather than just learned symbols, in order to make things easier.
- Instead of using the concepts of right and left it can help to show the connection between sound and action – to use different senses (Carver).
- Imagination and creativity, play and improvise using images, feelings, environments, phenomena and things as a base. There are no limits.
- Play with thought, create visual rooms, musical journeys in the mind.
- Make things easier by creating images built from context and understanding around flat symbolic information in music-theoretical contexts. This is to facilitate the ”translation”.
- ”Flatten”. Flatten theoretical contexts such as the circle of fifths.
- Rhymes including for instance note names, which have helped me a lot.
- Step away from “learning” and automation and instead start with what the student already has.

Findings with concrete music-pedagogical implications

From the literature I have read, the results of the interviews and my own experience I have concluded that there are problems with note reading. The consequences of these problems make the questioning of notes as a means valid. There exist better suited means for the purpose. See the list above.

To all teachers

I would like to finish this part on pedagogy with an appeal to schools and teachers. We have an enormous power to affect other peoples’ lives, attitudes and frames of reference. Sadly dyslexia most often also brings with it a lack of self confidence. This is not something that should be blamed on dyslexia itself but rather on the harsh climate that you spend a lot of time in as a dyslexic in today’s school. If you try to put yourself in the shoes of a dyslexic you can probably understand what I am talking about. A lot of energy, patience and will are necessary to be able to get through this passage using only the means and approaches most often provided. It is not the goal, knowledge, in itself that causes problems but rather the means that are used. Today there is an almost excessive focus on reading and writing as means, approaches that are also very highly valued. This is evident not only in the means - the ways of teaching and working in the school of today - but also to a large extent in our whole society. In school your reading and writing abilities are (often subconsciously) evaluated in almost all subjects. You can even be dependent on these ways of learning to get a higher grade in practical subjects. It is important to remember that the tools reading and writing are just two of all the ways to take in and pass on information. I feel in this area, as I do in the area of music, that it is wrong to use reading and writing as a means if these cause problems. If the goal with the task is to develop your reading and writing this is what you should do. If the goal is to take in knowledge or express yourself and so on there are other more effective and appropriate ways and means for dyslexics. To constantly be forced into a system and way

of thinking that is against your nature can be perceived as extremely taxing and cause a lot of pressure.

I find that one could question the phrase ”unexpected…in relationship to….the provision of effective classroom instruction” in the definition of dyslexia by The International Dyslexia Association, which can be found in its entirety in the background. Can teaching be effective if it does not provide results in the form of learning? With whom does the problem then lie?

It is important for the teacher to be clear from the start and talk about what this means for the student him/herself and his/her surroundings. At the same time you have to prepare the student for a life where reading as a means is not the obvious approach. It is important to also teach other approaches. This from a democratic standpoint, as well, so that the individual knows where he or she can find knowledge and information in other ways.

My view is that the most important job of the schools is to prepare the child for its adult life and give it the necessary tools. The most important tools in my eyes are a sense of self worth and self confidence which can work as a platform to stand on, to facilitate choices and to improve the ability to give and receive in your environment. With a low sense of self worth it is difficult to get far and the risks of choosing the wrong path is substantial. The risk of these tools being affected negatively in school is quite great for dyslexics, something that we, who work in schools, have to be aware of and try to prevent. I am convinced that there are a lot of people who are doing a great job in this area but my own experience sadly tells me that the ignorance here is widespread. The will exists, but not always the practical understanding, which I can understand to a degree. I do not want to blame anyone, simply to clarify things and spread awareness. A diagnose has no value if you do not know how to deal with the information that has been gathered.

I want to end with the words of Piaget: ”When you teach a child something, you take away forever his chance of discovering it for himself”
Jean Piaget

The way I see it we are leading or perhaps even forcing children into a certain thought pattern, for instance when it comes to learning to read and partly in music teaching as well. If these ways are not natural for the children or adapted to the way some of them normally think and work, this could cause two main scenarios or risks. Firstly the individual can experience confusion, and see the approach as ineffective, as though he/she is taking a more complicated path than necessary. Secondly the child is probably not given the room or opportunities to develop and explore his or her own natural approaches. If you are kept from this you may never get the chance to see where it could have led or the chance to experience how it feels to use your optimal approach and way of working. Perhaps something is lost because of this. It is worth reflecting on.

Discussion

This has been a journey in many ways. Most of all it has been very long, but also very exciting, interesting, fun and demanding. The uniqueness of describing in written form why writing is not actually suited to my way of working has sometimes been tangible. It has "physically" been one of the hardest things I have ever done. Climbing Kilimanjaro proved, in the last moment, to be physically impossible, this was only almost impossible. You have to realize your limitations, in both these cases of a physical kind, something I have done. At "Kili" (the Royal College of Music in Stockholm) this was also obvious and understandable to others. In this case, with the thesis, it has not been as easy for the people in my surroundings to understand or accept these limitations. I have never before met such a tangible lack of understanding as I have now, at a university level, contrary to my belief that there would be resources and knowledge here. Some exceptions do however exist, of course. I hope that by having done this work I will be able to lead this development forward, towards increased understanding and acceptance of these limitations. My limitations are not based in the actual writing and its expression, but rather in its processing and handing, something that has been clear to me as I have done this work.

What I wanted to investigate was if more people experience music and music making the way I do or have done. I wanted to find out if there were general similarities, difficulties and advantages, and if my own hunches and reflections were correct. What I concluded was that they were. The things I suspected about note reading and aural skills have to a large degree been confirmed. Certain information surprised me as it conformed to such an extent to my own experiences. This is particularly true of the feelings: the basic experience of feeling excluded or even stupid in some situations and in other situations feeling an ease and certainty in handling and analyzing the situation.

The portrayal of dyslexia in research and literature

There is a great focus on the "problem areas" when dyslexia is portrayed today. A great deal of the research that has been done has dealt with the difficulties and problems that you face in literary areas as a dyslexic. This might not be strange but it is still a great shame. I feel that the subject is seldom approached from a wider perspective. I do however feel that it is important to look at this bigger picture and try to get the whole picture of what this issue might be about. When it comes to the literature I also see a certain difference in opinion depending on who is discussing the issue. One thing that seems to make a difference is whether or not the authors of the books have dyslexia themselves. Two of the books I have read have been written by people with dyslexia. In these books I feel that the issue has been addressed from this more comprehensive view. The question is what causes this division and these different ways of looking at the issue. A few times I have experienced a belittling attitude from a more "educated" person within the area, during a discussion on dyslexia. This

is a shame and again points to the lack of knowledge that exists today. I believe that there would be a lot to gain from cooperating more on this issue. This could lead to a mapping of the meaning of dyslexia and the presentation of an idea of dyslexia that better portrays reality.

I hope that we to a larger extent learn to embrace our differences and strength and also learn to use and value them. We need to learn to treat each other more with understanding, respect, humility and acceptance. We also need to learn more about our differences so as to get away from prejudice and instead face each other with knowledge rather than fear. "The unknown" is often a result of ignorance and ignorance often leads to fear, and when we fear something it can lead to oppressing it. This fear can also lead to not daring to be or show who you are. If we instead widen our ability to treat a lot of different people well, I believe that this in the long run can lead more people to dare show who they are and the society to be able to face this. This is what I see as the main problem with dyslexia, the lack of understanding that you can face from your surroundings. I know a lot of people who feel they have to hide their dyslexia, as the people around them might not be able to handle it. In this situation you can feel as though you are at a disadvantage from the start and so have more to prove. This is also true in schools and for teachers. They have accepted dyslexia but lack practical understanding. That is why it is important to work from both directions in order to get further with the "dyslexia stamp". Firstly, the research needs to expand its area of research, which oddly enough has not been done yet, and secondly, people who are dyslexic themselves need to dare stand by this to a larger degree in a context where it might be relevant. Especially in the context of being a role model.

One of the reasons I started by presenting a number of people from different contexts who have dyslexia as their common denominator, was to make the issue more concrete. This can be a way of taking dyslexia from its pigeon-hole as a negative condition and show the people behind. This to reduce the prejudice about what kind of people have dyslexia and in that way possibly be able to change peoples' view of the subject slightly. I feel it is important to, through these role models, show school children with dyslexia that they are not "doomed" in any way, something I can imagine they might feel in that environment in periods. To show them that dyslexics exist in all areas and professions. To know as an eleven-year-old girl in grade five that Orlando Bloom thinks in a similar way, can probably provide a little strength to help you make it through school. I hope that the image of dyslexia will change in the future, and that all those who were humiliated through the years will get some justice and an apology. I also hope that the lack of self confidence which often follows as a result of the way people treat you, will disappear as a "co-symptom". I wish, as stated, that the whole picture be known and respected, and that the probable causes of the problems become accepted. Most of all I wish that the great advantages, which as it is are often forgotten or ignored, are included in the picture, valued and made into common knowledge. I do not hope as Juha Kere said that in 100 years there will be a medicine to cure dyslexia (Kere, 2007), but rather that the environment and our society become "cured" from their square way of looking at things and to an extent from its narrow-mindedness so as learn to handle the creativity and flow of ideas that need an outlet.

