

The Struggle with Stereopsis

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Abstract

There is a lack of awareness of binocular vision problems. Vision impairment gives serious reading problems for the pupil, can reduce the pupils learning and may damage their self-esteem and socialization. The ability for the eyes to cooperate and create a picture in the brain can often be trained to improve through Vision Therapy and when the program is complete the benefits of the vision training will last for a lifetime. The struggle with Stereopsis is based on a personal story and experience/knowledge but is not a scientific work. The article is about our son with Asperger Syndrome and ADHD who had serious reading problems. The article describes the process that Christian was going through to get to the goal of learning to read.

Keywords: Dyslexia; Stereopsis; Vision Impairment

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Introduction

Reading difficulties are being paid a lot of attention in primary school especially Dyslexia. Dyslexia is a neurological and often genetic condition. It commonly causes difficulties in word recognition, spelling, and decoding. In a person with dyslexia, the brain processes written material differently. Some studies refer to a higher incidence of Dyslexia in children with Autism Spectrum Disorder than in the general population approximately 22%-23% versus 7%-10%. But what many people are not aware of is that reading problems and difficulties in learning can also have root in Binocular Vision Impairment.

Let's have an Overview and an Explanation of the Terms Related to the Condition

Binocular: Of or involving both eyes at once. Binocular Vision refers to a condition where the two eyes view a common portion of visual space as a coordinated team. Stereopsis or Stereoscopic Vision refers to vision wherein two separate images from the two eyes are successfully combined into one image in the brain. Vision Impairment refers to any visual condition wherein binocular visual skills are inadequately developed. Binocular Vision Impairment often results in partial or total loss of stereopsis and binocular depth perception. Autism spectrum disorders (ASDs) are considered as an interesting

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Pupils and students fighting with stereopsis miss the ability of the eyes to coordinate and focus upon the same point. Many teachers, reading aides and ophthalmologist aren't aware of how the vision impairment affects reading, spelling and learning. They are likewise not aware of the associated issues connected with the condition.

How does Difficulties with Stereopsis Manifest?

Difficulty with stereopsis manifests in an inability of the eyes to turn and move fluidly due to muscle rigidity.

To the struggling pupil this is experienced as letters blurring out and lines skipping. Because these letters and words get misunderstood, the pupil in turn misreads them. This makes the text stutter to the reader because the words and sentences don't appear to have any coherence. Besides reading problems, the pupil often suffers from headache, eye pain and fatigue. Sometimes the child also has problems related to physical coordination, with tasks such as climbing stairs or catching balls. Reading is a must today. So the pupil with vision impairment is struggling in all kind of areas such as school education/learning,

doing, homework, chatting, watching TV/movies and reading subtitles. Understanding and relating to other people, and taking part in everyday life can be difficult when having ASD, so the availability to chat is very important for the person. If the child has problems with chatting among friends socialization can become a problem as well.

The condition can lead to problems with learning or in worst case lack of learning if not helped

Even with someone present to correct the pupils reading, the pupil will regardless continue to experience the words differently than they are written. Keeping on this track will only continue the reading problems as well as the difficulty remembering the written material. There can be comorbidity between visual problems, developmental disorders and learning disabilities. So qualified specialist examinations are important. How else do you distinguish which problems are caused by the Autism Spectrum Disorder/ADHD and which are caused by other disorders and condition? If the child's visual condition is severe and it's not helped, it can lead to problems with learning or in worst case the absence of learning.

How many percent of the population has difficulty with Stereopsis?

It is estimated that 15%-20% of the population has some degree of difficulty with stereopsis. The majority will however be able to train their eyes to make up for it through Vision Therapy. When the program is complete the benefits of the vision therapy will last for a lifetime. Vision Therapy is known as vision training, visual training, eyes training, visual therapy and behavioral optometry and can be described as a physical therapy for the visual system which includes the brain and eyes. Vision therapy is offered by Optometrists who make a special and individualized program for the person. The program includes physical exercises and vision training.

Patients of all ages can benefit from the training but the sooner the training gets started the better. A 3 year old child might complete the training in 6 months if training every day. A 9 year-old child may require therapy for more than a year. In Denmark, as well as in other countries, there are clinics that specialize in training stereopsis as well as screening for difficulty with it.

The personal story of an 11 year old boys struggle with Stereopsis: A boy with Asperger Syndrome and ADHD

In the spring of 2009 we reached out to an optometrist who has experience with individualized stereopsis training. Our 11-year old son Christian had for a long time had trouble reading, spelling and decoding. Although we trained reading both at home and at school, who had given him extra reading training for a year and a half, we hadn't made any progress.

Abysmal Motivation

Christian's motivation for reading was abysmal, despite him being aware of the importance of being able to read. I think Christian felt something like this: When you constantly get your reading interrupted, it becomes exhausting and you become annoyed

because you are constantly reminded how bad you are at it even though you try so hard. And when reading practice in school doesn't help, it's hard to see the point of it all. It simply makes no sense.

