



Leo Angart

magic eyes

vision training for children



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8. Eye Movement Skills

Ocular mobility refers to how well you move your eyes. This is the skill that allows you to accurately jump your eyes from one object to another (saccades) and to track moving objects (pursuit) – like following a particular car on a busy street. The ability to fixate on a particular object allows you to keep it in focus briefly, as when you are reading and your eyes jump from one word group to another at the rate at which you integrate the information. Smooth and accurate eye movements are very important when it comes to paying attention, reading properly and doing well in sports.

If there is a difference between the eyes – for example, if one eye is weaker than the other – then you need to balance the vision (see the exercises in Chapter 16). Imbalance (anisometropia) can also make reading more difficult.

Eye movement assessment involves checking fixation maintenance, pursuit and saccadic eye movements. Fixation maintenance represents the ability to maintain a steady image on the retina. We do this when we are reading. Good readers use a stepping movement of the eyes as they fixate on one word or a group of words on the line they are reading. If you have problems with fixation, then you may not be aware that

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you are jumping up a line from the one you want to read, or you may be randomly dropping down a line. You may also drop or lose two- or three-letter words along the way (e.g. and, the, two, me, he, she).

Pursuit eye movements represent the ability to remain fixed on a moving target and ignore the background. This is a vital skill if you want to participate in any team sport, such as football, handball, hockey and so on. To be good at these sports you need to know where your team mates are and to predict where they will be next. If you don't quite know where they are, you are not likely to be on the team for long!

These two eye movement skills are vital when it comes to reading. Research shows that up to 85% of children who have reading difficulties lack efficiency in one or both skills (see Rosner and Gruber, 1985).



The optometrist or eye doctor may test eye movement by doing the “H” ocular movement test: using a pen or some small object and moving it in the shape of a “H” about 30 cm from the child’s eyes. They will look at the child’s eyes and judge if there are any areas where the eyes do not follow easily. You can also do this yourself.

Eye movement skills

Fixation – holding the image of a steady object focused on the retina (e.g. reading a word).

Vestibulo-ocular reflex – holding images of the seen world steady on the retina during brief head movements.

Optokinetic reflex – holding images of the seen world steady during slow head movements (e.g. shifting the gaze from one side to another).

Smooth pursuit – holding the image of a moving object focused on the retina (e.g. when you are following a car on the road and ignoring the background).

Saccades – directing images of eccentrically located objects of interest onto the retina. This occurs when reading because the brain previews the words before they come into clear view.

Vergence – co-ordinating the eyes and moving them in and out, so that the image of a single object is placed simultaneously on the retina of both eyes and fused into one image.

However, the most effective way to test eye movement skills is with a Visagraph mask. This is an ingenious device which uses infrared sensors to accurately trace the movements of the eyes while reading. The equipment is connected to a computer

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software package which analyzes and displays a graph of how the eyes move while the child is reading. This is by far the most accurate way of measuring what the eyes do while reading. For instance, the graphs reveal the number of fixations per 100 words and the time of fixation connected with the length of the word.

The speed of reading is measured by words per minute and you can see at once which age level this corresponds to. You can also compare the movements of the left and right eye. In combination with Vision Training and a reading skill program, the Visagraph can also display any progress the child makes.

What is a Visagraph test?

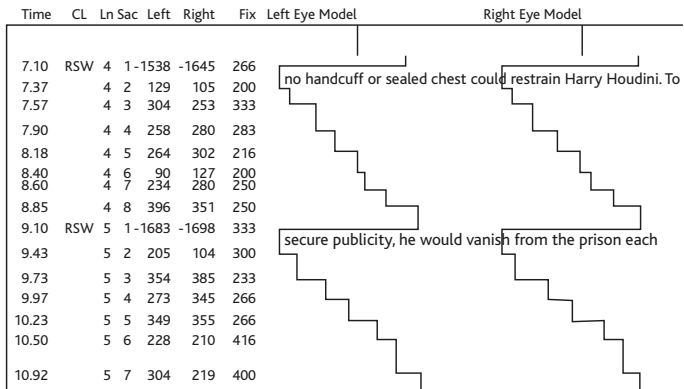
The Visagraph was developed by Stanford E. Taylor. It is an ingenious eye movement recording device, incorporated into a pair of goggles, which is used to accurately capture what happens when a child is reading. This test is the gold standard when it comes to testing eye movement when reading.

The device records eye movements while the child reads ten lines of easy-to-read text. This data is then saved to software on an ordinary personal computer for analysis. A graph can be printed out that accurately shows how the eyes move. In addition, an animation is available that

Eye Movement Skills

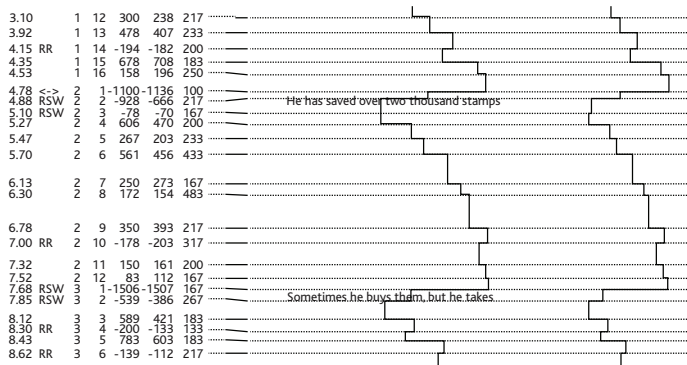
shows how the eyes move over the text. This is extremely useful since it shows the child what his or her eyes are doing. It can also be used to show progress if repeated after training.