Music

Considering the relationship between music and dyslexia I am quite convinced that a great deal of music makers today could have dyslexia. This is of course not relevant or important information in most contexts but in my experience there is a problem in our society when it comes to daring to "come out of the closet", something I have already touched upon. Several known and successful musicians turned down the offer to participate in this work, perhaps for this reason. In the book by Miles and Westcombe, few of the musicians that had "made it" had the courage to use their real names, fearing that it might affect their careers. I feel that this is a problem, it can signal that dyslexia is something negative that you do not dare stand for and perhaps are even ashamed of. I think it is important to show how many among us that have this problem as well as these advantages, so as to provide more efficient help, make more people aware of the meaning of dyslexia and minimize prejudice. Dyslexia is not something that is extremely odd and something to make a big deal out of. I want to "normalize" it at the same time as I want to spread awareness of the fact that it has an impact on the world of music, an impact that is important to know about.

Something that hit me during the interviews concerning self image was the often crass and faulty idea of dyslexia as a phenomenon that the informants had themselves. The information and knowledge concerning dyslexia are sometimes so small and odd that it is scares me. The image an individual with dyslexia has of this condition and its implications is of course of great importance to the person in question. For instance the idea of "having something wrong with your head" has been brought up during the interviews. I would like to clarify concepts such as "self-fulfilling prophecy" here. The way I see it, self-confidence is to a large degree affected by the image you have of yourself. As a dyslexic it is important to receive the "right" information in order to get a fair view of yourself.

One of the ideas with this work was to not only shed a light on the immense role that reading and writing have in our society but also to emphasize the involvement of the "literary area" in the area of music. It might seem perfectly normal that the music world reflects the society in general but the question is if this is something we do consciously, to such an extent. To me it seems that the written language of music, notes, have a big role in music making in "our" culture today, perhaps more than was intended? This is important to know, especially considering us dyslexics but also in general. Dyslexics are not the only ones to struggle with note reading and many quit as they grow tired of this so often thoroughgoing note reading. This is something I have discussed with others as well. The idea that note reading is overrepresented is something I have noted in many instances, as well as a negative approach to this. Anna Engbom, a teacher at the University of Linköping, has for a long time claimed that this focus exists and grew tired of this during her music education at the Royal College of Music in Stockholm. She also states that this subject is quite taboo. This "note trend" is of course partly a tradition but it is not that old after all. Before the seventeenth century you were not seen as a "real" musician if you could not embellish and improvise as a musician in the classical field (M. Schlyter, lecture on methodology, 2007), the area where I feel that this focus is strongest today. At that time what is now called the "classical music" was also built on improvisation and aural skills (www.klingfors.com/Bach). Today for instance not a lot of people improvise their cadenza, this too is written down in notes.

It is important not to forget that this is a question of music and that writing notes is just a way of preserving the music and making it accessible to more people. Notes are one way of doing

this, but definitely not the only or the most important way. I sometimes feel that this is how our society thinks of them however. The superior status of notes does not necessarily need to be interpreted as something negative, but as stated it is important that we are aware of this dominance. I sometimes feel that playing by ear is a somewhat less valued ability and that this music ranks below music that is learned from notes when it comes to status. This is an attitude that I have felt "up close" on several occasions, mainly from music-pedagogues. This phenomenon was also discussed during one of the interviews. Lilliestam also talks about our western way of thinking about music as extremely centered around notes. He writes that we think music in notes and that music is not taken seriously if it is not written down (Andersson, Ulrika, 2004). Writing, something that you might not connect to the aural music at first sight, has a key significance. A lot of focus is put on note reading within instrument teaching, something I think is important to be aware of, as mentioned before. There are children who are hindered in their music making because of the way people, or sometimes just a few pedagogues, have "chosen" that music should be learned and played. I have often seen music teaching and above all instrument teaching as incredibly note bound. The danger with this kind of teaching is that you completely lose your aural skills, something I have seen happen with students. Despite having come quite far when they play by notes a lot of people have not reached the same level when they play by ear. This can cause you to become incredibly limited when you play, you become unable to copy or just "tag along" in the music. This lost ability in the area also limits your ability to continue with the music on your own, to extract a melody from for instance a record.

Our rather limited and narrow way of looking at music making, with focus on theory and writing is something that is particularly obvious when you study music in other cultures and other parts of the world. In my case this in many ways strengthening realization and encounter with this different way of approaching music (from what I was used to) happened in different places in Africa, mainly at the University of Cape Town College of Music in South Africa. Here the aural skills, the "swing", the rhythm, the collaboration and the cooperation in musical patterns are of great importance in the traditional music – an approach that for me is positive and well suited.

I miss in our culture a spontaneity which I feel I see in for instance certain African music south of the Sahara. There are rules and traditions in these styles of music as well but I also felt that there was an obvious place for a person's own musicality stemming from the person herself and her own spontaneity. This freedom and room in music for the internal musicality and impulses of a person are things I can miss in parts of our Western European music. Would things have been different if the African black music which is not connected to notes, such as the South African, for instance Xhosa, had not been opposed and repressed by white bearers of tradition? Would the tradition of playing by ear have been stronger had it been allowed to develop in peace?

The folk music tradition in Sweden is an important exception from what I have stated previously. Here the notes do not have such a central position and you use listening as the tool it actually is. I believe the great deal of musicality I can sometimes experience in this genre has to do with this listening approach and its central position in music making.

The "reign of the notes" is something I would like to see changed, partly so that a greater musical diversity could be allowed and let out but also for those who for different reasons prefer to play more by ear. The aural skills would then be valued equally and be "permitted" to the same extent. It would enrich our musical society and to degree make it accessible for

more people, among others those with dyslexia. I feel it is more important in our system that musical people are welcome and cannot be excluded in any way, than that good readers should be prioritized. To take this reasoning to its limit I sometimes feel that, the way things are today, people can get quite far within music without having to be “musical” people to the same extent. That you may sometimes not need to use any musical ability as you can get quite far simply by being a good reader, also in the music field.

Further research

Research I would like to see done in the future, by me or someone else, is the following:

Further investigate more closely how methodology in note and music teaching works more generally and see if the method based on ”sounding” is the one normally used, which I believe.

According to Bovin (personal communication -07) there was a method for learning to read used in Sweden during the forties which could be good for people with dyslexic problems. In what way could this benefit dyslexics and is there something in this method that could also be used when teaching notes?

The “whole language-method” is probably also one that could be used in note reading and its education. Could this method in New Zeeland also have spread to the note reading methodology there, as was probably the case in Sweden? It would be very interesting to go there and investigate how they approach this element in their music teaching. Do they have different strategies that cause note reading to work better for people with dyslexia?

Carry out practical tests to be able to ascertain and compare concrete data concerning the relationship between dyslexia and musical strengths and weaknesses in a more scientific way. Compare dyslexic musicians with non-dyslexic musicians.

Investigate the pedagogy that informant nine was exposed to when playing the piano as a child. Could this in some way differ from the other informants’ and many other dyslexics’ education in regards to notes?

This time I did not touch on the subject of music creation during the interviews. It would be interesting to hear how the informants think about the subject and if it is something that is central to them, something I suspect that creating music would be if they received the correct support when it comes to their creativity.

Cause and effect - what really came first, the difficulties with of the advantages of dyslexia? Could it be that the difficulties are a consequence of the advantages? This would be interesting - given that those who do the research would dare investigate and focus on that question.

I would also like to do an investigation into the ability to decode whole words in general. For instance let the subjects read the form of different paragraphs through matching the ones that are similar. Then compare the results of the dyslexics and the non-dyslexics.

My plan is also to develop a music-pedagogy which to a greater extent fits people with dyslexia. To have a whole methodology based on aural skills which is free from theory and at the same time teach notes in a way that is completely based on direct information, graphic decoding and whole-word decoding. This approach would not be based on "sounding" with one note at a time but rather start directly with images and unit-reading based on the image seeing.

Problematization of my work

The problem areas I can see in my work and the things I maybe would have changed or examined closer looking back with the knowledge I now have of the subject, are described below.

The difference regarding note reading versus text reading that informant nine shows in comparison with the other informants. The questions used during the interviews also had a wide range. For more informative answers that would have been easier to handle, the areas should have been narrowed down. This could however have caused some information to be lost or cause it never to have been brought up in the first place. In the interview responses things like self-knowledge, self-confidence, experience, frames of reference also matter. Previous knowledge/empirism of the musical concepts I brought up also played an important part. I can here never know exactly what the informants mean and feel.