All kind of tests were made

To find the cause of his reading problems Christian's ears were tested, the school tested him for Dyslexia, short term memory, his ordinary vision and even his IQ. Everything was fine. Therefore the next step was to test his stereopsis, and he did have problems with that. Tests showed that Christian had a hard time focusing. He couldn't turn his eyes inwards very well and often mixed up words like De, Der, Den, Det and Dem who all look quite alike. Christian did also have trouble differentiating between D and O. At home we also experienced that Christian attempted to guess the words in the text when reading, and that he many times had to start over from the very beginning, a beginning he couldn't quite remember anyhow. And correcting him didn't help out.

So we had to try out hands at improving his stereopsis by vision therapy.

Starting vision therapy and how to motivate

In Christians case his vision therapy started with physical exercises not eye training. Christian had a hard time understanding the relevance of the motor training he went through, and complained about it for a long time. How can his vision improve when it's the body he was training? The therapist therefore showed Christian visually how his motor functions and stereopsis are in the same place in the brain, and that training either would improve the other too. Still it was difficult to motivate Christian to spend half an hour everyday training. However my husband and I and his therapist encouraged and sometimes pushed him a bit to stick with it. Christian for example was given small stickers for every exercise, as the number of passed exercises is visible that way. We also gave extra pocket money for saving up for toys he wished for. And we finally made sure that Christian had had break and some rest before starting the training.

Vision therapy is a series of progressive therapeutic procedures for the visual systems which includes the brain and eyes

The contents of Christians training regiments took many forms to match his progress and he has done many activities: Things like skipping on one leg and going across a balance beam, rolling on a chair from one side to another, staring at a moving object, playing the old pc game Pacman and more. For a child and person with Autism Spectrum Disorder and ADHD, the vision training also can help combine the senses as well as developing the senses. We noticed that Christian became more focused. After a year and a half Christian reached our goal. He could now read and follow the subtitles on TV. We had felt the progress earlier though. We experienced that he suddenly started reading signs and advertisements aloud and the school told us about his progress after he had training for a year.

The Benefits from Vision Therapy

Beyond improving his vision significantly, the therapy also did wonders for his self-esteem. He no longer feels stupid. Instead he has become enthusiastic about the educational future and job opportunities. But the feeling of inadequacy is still there somewhere Christian expresses. It could be caused by his Autism Spectrum Disorder and ADHD or by his 5-years long struggle with reading or it could be caused by both.

Start training at an early age and be aware of the use of digital media

Parents and teachers can take action earlier in the child's life through stimuli and training. For the younger kids it is beneficial to support them in crawling and climbing and preferably they should avoid using a baby walker. You should also talk, read, and show pictures to the child regardless of age. Older kids should avoid overreliance on digital media like phones, computers, handheld games and consoles, because these media feed them pre-designed images, instead of letting the child imagine images on their own. And this ability to create your own images in your mind is fundamental to the child's later ability to spell and read. Children have to be able to remember in pictures.

Discussion

If it turns out a child does have poor stereopsis, it is important that everyone recognizes that it takes hard work and time before progress is made. The training can take from 6 months to a year and a half, and the child should be told so up front. Likewise the child should be strongly encouraged to keep up the daily training sessions of around 30 minutes to make this progress possible. As the developing of healthy vision is a long term project, it is important to pay attention to the child's motivation if you want to succeed. For example the parents can motivate the child by making the training positive and make it a shared ritual of the day, as well as of course praising the child for keeping it up. These daily practice sessions can also be turned into a game, like let's try to make the exercises in 28 minutes today, or there can be an associated reward for completing a session, such as star, a piece of fruit, a sweet or a little pocket money. Always listen to the child. If the child is not well, then have fewer exercises that day. But make it clear for the child that the vision training is expected every day and this is an exception. The teachers must also pay positive attention. Ask the child about the therapy and praise the child, both for their perseverance, as well as the progress they are making [1-6].

Conclusion

It is very important that kindergartens and schools try to catch problems with stereopsis early. The pupil won't be able to follow curriculum once reading becomes a mainstay, and this only has a negative effect on their self-esteem and socialization. Worst case scenario the child may simply give up on learning reading, or the teacher may deem them unreachable. Not only will the child miss the opportunity to get an education but will also face bad job opportunities ahead. As an adult the person will even be in risk of not getting a driver license because of being unable to read traffic theory and be unable to drive the car as driving depends on stereo vision and depth perception. So the persons feeling of inadequacy will still exist. P.S. Christian passed his examines in primary school and has later got an education as WEB Integrator. But it was very difficult for Christian and his school to get the time to pass the curriculum as Christian started late reading, 12½-years old. If Christian had not been a pupil in a special school I am not sure that he had managed to pass examines. Not all pupils with ASD will be able to learn to read. But pupils with High Functioning Autism and Asperger Syndrome normally can.

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