The graph below is from a good reader. You can see the staircase pattern as the eye fixates on words along the line.



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This graph shows a child with poor eye movement skills. It is clear that the two eyes are not working together and there are frequent regressions.



Taylor recommended that all children are tested with the Visagraph at 9 years, 12 years and 14 years to make sure that eye movements are well established and have become automatic. The test doesn't take long, so if your child has difficulty reading, look for an optometrist who uses the Visagraph. If your child's eyes are not working together properly, just looking from word to word will require a lot of effort.

A simpler way to approximate the Visagraph is to use a piece of string to check whether the eyes maintain their convergence point while reading.

Testing convergence

This test provides accurate feedback on whether the two eyes converge. When you view a string held on your nose and pulled out directly in front of you, you will see two strings forming an “X,” “V” or “Y.” The crossing point should be exactly where you place your finger or tie a knot. The convergence point should be exactly through the center of the knot, and it should remain steady when you move the string from side to side horizontally. If not, there is a convergence issue which may result in reading difficulties.



Here's how to do the test:

1. Tie a knot in a piece of string at the normal reading distance of about 30 cm (approximately the length from hand to hand stretched across your chest).

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2. Ask the child to place one end of the string on their nose.
3. Position the knot roughly where the top of a page would be and slowly move it from left to right, as when reading. Move the knot down the imaginary page with a zig-zag movement.
4. Ask the child to tell you if the crossing point moves in or out as the knot travels the imaginary page.
5. If the crossing point moves in or out at any point, then there is a potential problem with pursuit skills.

Sometimes, as you move the string all the way to one side, you will notice the child's co-ordination gets lost. If your child is showing signs of pursuit problems, then encourage them to mentally control the position of the crossing point so it is always exactly on the knot.



Eye Movement Skills

Testing for these skills is unfortunately something optometrists and eye doctors often omit in their standard testing procedures. However, if your child has problems in this area, it is a major issue because it gets worse as they get tired.

One gentleman in his sixties told me that since childhood he had only ever been able to read one word at a time. Imagine going through school like that! When we did the convergence test, we discovered that his crossing point moved in and out as his eyes traveled horizontally across the imaginary page. This meant that his eyes would lose focus as he moved from word to word; focusing either behind or above the page can cause the words to appear double or invisible. He was thrilled when he discovered that he could actually keep the crossing point on the knot all the way across and up and down the imaginary page.

Another example was a boy in Sydney, Australia. During lunch, he told me that he could not see what he was writing, he felt it. I watched him while he wrote, "The fox jumps over the fence." I noticed that his crossing point was actually about 8 cm above the paper on which he was writing. This is called convergence insufficiency and is present in many children diagnosed with attention-deficit hyperactivity disorder (ADHD) and dyslexia. (Try holding one of your fingers about 5 cm above the page as you read this. Look at your finger and continue reading. You will have experienced the convergence insufficiency this boy suffered when reading or writing. It is possible to read like this, but it is very strenuous and you become tired extremely quickly.) By the way, after lunch the boy's father was amazed

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that he was happily reading the Sunday newspaper magazine without his glasses!

Eye movement exercise



Here is a simple exercise that will help children to learn to move their eyes smoothly in all directions. You will need a brightly colored tennis ball, or similar, and some string.

1. Attach the string to the ball so you can move it around like a pendulum.
2. Ask the child to lie down on their back. Make sure that there is no light shining down directly into their eyes.

“Leo Angart is a vision artisan who has been immensely helpful to both my children (and me). *Magic Eyes* is a treasure trove of knowledge that Leo has accumulated over years of study and hands-on experience. He has developed techniques that rapidly correct visual afflictions from which children (and adults) suffer; thus restoring normal vision naturally.”

Russell Park-Miller, parent

Children are sometimes prescribed glasses at a very young age but there are natural methods that can make your child’s eyes healthy and strong and eliminate the need for glasses.

Leo Angart runs workshops all over the world, helping people to regain their natural vision and throw away their glasses for good. He has encountered an increasing number of children whose eyesight has been adversely affected by their glasses or who don’t really need glasses at all.

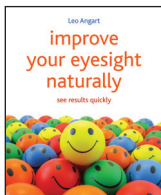
In **Magic Eyes** Leo shares his experience and explains what you can do to help transform your child’s eyesight. He demystifies common eye conditions, explains their causes and suggests simple solutions you can try at home. Case studies, diagrams and step-by-step exercises will show you how your child can perfect their vision.

“I very much like this book; it is the best of its kind, written by an author who combines scientific knowledge with lifelong experience and common sense. It is very important to let people know that there is a way besides evidence based medicine, which could support classic intervention given that so many people suffer from unsuccessful treatment.”

Alexander Raditschnig , MSc Optometry

“Our son has gone from having +6 glasses to not needing glasses at all today. It’s amazing! I’m starting to really understand that this is for real – that it really works.”

Erika Finnström, parent



Leo Angart is a business consultant, author and trainer. Having worn glasses for more than 25 years he writes from personal experience. It has now been more than 20 years since he threw away his glasses.

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