The puzzle of dyslexia has not been solved scientifically. The background and causes of dyslexia are still uncertain. A lot of different ideas exist, which can cause difficulties in presenting a short and accurate presentation of the issue. I also have difficulties being entirely objective, as I have dyslexia myself. This could result in me jumping to conclusions or being unclear because of how certain things seem obvious to me that are not obvious to others. Non-dyslexics could have trouble following my line of reasoning.

Problems concerning the separation of facts and reflections could appear, as I myself am a kind of source. I also include my own reasoning and theories, which I feel are important to include, at the same time as I do not want to present something that is not quite correct. I feel it is difficult - the research that has been done is narrow and even from my point of view skewed, lacking the holistic perspective. What is more, research on certain areas is practically nonexistent, such as when it comes to the positive sides and creativity that is mentioned. If the research had been done from different angles more information would have appeared added to the picture of dyslexia.

It is difficult to be general; dyslexics are so different from each other. Our narrow view on music-pedagogy and its approaches cause problems for dyslexics, problems that are not of a musical sort. There are of course non-musical dyslexics as well, but these are not included in my work.

I could have looked closer at to what extent the size of the brain affects the ability to think – if the increase in size of the right hemisphere does indeed affect thinking to the extent that I assume it does, as do Kere and Finer (2008).

Perhaps the ending of ”*Dyslexia according to me*” can be perceived as overly jaunty, pretentious and positive but I would defend myself by saying that you have to be allowed to encourage your fellow men a little.

And one last thought…

Names and categorizations of people are a reflection of the time and society you live in. Our time and our society, is very centered around literacy and we have a clear focus on reading and writing as a means – hence *dyslexics* have appeared. The concept of dyslexia reflects the society we live in and the abilities that are valued right now. Knowledge of handcraft and creation is not valued as highly today. During the middle ages, when professions of craft were more common and more “important”, there were probably names for people who were not handy or practical, and these were not dyslexics (considering our creativity, inventiveness and ability to create). A disability like dyslexia is solely based in the environment. I feel that the name dyslexia in a way can be misleading and not tell the whole truth. *Image-thinker* would be a more appropriate name which to a larger degree includes the whole picture.

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Interview questions

Below follows the framework with the interview topics as well as questions and areas that I used and brought up during the interviews:

Instrument, short musical background
Perceived dyslexic problems, to be able to for instance draw parallels; reading – note reading.

Do you feel that your dyslexia has had an impact on your music making?
If yes, in which way – positive or negative?

How do you use/perceive the following:

- Note reading, (sight reading[2], at a high pace, several systems). Would you prefer another way?

- Playing chords.

- Aural skills, (ability to memorize, easy/hard).

Do you feel that your inner musical image is different depending on whether or not you learn the music through notes?

How does your inner musical image look when you use your aural skills, do pictures pop up, notes in your head…?

- Ability to improvise.

- Ability to memorize text? How do you do it?

Do you feel that the theory (notes, diatonic funcion[3], rules) has a central place in your musical reality? How much do you refer to/use this?

Do you feel that you are different from ”non-dyslexics” in your musicality/the way you make music, have you experienced any differences? If yes, which?

[2] Concept explanation: Playing directly from notes, without prior understanding. “Raw” note reading. You read and play at the same time without having prior knowledge of the piece. A situation where you are particularly dependent on your note-reading ability.
[3] Concept explanation: a music-theoretical way of analyzing the relationships between the notes or between the chords.

What do you feel are your strongest and your weakest sides musically?

Why did you decide to opt for music/what drew you to music? What appealed to you the most?

How did you get past possible problems?

The interviews are structured as follows:

Informant number:
Gender:
Age:
Pursuit/occupation:
Main instrument:
Dyslexic problems:
Diagnosis:
Interview date:

1. The effect of dyslexia; do you feel that your dyslexia affects your music making in any way?

2. Note reading:

3. Playing chords:

4. Music theory:

5. Aural skills:

6. Improvisation:

7. Expression and feeling:

8. Text; the ability to memorize lyrics:

9. Approach; learning:

10. More:

Summary of the interviews

Interview subject one

Gender: Female
Age: Between 20-35 years old.
Pursuit/Occupation: Student at the Royal College of Music in Stockholm, studying teaching, year one.
Main instrument(s): Song
Dyslexic problems: Slow reading, difficulties when changing lines and with suffixes.
Diagnosis: Two years before the interview.
Interview date: February 7, 2007

1. Yes, both positive and negative

2. Difficulties when using several note systems at once, when changing lines and certain recognition of a recurring note. She describes not being able to quite get a grip on the system with notes. She actually knows it but playing the piano she sometimes gets confused. "I see what it says but to translate it from the paper, in to my body and out through my hands – sometimes the connection just does not work. Just as when you lose a word, it is on the tip of your tongue, almost about to come out but then it disappears – I can feel like that". The translation process between notes and music (hands/playing).

Sight reading works in song when she ignores the names of the notes and only uses the interval information[4]. Difficulties do arise however when she needs to change note system, then she does not know on what note to start as she does not see the distance between the previous note. When playing the piano she always prefers a slow pace when sight reading. She does not look naturally at the notes but tries to. She knows where in the notes she is. She describes never seeing notes in her mind. She feels she has yet to figure out a good way of approaching the notes, as not having found "her way" at all.

3. Playing chords is seen as easier than notes but takes a bit of thought when she has to change her grip and receive instructions, but she does not feel that she has more problems with this than others. She can have problems receiving oral instructions. The chords are in her fingers and motor skills.

4. She is not very used to theory, says that she has not studied this before. Is "discovering" it now at college. It is moving along slowly but this could be a result of not being used to it. It takes longer for her to understand and she has difficulties getting a grip on certain things, within many areas. Sometimes needs to receive written instructions explained in other words, in another way. Refers to intervals and chord notes in for instance vocal harmonies she hears, but not to diatonic functions and cadences.

[4] The distance between the notes.

5. Aural skills and ability to memorize are her security. She leans against these abilities. She finds it easy to copy, as she did as a child as well, before being aware of notes. She has old cassette tapes of herself from that time. She looked at and copied the piano teacher as a child. On this level she made it through by using her aural skills, playing by ear was enough. She practiced a lot and asked her father who is a piano teacher, to play her homework so that she got to hear it again. She could understand it, using counting as an aid – but it took time. The things she learns by ear sticks longer and better, piano homework via notes quickly disappears from her mind. She feels this is a compensatory ability, but also says that it was there from the start.

6. Her ability to improvise is good, better than most peoples'. It is easy for her to improvise, make harmonies, just "go along" with the music, express musical feeling and embellish a song.

7. She has been told by teachers that she plays well and in a musical fashion. Has a good musical sense.

8. No trouble learning lyrics.

9. - Aural skills.
- Uses one hand at a time when learning the piano, listens and plays to the other recorded harmony.
- Motor skills, teaches the hands how to play. The chords are in the fingers.
- Her own mapping of a song that she hears for instance on the radio, not when she sees it through notes however.
- Feels that she has not really found her way yet.

10. Musically she does not differ, only when it comes to letters and symbols. She feels she is not as respected, but that has a lot to do with theory. She feels that she is not able to show her full talent at college. She wishes that people like us would be more recognized. It is not considered as classy, you are not as respected, if you do not use notes a lot.

Interview subject two

Gender: Female
Age: 20-35 years old.
Pursuit/Occupation: Student at the Royal College of Music in Stockholm, studying pedagogy. Has a five year musician and diplomat education, outside of Sweden from before.
Main instrument(s): Viola, classical focus.
Dyslexic problems: Reading, reading comprehension, turns letters, writing to a certain extent, spelling.
Diagnosis: As an adult studying Swedish at Komvux, (municipal adult education).
Interview date: February 19, 2007

1. Big impact, both positive and negative

2. Negative regarding note reading. She often felt stupid and guilty for having trouble with notes before discovering that she had dyslexia. Became nervous and blocked when sight

reading, even if the piece was “easy”. Much easier at a slow pace. She believes she takes one thing at a time when reading notes, but she thinks it can vary which she does first. If the rhythm is difficult she might take the pitch first and vice versa. The easiest first. This is what separates you from other musicians, the obstacles in note reading and all the embarrassing moments these result in, especially when sight reading. You are so focused on the reading that you can sometimes play without oomph, like a child. In these situations she becomes very stressed and feels that she is further from the music than the others. It takes her longer to get ”into” the music, but when she is there she is really there. The notes will never really become automated. They caused her trouble as a child, but she loves music. She wants to get away from notes as quickly as possible.

