



[Understanding Vision](#) Oct 16, 2017

Better vision with a new pair of glasses.

What's important for tailor-made glasses? Knowing how a patient's eyes interact.

Dirk Siemsen is a qualified optician and owner of

[mahrt und hoerning in Göttingen \(Germany\)](#). His new patient had been wearing glasses for more than 30 years. She had problems with her night and 3D vision, complained of light sensitivity during the day and was nearsighted. Unfortunately, none of her glasses had thus far provided her with the optimum vision she needed over the long term. **BETTER VISION** wanted to know how she finally found the optimum pair of glasses and why examining her binocular vision was so important to finding a solution.



Dirk Siemsen - mahrt und hoerning

BETTER VISION: What did you do differently for this particular patient?

Dirk Siemsen: Truth be told, this patient was not a special case for us at mahrt und hoerning. The crucial question with every one of our patients is: what makes their vision needs unique? As much as possible we want to optimize each patient's vision using every optical tool at our disposal to obtain maximum acuity. We invest a lot of time in this process.

We begin by taking a very thorough medical history. We ask patients about their visual habits, both at work and in their free time. We find out what vision problems they have. We also ask if they suffer from certain illnesses which can affect vision, if they've been under a lot of stress or if they've noticed headaches or muscle tension. And, if so, how something like a headache manifests itself. We then analyze the patient's visual performance using the [i.Profiler](#), examine the back of the eye with the fundus camera – especially the optic nerve head – and check if the patient has cataracts... Of course the ophthalmologist is responsible for treating eye illnesses. For us, getting an impression of the transparency and performance of the eyes is the preparatory stage for the refraction procedure. Working closely with ophthalmologists is really important to us.

It's also crucial that we observe the patient's posture. This is easy to do in the refraction room during an eye examination. Could certain head and body movements be influencing the patient's vision? This allows us to draw our first conclusions. And this is exactly how it was with the patient we were just talking about.



When discussing her medical history, she talked about having frequent headaches.

BETTER VISION: What did you notice about the patient specifically?

Dirk Siemsen: When discussing her medical history, she talked about having frequent headaches. I also noticed that she tilted her head a certain way when focusing on the eye charts in the refraction room. She often felt that she suffered from glare and was very sensitive to light during the day.

As with all of our patients, I checked her binocular vision, i.e., how her two eyes worked together. We used the i.Polatest and the different tests that come with it. At first the patient saw our 3D tests in one dimension only. The leading eye took over. The image was just not being properly projected by the two eyes onto the same position on the retina. When they overlapped, the two images on the retina seemed to have different heights. The patient's brain could not interpret this image in 3D. It was flattened and one dimensional.

BETTER VISION: Don't we all look straight ahead?

Dirk Siemsen: We're all different and that means our eyes don't always look straight ahead like they should. Here's an example: for a person who wears glasses, both eyes easily look slightly outwards when not moving. This means that the person's leading eye, which everyone has, uses the muscles to position itself so that it's looking straight ahead. The non-leading eye adjusts to this situation. The image generated by the two eyes is not optimum, but our brain converts it so that it looks right. This isn't a problem for everyone, but for many people this causes strain over the long term. By optimizing the eyeglass lenses for the interaction of the two eyes, we're able to keep the patient's visual performance high and reduce strain. Think about it: if a lens for binocular vision is

improperly corrected by just 0.25 diopters, this can mean a loss in vision performance of up to 30%. This is why we have to work accurately and check the interaction of the two corrected eyes for every dioptre adjustment during refraction. If I change something in the left eye, that also affects the right eye...

BETTER VISION: What exactly was wrong with your patient?

Dirk Siemsen: With her there was what we call a vertical offset. Her eyes did not enjoy optimum straightforward vision, not only when viewing from an angle but also from above. This caused problems for the patient over the long run. And she didn't have the right lenses to compensate for this defect. We relieved her visual strain by incorporating prisms in the lens to correct her condition, known as associated heterophoria.