Her note reading is sometimes blocked. She only uses notes as an aid, but they do not really help. She feels a lot of stress and anxiety and gets headaches in situations where she has to read notes under pressure. She feels this is embarrassing. It is impossible to memorize a whole Beethoven- symphony in 15 days, in such situations you have to use notes to aid your memory, especially if you are not doing the melody or have for instance long notes or repeated patterns. When she plays as a soloist she never has notes in front of her. She would prefer to learn the piece by ear, without the notes, especially when she plays as a soloist.

The piano is really difficult, it is very hard to have several systems. She thinks the pitch graphically.

3. Chord notes and symbols are not a problem. It is easier than via written notes. The piano is difficult, it is very hard to have several systems. She copies.

4. She uses music theory when learning music written in notes, so as to get away from notes as quickly as possible (see nine). She uses theory a lot and uses it as an aid. She sees the music as a whole, as an image, through this.

5. She has not trained her aural skills very much, always used notes as a base. Uses it very little but believes that it would simplify things to learn pieces by ear. She also thinks she would prefer it, if it were possible. She also imagines that this is something that applies not only to dyslexics, that everyone would prefer to learn using their aural skills. She practices to CDs. The music sticks better if she learnt it by ear rather than from notes.

She does not feel this is more difficult for her than for others, rather the other way around – on those occasions when she has played by ear. She has been told that she has cheated when she has copied the teacher. When playing by ear, improvising with the class she was the only one who was not nervous. She felt it was great to play without notes.

She said yes when I asked if she believes it would be faster and easier to create inner images if she learned through her aural skills. She is however unsure of whether this kind of teaching would be practically possible. It is difficult to have time to hear all the fast passages from a CD. This could however be a question of training. When I suggest a kind of data program/system in which you could listen to the piece or just one harmony and control the pace to better be able to hear certain fast passages, she is very positive. She describes how she for instance as a soloist would prefer to have learnt the piece by ear if possible.

6. Believes she feels improvising is easier than others.

7. Her strength is playing musically, emotionally. This is something she receives praise for and is a reason for certain musical co-operations. She feels this could be a compensatory ability to a certain degree. She also describes being good at following the conductor's directives and gestures.

8. -

9. The approaches she uses are slow note reading when she is alone and not under pressure. First the notes without the instruments, one thing at a time, and the easiest first, in note reading as well. She imagines and thinks the music in images, stories and as movies. She memorizes these images. Her memory is good and so she memorizes the music. She copies.

The whole learning process:
What is positive is the memory. She quickly learns to remember in order not to have to read. She also memorizes music, learns it off by heard with the notes as a base. First she only looks at the notes and imagines how the music sounds, gains a musical image through her internal listening. Then she picks up the instrument, does a phrase, adds a little... and in the end the whole piece. When the internal notes are clear – how the music sounds – she uses theory in her memorization, which chords the notes are a part of, triads… This helps her get away from having to read the individual notes, instead she knows in which chord she is. She wants to get away from the notes as quickly as possible. When I ask her how she thinks the music she responds that she thinks it in images and stories. She imagines something outside the music. She sings the beginning of a piece with a melody that rises step by step with a frequency-like feel. Here she imagines a mountain, then a higher mountain and an even higher mountain… The character and feeling need to be a part of the images and she finds herself in this environment, climbs the mountains… it is like a movie. She trains and makes a story in and from and in the music. She states that if she does not think about that feeling but just the notes she becomes really nervous.

10. The love of music is what drew her to it, despite adversities. The problems concern learning. She has yet to find the perfect way to learn the music, it takes a long time.

She feels sight reading in groups in front of each other is wrong. It is like normal reading out loud, the teachers should not demand it. As a dyslexic you should be allowed to take the notes home beforehand and be allowed to look at them home first – then you will not be as vulnerable in the situation.

Interview subject three

Gender: Male
Age: 20-35 years old.
Pursuit/Occupation: Teacher student at the Royal College of Music in Stockholm, year one.
Main instrument(s): Guitar, self taught to a large extent, started in school year six or seven.
Dyslexic problems: Reads slowly and has always felt that he had difficulties with writing, which has required a lot of time and concentration, without giving that great results. He also has problems with spelling.
Diagnosis: Coming
Interview date: March 8, 2007

1. Yes, both a positive and a negative impact.

2. The difficulties with notes, especially note writing is what is negative. He has used notes for a long time and a lot in school and with choirs but he still feels he is “terrible” at music theory. He cannot quite work it out and when he needs to write notes he often ends up on the wrong line. He also confuses different clefs, keys and so on when he writes notes.

His note reading ability is varied. When it comes to singing he has sung from notes for a very long time and feels that this works quite well. When it comes to the guitar he has not played notes as much and has not played at all for as long, so in that area note reading does not work as well. He feels these problems can have to do with not having practiced as much, but perhaps with dyslexia as well. He feels that there is a great difference between singing and playing from notes. When playing he can easily make mistakes, read the wrong note for instance, and get stuck. Somehow it feels like you are going backwards when playing. Melodies and intervals are quite easy but when there are many notes in several systems or you use written chords it becomes more difficult. He feels that the temporal aspect has a certain impact when reading notes. It can be easier at a slower pace and his chance of getting it right is then greater, but if the pace is too slow it can also be easy to lose focus. He tries play at some kind of medium pace. When he had to learn a classical piano piece for instance he went home and learned it off by heart. He could not play it via notes so learning it by heart was his only way of learning it. The notes did not serve as an aid or support while playing. He never sees note in his mind. Counting whole and half notes with the names of the notes can take quite a while. He uses a mental image of a guitar neck and the grips of the notes as an aid, and sometimes draws this as well. Music that he is to learn from notes are transformed into music learned through aural skills. He has to learn it off by heart, that way, or he cannot learn it at all.

3. Chord names are not really a problem in themselves but he feels that he can sometimes lose them on the paper and read the wrong line. He feels that playing the chord names is easier than chords written in notes. The written chord names can serve as an aid with special chords or a lot of changes in chords but normally he uses his aural skills and improvisation. He feels it is much easier to use only aural skills, to learn simply through listening to the song and playing along.

4. When I ask if he feels that music theory has a central place in his musical reality he answers quite firmly no. He understands it and knows it but does not use it naturally when he thinks. He sometimes finds it difficult to see connections through theory only, something he is trying and wants to get better at. A group of notes can for instance be harder to understand on paper than if he hears them. The connections are not always as clear to him in theory as they are when he uses his aural skills. This is something that he has thought about; whether it might have something to do with his dyslexia. Theory connected to aural skills is perceived as difficult because of the theory. He is at the same musical level as the others, except when it comes to the theory. He is at an advanced level. He also states that some of the teachers he has had in music theory would believe that he plays at the level he does with the musicians he plays with.

He experiences this as a gap. He already has musicality that it takes a long time for others to achieve but is behind when it comes to the theory.

He talks about theory as his weak side; theory, harmony, the circle of fifths - everything that has anything to do with it. Another example are notes on the guitar that require you to "build stuff", for example: there is a C# which is a part of it. When he is playing the guitar he does not think about the names of the notes he is playing.

5. He describes aural skills as his strongest side, the ability to simple "go along" in musical contexts. He has always had good aural skills and he believes that the dyslexia has had an impact here. He thinks that it is a question of different kinds of intelligences. He connects this to a course in developmental psychology that he has taken where they have read about people who are "awesome at something" but have almost no abilities when it comes to another kind of intelligence. He also believes that this is a question of compensation. His aural skills are a great asset to him which has led him to be able to play a lot and with good people as well as be sought after. In other words – things are going well.

He participates in the fastest group when it comes to his education at the college (year one). He feels his aural skills are good but when they are connected to theory things become more difficult. He almost only plays by ear, by listening to recordings and learning to play that way. He has noticed that others often only want the chords, he would much rather only use the recordings. Using only his aural skills is an approach he uses quite a lot these days. He believes his aural skills have been so good to compensate when the dyslexia gets in the way.

He feels material that has been learned through aural skills sticks better than if he has learned it through notes. He says that choir music, which he has sung from notes, would have stuck better if he had sung and learned it by ear. He is able to play anything, as long as he knows how it sounds, which he has noticed that others cannot.

6. He finds it easy to improvise and "tag along". When he improvises he can use notes as a sketch of the form of the song, as an aid.

7. When I ask him if he feels that he differs in some way from other musicians and their music making he tells me about two of the people he plays with. A pianist he plays with also has dyslexia. He describes feeling as though they "find each other" very easily in the music. He feels as though they think in a similar way around feeling, dynamics and so on, but also theory. For instance they both have the need to count the distance between notes. When playing with another person (without dyslexia) he almost feels as though problems can arise. He describes this person as very "mathematical and so on". He is not sure if this is connected to dyslexia but sometimes he suspects so. People can be very stuck in the idea that you always just need to understand everything theoretically and everything else will be explained. He himself feels that it is more a question of feeling and nuances. He feels that the cooperation with the mathematical musician also works very well as they complement each other in a good way. The person is good at theory but has issues with playing by ear and just "going along" with the music. They usually say that together they would form the perfect musician. Pedagogically the music and the feeling that it is all about are always there, regardless of the level (see further information under question ten).

8. He describes his ability to memorize text as "extremely bad". He has difficulties learning lyrics off by heart and feels he is lacking a good way of doing this. He says that this probably also has to do with not being good at "studying". He feels he has not gone over the issues enough times and states that laziness is also a part of the picture. He feels he lacks good study techniques and has yet to find ways of taking in information of this kind.

9. The ear, the aural skills; listening and learning in that way.

10. He discovered music-pedagogy during his time at the folk high school and wanted to work more with it. This has worked out. His entrance exam also went well, although it was uneven - his theory exam went badly. He thinks he is pedagogical and feels that this often comes naturally. He has a musical idea. He feels he has discovered different basic approaches. Someone told him that until you learn the instrument it is only a question of discipline. He feels that it is always music, regardless of at what level it is and how technically difficult it is. It is already there from the start. The musicality is always there, it is a question of feeling… He wants to make music. People are probably different and no approach is wrong.

Interview subject four

Gender: Male
Age: 20-35 years old.
Pursuit/Occupation: Other, amateur musician.
Main instrument(s): Trumpet at the Communal School of Music from age twelve, before then recorder from age seven, guitar from age ten. Trumpet then became the only thing he played and he was active until he was 20 years old. He also played a lot in orchestras from the age of twelve, up to five different orchestras a week.
Dyslexic problems: Slow reading speed, at the level of a twelve year old. No real problems with writing.
Diagnosis: Received his diagnosis two years ago when beginning to study at university and realizing he was not able to keep up with the reading. He failed all the exams until this was discovered and dyslexia became the answer, something he also strongly suspected himself.
Interview date: March 9 2007

1. He feels it is difficult to answer this. He can feel it is difficult to play at a fast pace as he is a note reader, which is the technique he uses. He is trained in a classic manner and does not play by ear or similar.

2. His note reading works quite well, it is easier when the notes are on the note lines and a bit difficult when they are outside, on the support lines. In these situations he might need to use his motor memory. After thinking about it he says that he has had some difficulties with notes. He feels these get worse during fast paced passages. He states that in those cases he hammers in the information so that it is in his head instead. This states that he is aware of what is coming which makes it easier to follow the conductor. He states that dyslexia could be involved in this. In general he makes sure he knows the music well enough so that it is enough to see the notes and then know the sound through his motor memory as well. He describes this as a kind of learning by heart. He also uses recognition. Because of the notes he starts by playing slowly. On the question of what is his weakest musical side he answers note reading; "getting the notes into my fingers". He avoids sight reading. If he were asked to sight read he would respond "sure, but in a week maybe". In this area he needs more time, although it depends on the difficulty of the piece. Harder notes mean a bigger challenge. The strategy he would use is a slow pace. He always starts with the rhythm which then helps the flow with the pitch. The music college taught this technique.

3. -

4. He does not have very much experience of music theory. He has never studied theory and so finds it difficult to express an opinion on the subject.

5. Aural skills: He feels he is a note-person, and has bad aural skills. He is able to copy if he is given a note to start with. His ability to learn by heart from notes is quite good, something he uses. A sounding B flat major scale usually works well. He "gets the notes into his fingers". It takes a long time to learn music from notes. The music sticks and stays for a long time when he has learned it, but he probably practices more than most.

6.-

7.-

8. He feels that it takes him a long time to learn the lyrics by heart. Lyrics are easier than "normal text" as it is connected to the music, however. In a choir situation when the melody reading and text reading might need to be done at the same time he focuses mainly on the melody and only secondarily on the text. He can also want to just look at the notes and imagine how the piece sounds before the execution.

9. The main approach he uses, that works best, is slow note reading. One thing at a time, the rhythm first. He used to practice a lot with other people outside of class, which he feels was important.

10. On the question of whether he feels that he is different from non dyslexic musicians he responds that he does not know. He can imagine that perhaps he practices more but that when it sticks it sticks. He feels his strongest musical side is the quick connection between finger technique and lip technique. That he was allowed to try so many different musical styles was something he liked a lot and was something that has made him stick to music for so long. He was part of five orchestras a week and felt it was sad that he later had to choose.

Interview subject five

Gender: Male
Age: 35 years old or more.
Pursuit/Occupation: Teacher of woodwind instrument methodology at the Royal College of Music in Stockholm. Is also/has also been a clarinet teacher at a culture school, University College of Music Education in Stockholm, the Royal College of Music in Stockholm, Södra Latin and musician at for instance Folkoperan. He started playing the clarinet at the age of nine. He has studied pedagogy as well as studied to be a musician at the Royal College of Music in Stockholm.
Main instrument(s): Clarinet.
Dyslexic problems: As a child he had bad writing and went to a lady who helped him with this, but he was declared "fixed" by the third grade. He reads slowly, like a voice in an audio book. He is faster when searching for specific words, but then does not understand the text. Spelling: when he is unsure how something is spelled he can need to write a few variations in order to see which one looks right. He confuses b, d, p and so on.
Diagnosis: As an adult, at the age of 35.
Interview date: March 12, 2007

1. Yes. He feels he has a weak sense of rhythm, which he claims that some people with dyslexia have. When reading notes it is a question of placing the rhythm, feeling the rhythm and then decoding the rhythmic and note-like symbols. Even as a child in the concert band it bothered him that the other children were so much better at reading notes than him. At the same time he practiced a lot and felt it was fun. He played much more by ear, as this was easier for him back then. This had a negative effect in the concert band however. He found it easier to remember the grips rather than get the notes to create the music. If he remembered the right grip he knew he was where he should be in the music and he describes this as the wrong way of memorizing music – through motor memory – as this creates a security in the hands as memory tools. He claims that this motor way of remembering music is negative as it does not lead anywhere. You can only get to a certain speed and there it ends abruptly, where you are unable to think faster. The way you play also becomes quite square as a lot of your energy is spent on this memorization. "Then you are unable to really make music, you have to keep track of your hands and that is not music."

Feels he has a weak sense of rhythm. He believes this is not connected to his aural skills but rather rooted in his body, but he has not reflected on this before. He finds it more difficult to memorize rhythm than pitch. And it is easier to memorize/play your harmony if you hear the melody and the chords at the same time.

2. He is completely unable to understand how some of his colleagues can sight read at the speed that they do. He does not understand how it is possible. Note reading to him does not really pose any problems as long as it goes slowly. He touches on the issue on rhythm again and describes how, if you are playing and do not have the time to perceive the notes from the note sheet you also slow down your rhythm. The rhythm, the foot, has to wait until he has finished reading and if the foot has had to wait your whole life you have probably destroyed part of your sense of rhythm. It has become so flexible, and you have let your eyes control it to such an extent that you have lost your inner "beat". He cannot say if this has to do with dyslexia or just with him.

He has always had a lot of problems with classical piano. Many of his friends with dyslexia have the same issue with playing the piano. "Grape bunches" they call certain groups of tightly packed notes that are almost illegible. Having several systems at the same time while playing the piano is very difficult. He does definitely not feel as though the notes simply "come to him" as a non-dyslexic colleague described his note reading. He has never experienced this, instead he must go out himself and solve them the whole time. He describes how some people hear the music automatically just by looking at the notes.

He reads the music first, before including the instrument. If he has learnt a passage through notes he will have forgotten the notes within a year and be left with only the music. At that point the piece is no longer any different from what he has learned directly through his aural skills. The inner image of the two is the same.

When he plays by ear he does not see any notes in his head, at that point it is just the music being played. Neither does he relate music that he hears to notes. He does however often keep the real notes in front of him as support, a way to aid his memory. This can be useful for instance when there are wide gaps.

The instrument teaching he experienced as a child was related to and designed in much the same way as the reading and writing teaching. The pedagogy was the same. The notes were important and you always had to follow them with your eyes, study them. Learn to read; ”mor ser en sol…” ”mother sees a sun” (rhymes in Swedish). His weakest musical side is note reading.

3. He feels playing chords has gone quite well, without any significant difficulties. He definitely prefers chord names to written notes. The information in chord names is so much more compact. He does not get a feel for the chords by seeing the written notes, but perhaps that would change with a lot of practice.

4. On the question of whether music theory has a central place in his musical reality he answered: no, no place at all. He never uses that kind of thinking. He knows the theory, the keys, the key signatures and so on, like the back of his hand but he does not use them very much. When he is warming up he plays all the keys after the circle of fifths several times until he does not know where he is theoretically but hears that he is where he should be and what to play. He is then focused on how it sounds, the breathing or the tongue and so the theory disappears from his mind as he lets it go, one thing at a time.