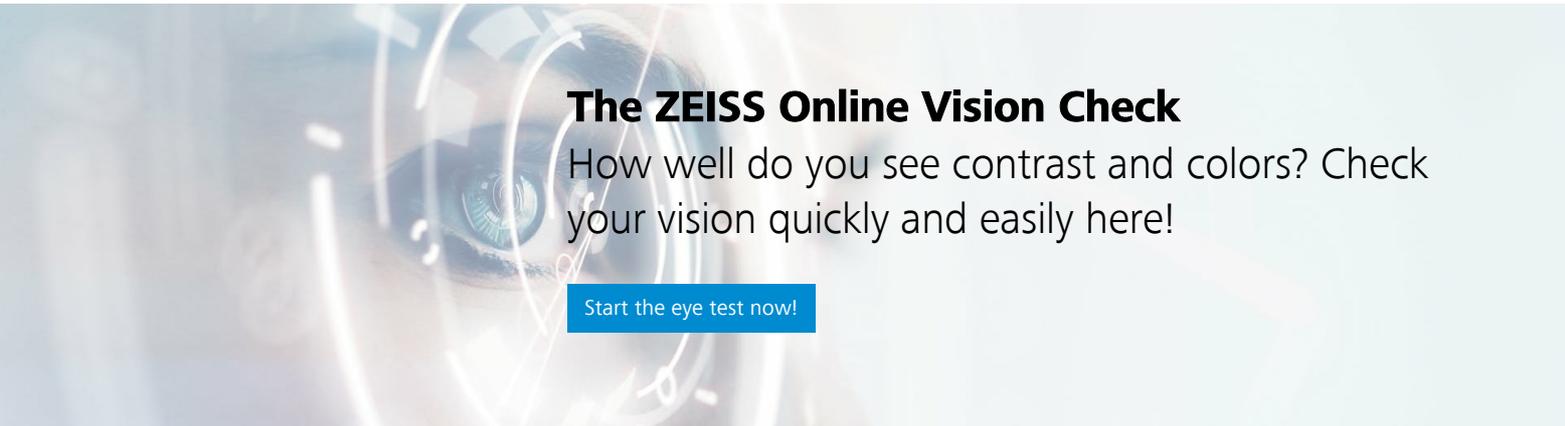
BETTER VISION: Could associated heterophoria really have been a problem for 30 years?

Dirk Siemsen: How the eyes are designed and the length of the muscles in the eye, all that is genetically pre-programmed – and is hereditary. When you're a kid or a young adult, you can still offset certain deficiencies. But this ability diminishes as you get older as well as during stressful periods of your life. Sometimes you might notice this strain – such as in the form of headaches or muscle tension – but these symptoms go away and do not become perceptible again until old age.

BETTER VISION: Experts disagree about how to correct associated heterophoria. Why is this the case? A few even warn that you can become "addicted" to wearing glasses with prism lenses.

Dirk Siemsen: That's true. For me what matters most is if we've helped the patient. We were not only able to help this particular woman. In this case, her recurrent headaches were gone after a break-in period of two weeks, as was the uneasy feeling that her glasses were not optimum in every situation. Her sensitivity to light during the day was greatly reduced. She even asked me if she would now become addicted to her glasses. The answer was simple. I told her that if she chooses not to wear these new glasses, her vision would be just like it was before. What else could I say?

Dirk Siemsen: First and foremost we're interested in each of our patient's individual vision needs. We do everything possible to keep their visual performance high and, if needed, to reduce strain. Thus we take plenty of time to discuss the patient's medical history, to perform the refraction and to advise our patients after they've made their purchase.



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What is associated heterophoria?

If binocular vision is normal, both eyes see the object in question identically. With associated heterophoria, there is an imbalance of the eye movement muscles, which requires a great deal of energy from a person with this condition to make vision possible. If the eyes were to take up the most strain-free position, the result would be double vision. People who suffer from associated heterophoria are subject to the (involuntary) compulsion to compensate for this vision problem, which results in a wide range of complaints. The closest comparison is a deviation from the normal bodily structure, e.g., one leg is slightly shorter than the other. This often results in back pain and tension, which are easy to compensate for with an appropriate insole in the shoe. Prism eyeglass lenses can compensate for associated heterophoria.

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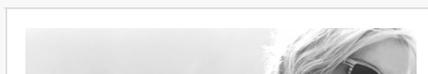


No face is perfectly symmetrical, and no two people's eyes are the same distance apart

Only after the glasses frames have been precisely adjusted to the individual wearer can the lenses perform to their full potential.

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