He talks about an occasion when he taught a class together with a saxophonist. He told a story to a piece of music, the children were fascinated and the music followed the plot exactly and they reinforced each other. The saxophonist only heard the harmony analysis however, and nothing else. They were in their own separate world. If too much music theory is needed he does not have time. He has to choose. If he uses the theory the images disappear and vice versa.

5. If he compares himself as a child with those who go to the music school today he can see that he knew a lot more songs off by heart. The access to notes was not as great back then either. When he then started at the music college he stopped using his aural skills and dedicated a great amount of time to trying to solve the problem with the notes. He did not at this point know that he had dyslexia, he was just set on solving it. He was entirely convinced that it had to do with his vision and he just had to overcome this, control his eyes (his girlfriend who was at this time horseback riding in Östermalm in the mornings used to drop him of at the college at 6:30 am, at which point he started practicing). He practiced endlessly. This was quite devastating for his aural skills, it was as if he turned them off, as there was no room left for them. Today his aural skills are his great strength and a great freedom – if he knows the music through aural skills there are no problems. It is here in the aural skills that the secret lies. He is very sad that he did not start working on them earlier, in another way from the start. Then he would have had more confidence in these skills, rather than “to get halfway through Ackis (the Royal College of Music in Stockholm) to then realize you are doing the wrong thing”, that you will not get further, that this system no longer works. He then had to start over, and had to trust that the aural skills worked. One summer he took the book “Sjung svenska folk” (Sing Swedish people) and played the songs in all keys in order to rid himself of the notes, remove them from before his eyes. This became the start of something new. If he could go back and change the education he received he would have liked it to include more playing by ear. If he had been able to work with pitch as the central element from the start perhaps this would have helped his note reading ability as well – made them chime a little when you saw them. He begins by playing by ear with his own students, to awaken their aural skills and the clarity of the intervals. Some are unable to do this, however, so then you have to use several senses.

His aural skills differ depending on the genre. Notes are good for playing in an ensemble, with harmonies that stay for a long time, difficult to memorize. If you will only play for instance folk music you do not really need any knowledge of notes, as that music is often built on aural skills. He feels that some people who have a talent for note reading do not have to make the effort of really learning the music through aural skills. He does not think that they have to sing the music in their heads and if you do not sing the music in your head it is no fun, he reasons, then it is just notes.

Not being able to read notes might have helped develop the other side in a very positive way. It is also possible that the creative side has become more developed as it has been an aid for him in solving problems. If you do not have problems with notes perhaps you do not even have to activate your creative side, he suggests. He believes that this side is compensatory.

6. -

7. He always thinks the music in images and tries to always portray that image as he plays. To be able to convey this he has to be in that environment which in turn means that he has to know the music entirely by ear – this way the music is better. Sometimes it can take quite a long time for the images/feelings/colors to come, he may have to play the music 20-30 times first. There can also be music that never produces images, it depends on its quality. Emotions or colors come automatically, you feel it in the body. If you then want to move on to more precise images and stories, to the next stage, you control this yourself and then use the first feeling you got as a base. With some music you do not move on to this next stage but rather let the first impression be.

He feels it is difficult to separate what is caused by him and what is caused by the dyslexia. Musical expression is easy, using all these colors and expressions is not difficult. During his time in secondary school he took a theater and drama class. The class was given the assignment of portraying a text, using an imagined environment as a base, a shelter or a meadow where there was a picnic for instance. He thought this was really exciting to work with and feels that he has a talent for this transformation of for instance environment.

To take the music and turn it into something personal is something he finds both easy and fun. He has a lot of students who are not able to do this, nor are they able to understand. If this has to do with dyslexia is something he does not know. His strongest musical side is expression

8. Song memorization: he feels he is ”completely rubbish” at learning lyrics. He never knows the lyrics, never listens to the lyrics and is never aware of their content. Even if he has learned a text a lot of times it can still suddenly disappear. He himself feels that this might be a result of a lack of interest, not dyslexia. He is never able to see a text in front of him. This could be connected to dyslexia, but no, there are a lot of people who are bad at lyrics so he does not really feel that it is applicable in this context. If he transforms the content of the text to images this helps. When he helped his son, who has dyslexia, learn the lyrics to a song once, he drew images - one for each event in the lyrics - then his son learned it instantly.

9. When it comes to learning he feels he probably prefers to learn a whole new classical piece from notes. This mostly because he can then start from the beginning when it comes to expression, as he has not heard anyone else play it. He can then build his own color from the music, without stealing anyone else’s expression. When it comes to jazz it’s a whole different

thing. He has not let go of the security in his fingers, though he would like to. There still remains a small worry that makes him afraid to let go of that security.

He memorizes the melody by playing it the way you sing a children's song without notes. You hear it in your head. He feels this is a better way of playing. When his students at Södra Latin arrive at a passage that their fingers are technically unable to handle, it is in 90 percent of the cases a question of them not hearing the exact notes in their minds, and how it should sound. If they are singing other notes in their minds than the ones on the note sheet (or none at all) a conflict is started and it turns out wrong. You have to use all your senses but the aural skills are superior.

When he learns new music he learns the rhythm and intervals first, then he adds the instrument and then the motor work. He wants an inner sound image that is strong enough that he is able to hear it exactly whenever he likes. If not he will memorize it with his fingers first, something he does not want. He wants the music to come first (see also question seven).

10. How did he then get past his difficulties with the notes? He was used to fighting and working against the odds at school so his problems within music with notes were not such a big deal. He also had a pedagogical pull. He is used to thinking pedagogically as he has always consciously been trying to find solutions for himself. His clarinet teacher did not help him so he had to find ways himself. This made it fun to teach. He has been down the wrong path himself and so feels he can analyze and see the students' problems and strengths quite easily.

Interview subject six

Gender: Male
Age: 35 years old or more.
Pursuit/Occupation: Musician, studio musician and producer.
Main instrument(s): Piano, bass, accordion, battery and trumpet (cheats a lot while playing the trumpet). He is born and raised in England in a family of professional musicians and stage people, dating back several generations on both sides. He tried taking lessons as a teenager, but it did not go so well. The teachers were - as he puts it – classical. He can today relate the problems he was having to the dyslexia, which he was unaware of at the time. He learned playing the piano on his own and, apart from a few piano and composition lessons, he deems himself to be self taught. He studied music at the Communal College of Birkagården for one semester before being offered a job as a theatre musician at Riksteatern. He also studied Jazz at the New Castle College of Art, which was highly demanding and had a vocational orientation. He has a hard time with the strategies used by schools and studied all the books entirely on his own.
Dyslexic problems: He is a fast reader, but fumbles with the content and has a hard time with remembering and repeating it exactly. Understanding written content. While writing he flips letters and compresses words and sentences. He has difficulties expressing himself in written form. He can dictate, but finds it difficult to write it down. However, he can often see if a word is misspelled.
Diagnosis: A couple of months prior to the interview. The investigation took place last fall and he recognized the mental feeling that he got during the tests from his experiences with music. The same feeling of mental pressure and not being able to keep up - that it is not working.

Interview date: Mars 5, 2007

1. His dyslexia absolutely has an impact when he is playing music. You cannot be stressed and badly rehearsed. He describes that, as far as he understands, only working with the information through the short term memory does not work. He is currently working consciously enough that the musical information transcends into the long term memory, so that he is able to hear the entire piece in his mind and skip between parts and beats. He compares this method with the classical musicians in orchestras, who do not know their parts perfectly and instead reads them. They are very adept in reading notes, which is a great asset when switching between different gigs. Would have liked to have more education, feels that other musicians without dyslexia are more educated.

2. He finds it more difficult to play two piano harmonies simultaneously than melodies versus accompaniment and a single harmony is much easier, for instance when playing the bass. He thinks the piano is a difficult instrument for a dyslexic to play, but that it is good practice, and that when playing the piano, you train yourself in this ability to interplay and to push yourself a tiny bit further all the time. He also believes that you train the coordination between right and left hemisphere when playing more difficult passages.

He can see and read how a piece sounds and is played from the symbols on the note sheet. The problems arise when he tries to play the piece from the notes and he comes to a standstill. He compares this with writing a letter where knowing what the contents of it should be is not the problem, but rather when he is to actually get it written. This aural reading is probably partly inherited and partly acquired from training, but could also be due to the dyslexia (the ability to visualize aurally, not seeing/hearing every single tone). This demands that you know the style of music/genre and that you know what it usually sounds like. It also helps if you have knowledge of how the composer writes, his or her style, and he uses this technique often.

Something he found out during the investigation is that he utilizes the same strategy when reading books. He inserts his own visualization into this, using it to fill the gaps in the text. It is also possible that he becomes stimulated to add to the text subconsciously, deepen the plot and the reasoning, and venture further into his feelings. He describes how he only reads the text to a certain degree, so if he reads the book at a later time he can discover new things about the plot. This means that it is possible that he has missed parts of the content.
He uses the same method when he is reading notes, where he has learned sight-reading through scanning. He also states that he "cheats" while sight-reading, which leads to roughly correct playing and he hits the notes most of the time. First he concentrates on the important parts. He can see roughly how it is supposed to sound like, so whatever he does not manage to keep up with he adds himself. He might be able to register the correct chord, but might not have time to play the correct arrangement. The next time he plays the passage, however, he knows how it is supposed to be played and can concentrate on other things in the note sheet and can discover more. He describes how you professionally acquire the attitude that you do not let it show if you make a mistake and you do it right the next time. Problems sometimes arise when it is demanded that you play exactly according to the notes, but also outside of the sight-reading moments if you have not rehearsed enough and not gotten the music into your long term memory.

He thinks of the music as a big picture and not so much of the details because he finds them not to be as important. Six months ago he however decided to change this and be very meticulous from the very start. He thinks it is fun and also good for a dyslexic to do this,

especially when playing classical music because recordings are not available. He is somewhat tired of the way he has always done things because of the dyslexia and thinks it is fun to try and submerge himself in, for example, the composer's way of thinking. He wants to be more precise when playing, something the dyslexia does not bring with it. He finds that it has made him sloppy in general because that has been his way of coping with certain passages (read more under question nine).

3. He plays a lot of music with only the melody and chords written down. This way he can make out the arrangement directly through his hands, which is completely different from when he is forced to read notes. He is good at chord analysis (a piece of cake as he describes it) and can immediately connect the notes to the chord they form without the need to look them up. He has learned how chords look visually and has always written down an analysis of the chords of the classical music he has worked with. He does this for two reasons; curiosity (why did it sound like this?) and to help him remember. Skrjabins and Messiaens chords and unconventional chords could demand more, though, because then he does not have a frame of reference. Since he has always thought in a manner of arrangement and composition, he has learned to see the chords vertically. He could analyze score early on and that is a graphic way to "work" with music. Chord analysis is something he has done a lot and he was very interested in this during his teenage years and he read these kinds of analyses and then made his own – without an instrument. He experiences that he has practiced this more than others have. He is interested in the structure, that is what he knows.

4. He is very apt in theory and uses it often. He learned it early on and thinks that structure is enjoyable. He wants to know how things work. He found some kind of investigation from 1960 or 1970 from the music college. It was about the first reporting of jazz theory in music teacher education and contained a lot of theory and history. He liked to figure out a theory graphically so that it all adds up in the end. He has also received many oral advices from teachers and he remembers every single one of them, also those in connection to playing. According to him, that is how you learn since he never seemed to grasp the learning approach used in schools.

5. He uses his aural skills more often than he did previously and can easily copy if he has graphical support from the notes. The notes are for his memory because he does not trust his aural skills completely. He experiences that his aural skills are different from others', more varying, and that he sometimes feels like he has absolute pitch. He therefore feels like he cannot trust it, which is something he would like to do, and that is why he wants to develop his aural skills. He feels like it has to do with some kind of memory and that he has never practiced it for real. The genre also plays a part in this, as well as practice and experience. He is knowledgeable in many genres and styles and thinks that that is fun. He is able to sit down and just play, for example a Mozart pastiche, Chopin, ragtime, '20s or '40s music etcetera, because he knows how to play it and makes up as he goes. His aural skills worsen when he is under just a bit of stress. He regards himself as having a good sense of period, which he means has to do with the holistic thinking.

6. He has good improvisation skills, but does not know if that has anything to do with his dyslexia. He does not feel as locked down as others seem to do when improvising. He thinks these things are hard to determine on your own and that you should ask those who have played with him. The note reading and the coordination between right and left hand is something that he thinks has been affected by the dyslexia.

“Others read the notes better, but I can play around those notes and that is something they cannot.”

If he sat down with the notes to a piano concert by Mozart he would be able to play with the orchestra. Even if what he is playing is made up by him it would sound good and work well, even if it not as technically advanced as what is written in the note sheet. He would not be able to straight up read the notes, but he would be able to play roughly correct and he would also be able to play along even if he did not get any notes at all. Without them, however, it would not sound very good all the time because you have no way of knowing exactly what will come and you have to experiment a little. This is something he finds others are not always as good at.

7. He believes that all dyslexics are generally good at things that have to do with personal interpretation within the music and that they are more creative and have no difficulties with coming up with new notions and ideas. This might be the case because you are not as bound and is able to connect things differently. He also believes music to be an elevated emotional state.

8. –

9. The way he prefers to learn music is dependent on the genre. When it comes to classic, note bound music he finds that the visual does not matter at all, meaning if he sees the notes or not. The best way to learn is then to be able to listen to it. He still prefers notes because that is what counts. If he is to learn a song the notes are what he looks up, but he also finds it enjoyable to listen. Sometimes he will only get sound files, with no attached notes, that people want him to add claviature to. Sometimes he will write down the chords, but when he does not feel like doing that he just listens to it a few times and is then able to play. Doing it this way works fine, but it would probably take a lot less time if he got the chords on paper right away. On the other hand he still has to play through it to know it. He finds it more difficult to play a piece that he has never heard before from a note sheet, than it would be if someone sat down and played it once for him to listen to and him looking at the notes at the same time. That way he has a memory of how it is supposed to sound. He thinks that music is a lot of gesticulation, figuration and movements that you copy from within and he has never only looked at anybody and learned in a visual manner. He has only looked at some soloist who improvised and he wondered what he was really doing in some places. On the question of how he got passed the problems he had with notes he answers that he has learned strategies on how to cope, but also which situations you should back out of. His strategies involve knowing the music well in an intuitive way, improvisation and also keeping your face straight. The way he creates the arrangements while playing, and then remembering them, is called Head-arrangement within Jazz. He still wants the notes in front of him as a backup if he suddenly forgets what to play.

10. The dyslexia also affects how you interpret numbers. When asked if he experiences that he stands out from other musicians he answers that he does not know and that he has always seen himself as different in many ways. (He adds that he is also diagnosed with ADHD). He sees himself as being pedagogical and thinks that that is probably due to the dyslexia. Something he cannot stand is non-pedagogical teachers. His conviction is that even though you are a dyslexic, you should learn notes because it is a universal language and he thinks this is achieved through more repetition etcetera. He believes that dyslexics have to be taught while under stress, so that the learning process ascends the conscious and becomes non-conscious (automated). He compares it to martial arts and means that you should practice

reading notes intensely, but in the right way, with a dyslexic teacher or someone with the adequate education for this. The teacher is also supposed to be more of a coach, cheering on and pep talking. Training could somewhat resemble driving practice: at first it is messy, but after some time it stops being that. He thinks it is important that you get time off to be yourself. Practicing how to handle stress is something he thinks could benefit dyslexics a lot and he also believes that the College of Music should change its pedagogy to suit dyslexics and the admission auditions should have an entirely different format.

Interview subject seven

Gender: Female
Age: 35 years old or more.
Pursuit/Occupation: (Not music related) staff at the Royal College of Music in Stockholm, Amateur musician.
Main instrument(s): Has played the clarinet and the piano a bit.
Dyslexic problems: When it comes to reading she jumbles words and easily jumps to the wrong line when she changes lines. She always ”sounds” when reading and experiences difficulties with new words. She reads quickly but incorrectly and sometimes guesses. Writing also involves problems and she often names mistakes.
Diagnosis: Missing
Interview date: March of 2007

1.-

2. Note reading works pretty well when she cuts up the notes. The larger distances between the lines and the magnified notes simplify reading and makes it easier when she needs to change lines. The pace is important and a slower pace is easier. The clarinet is easier to play than the piano given that it is played one note at a time. She uses the notes as support.

3. -

4. -

5. She has learned the music through notes but feels she has a talent for picking out melodies and learning through aural skills. If she learns through notes she also sees the notes in front of her, even without them. If the way of learning – through aural skills or notes – makes any difference is something she does not know. She explains that they are different genres which in their turn have different levels of difficulty.

6. -

7. Her strongest musical sides are interpretation, expression and feeling.

8. Learning lyrics off by heart is not a problem.

9. She learns the notes first, then the expression.

10. Her weakest musical side is pure technique: technical passages that do not contain very much “music”.

Interview subject eight

Gender: Male
Age: 35 years old or more.
Pursuit/Occupation: Musician and now also craftsman as a piano repair man.
Main instrument(s): Trumpet, as well as some piano. Started playing the trumpet at age twelve. Received education at the Royal College of Music for four years as well as Burkley College in Boston.
Dyslexic problems: Spelling and expressing himself in writing. Difficulties learning certain things and he needs more time. Also diagnosed with dyscalculia (difficulty handling numbers).
Diagnosis: At the age of 40.
Interview date: April 14 2007

1. -

2. He describes that nowadays, he can handle notes just fine, but that it took a long time achieving this. He also describes that he probably is on a level just below normal and that he needs some additional time when sight-reading. He had a very hard time with notes as a child. Transposing causes him some problems. He does not run into notes often and today he mostly plays by ear and improvises a great deal. Playing the piano works out fine but he gets really tired from taking in all that information. He does not see any notes in his mind, but instead hears the melody and the chords within himself constantly. He is also diagnosed with ADHD. Writing notes, getting the music in print and translating it into text, also seem to be a problem for him. It is strenuous work which takes a long time. He does not think this has anything to do with his dyslexia, but rather a lack of routine, because he does not feel confident in what he is doing. He cannot at all grasp how some people can quickly write music with only paper and a pen, without access to an instrument.

3. Playing chords is not a problem anymore, but used to be.

4. When asked if he experiences that theory has a central place in his musical reality he answers: ”Absolutely not”. He does not experience himself being able to think in those terms. He has a hard time remembering a sequence of chords in theoretical terms such as labels and chord names, but can hear it and can play is automatically. He knows theory, but never really uses it. He says that this probably is a sign of laziness. He thinks that he has managed fine with his by ear/non-theoretical way of playing.

5. He describes that he has a kind of absolute pitch when playing the trumpet, with a constant margin of error of exactly one note higher. His aural skills are good, as well as his ability to memorize. Playing by ear is what he usually does nowadays. He experiences himself as even being better than others at the college, if seen from that perspective; he is quicker. The music sticks to his mind better when learning by ear and he remembers it better. He laughs and tells me that there are classical musicians who cannot play at all if they do not have notes in front of them, which is something he cannot understand at all – it is silly.

6. Improvisation is something he does a great deal and this ability he also finds is strong in him.

7. -

8. His ability to memorize when it comes to lyrics is hopeless and he cannot do it at all. He expresses that it is rather a problem of not being dedicated to the lyrics. This ability is nothing he values that much and is comparatively uninteresting in his eyes since he listens to the chords and melody.

9. His preferred way of learning is actually through both learning by ear and by notes. Learning by notes is faster, but you risk getting dependent on them.

10. He has heard that it is usual that artists and musicians are dyslexic. He can also imagine that many athletes are too, that becoming especially good at doing one thing is a dyslexic trait. He sees the music as his salvation. There are no real musical role models in his background and his family was not into music. He discovered it on his own as a young teenager and got properly stuck. Music was his thing, something of his own that he was also good at. This is contrasted by the other subjects in school where he had a hard time keeping up, except in art education and maybe crafts. Pedagogically he thinks that some education could be slowed down and then be more enjoyable to dyslexics. He describes that you, as a dyslexic, can become overly skilled within different areas. You can find many extremely successful dyslexics in our society. He says "…so we are a good lot I think" and laughs.

Interview subject nine

Gender: Female
Age: 20-35 years old.
Pursuit/Occupation: Studies at the Royal College of Music in Stockholm to become a church musician/organ player, year one.
Main instrument(s): Piano, which she started playing at the age of nine. Attended Musikkonservatoriet for one year directly after graduating elementary school. Then she went on to the high school arts program for her second and third year. After that she attended a community college in Härnösand for three years focusing on piano studies. She also attended the conservatory in Trondheim for one semester. Then she took a break from music for two years. Thereafter she started playing the organ and trained to be a cantor in Sköndal for two years.
Dyslexic problems: Could not read after graduating elementary school, but dyslexia was never discussed. She recounts that she managed to graduate thanks to having a "smart" Swedish teacher who recorded all her books on tape. She remembers that the teachers thought a lot about why she could read notes but not text. She can read easier texts now, such as youth literature. This has also contributed to her having next to no knowledge of the English language. She has always been very fascinated by writing and has done a great deal of this. She experiences that formulation can be difficult when writing, but never when speaking. She can also confuse letters.
Diagnosis: -
Interview date: April 24 2007

1.-

2. Reading notes is not a problem and she is able to read several systems unhindered, for example organ notes. She can experience advanced rhythm to be difficult while she is playing, but works well when there is no pitch involved. She describes it as if the pulse core can disappear while she is playing, and that reading the rhythm is not the problem. I ask her if she thinks it would make a difference if the pitch was the same through the whole beat/rhythm, if that would work out better for her. She answered that that is entirely possible. She describes that she has always been very hungry for music. That she only got half a page of piano homework demanded that she continued with the book on her own and played with the help of the notes. She could play the homework the same afternoon she got it and then what was she supposed to do the rest of the week? She wanted more. She thinks this contributed a great deal to her sight-reading.

She can miss written labels in the music by not "seeing" them. This has to do with her ability to read. She cannot see any resemblance between reading text and reading notes, to her they are two entirely separate things.

When I ask if she thinks that she is different from the non-dyslexics in her line of work, she answers that she experiences her sight-reading to be very good. She has almost never met anyone who has a better ability to sight-read. When asked what her weakest side is, she answers that she is so incredibly bound to notes.

3. She can see the chords in a note sheet very quickly. She never consciously thinks their name or label, and plays them instantly – they are in her fingers. It is often so that what she is going to play are harmonious patterns that she has played many times before and the fingers already know where they are supposed to go; that they "sense" what is coming up next. She prefers written down chords over chord analysis. She thinks that chord analysis is more difficult. When analyzing, sevenths and ninths pose no problems, but further chords with added notes could demand more time. She mentions that this could have to do with habit.

4. This is absolutely a central part of her musical reality and she makes use of it a lot. She describes that functionally harmonious thinking is involved in playing the piano, the organ and also when singing in a choir. She says that without it, you have no idea where the music is heading. She can also utilize this when memorizing pieces. She describes herself as having an easy time with theory and harmonics, and has always been very interested in this.

5. "That's the worst!" She thinks that she does not have any aural skills at all and laughs a bit when she says it. She tells me that she has an incredibly difficult time playing by ear and that she has no ability to memorize what-so-ever. She also feels like she is worse off than the others here. She tries not to focus on it being difficult, but only on completing the task and that this might make it easier – but it does not. She has received extra help with her by ear playing and tools to make it easier, for example the triad thinking, sub-categorization, first keeping the basic rhythm without flattening, etcetera. She sees a piano in her mind, but needs a real one in front of her before she can begin searching. Nowadays she will go and look up notes instead of trying to do it by ear because it takes so much energy to do so. She says that she has had such an easy time with notes that she has never been required to use her aural skills in that way. When asked if she experiences any musical difference if she compares herself to other, she answers that they have better aural skills. She says that her aural skills is one of her musical weaknesses alongside her dependency on notes.

6. -

7. She regards her musical expression to be her strongest side. She experiences that she is gifted with having an easy time mediating a musical feeling in a natural way. When she does that she does not analyze or use theory to decide where the phrase is going. She will instead play on feeling alone. Usually she uses feelings as a basis and sometimes she can also see images and courses of events. You are sometimes able to hear more clearly what it is about. The feelings come naturally, but if she does not understand the music she cannot mediate it.

8. She describes that she has a very hard time memorizing lyrics and she will never attempt to unless it is absolutely necessary. The energy it requires to do so overwhelms her. When I ask if she has any way or device to handle that, she says that she has somewhat of an image memory and that she can see the note sheet in front of her. I then ask her if she can see the words in front of her. She first answers yes, but then:

"No, I suppose I don't, when I really think about it", she says and looks surprised. When she thinks about a few songs she only sees the lines of notes. Below, where the lyrics are normally written, she saw nothing.

When I ask if she ever visualize words in her mind she answers that she does not. She adds that that is interesting and something she has not thought about before. Next, when I ask if she has images when it comes to lyrics, images concerning the actual plot, she answers that it is entirely possible.

9. She describes herself as very methodical when she practices and that she is pedagogic with herself in some way. She has to be efficient since the time she has before having to play is often very slim. The way she practices depends on what type of music it is. When playing a piece from the First Viennese School you often see the chords directly, but if the music is something more romantic you might have to take it one hand at a time. She tries to practice from the top as little as possible. It is often the middle part or the ending that you do not really learn. She considers music to often be built rather simplistically and you are able to see the structure quickly. She thinks being able to see the structure is important and that you know the shape. This awareness is also important for the sake of the expression.

10. She thinks that she has the ability to learn new pieces rapidly, something she oftentimes hears from teachers and also from class mates. She believes that it could be rooted in the fact that she is very analytical, an ability she has partly acquired from her time in school. For example, her ability to only read a little but being able to write a lot; what is that about? She has had to process her texts thoroughly.