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The phenomenon of treatment with coloured filter glasses

1 The discovery of coloured filter glasses as a remedy for reading difficulties

Casual observations can lead to some great discoveries, assuming that the observer is vigilant and is interested in the 'how' and 'why' of his observation.

A fundamentally simple observation led to the simultaneous discovery and treatment of a hitherto unknown condition (see below).
In 1981, the school psychologist Helen Irlen (1) was leading an American state-financed research project into adult learning disabilities. She was specifically researching the causes of learning disorders in adults who were unable to read, despite them having undergone every possible treatment and remedial measures at school. She was searching for a new and more effective method of treatment. A casual observation in the process became both a turning point and origin of a new treatment technique and science:
A student had placed a red plastic film over the text that she was reading, when she let out a cry of surprise. Suddenly she was able to read, as the words no longer wavered on the page. Helen Irlen then found that a large number of people with these learning and reading disabilities could be helped by using the colour filters. At the same time, she made the even more spectacular discovery that the reading disorder is just one symptom of a complex of medical conditions existing from earliest childhood, which can bear on one's everyday life. Various other skills can be affected by the symptoms.

Interestingly, some of the symptoms were already written about in 1980 in a study by Olive Meares (2).

2 The Irlen syndrome

The main symptoms of the Irlen syndrome are over-sensitivity to parts of the light spectrum, illusory movements from regular repetitive patterns found in certain ground surfaces, learning and reading difficulties. We addressed the problem of Irlen syndrome, asthenopia and reading impairment in an article from 2005. Parents may have noticed certain behavioural patterns early on in childhood; for example the child turning its head away from light even as a baby, being afraid to climb the stairs, uncoordinated when playing or unable to catch a ball. Yet not until the reading difficulties emerged was their attention aroused. The sufferers themselves do not even know as adults what is wrong. They first notice it when they see and compare the world through appropriate colour filters.
The lights in the supermarket do not dazzle so unbearably; the stairs are no longer a steep wall without steps; the elements of the patterned ground surfaces no longer move around; reading, writing and performance at school improve.

3 Treatment of the Irlen syndrome

It is not possible to predict or calculate whether or even which filters work. Only the patient can sense and determine this. A filter can only be deemed effective by experimenting. An improvement in reading aloud and observing steadier movements are objective criteria in ascertaining whether the filter is helpful.
Helen Irlen worked out an examination and treatment table for the Irlen syndrome. It is currently adopted worldwide by so-called Irlen 'screeners' and diagnosticians.

Two steps can be defined:

1. Irlen screening:

In a structured and extensive screening the patient is provided with films which differ in colour, saturation and translucency. The colour films chosen by the patient are laid over the text. If no difference in reading is noticed with or without the films, then an Irlen syndrome is probably not the cause here. However, a second examination is sometimes necessary in order to totally exclude this. If a definite improvement is noticed, then the second step is necessary.

2. Irlen diagnosis:

An advanced, structured process (Irlen diagnosis) clarifies whether the Irlen syndrome can be more extensively treated with special filter glasses. Middle and long-range visual tests are also carried out, with and without coloured glasses, thus testing the effectiveness of the agreed colour combination.

Finally the untreated plastic lenses (CR39 quality), with possible adjustments, are sent to the Irlen institute in the USA. The lenses are then dyed to the individually determined colour in the Institute's laboratory. The lenses are then fitted into the glasses by one's own optician.

4 Case studies

The Irlen examination and treatment methods are offered by many therapists today, until a few years ago though mainly in English speaking countries.
I know of two therapists here, Fritz Steiner[1] in Switzerland and Shulamit Elad[2] in Israel. The cases that they report are very similar to an extent.
Schulamith Eldan works as a dyslexia therapist and an Irlen diagnostician. The cases referred to her deal with learning and reading impairment. In many cases, learning and reading with colour filters improved almost instantly.

Here are some of her cases:

Miriam, 8 years old, in the 3rd class, knows all the letters and punctuation marks. However she can not read a word with more than 3 letters, and mixes up the letters in the middle. With a colour film over the text (she needs three yellow films on top of each other) she no longer confuses any letters. She is so happy that, after the treatment, she goes straight to a bookshop with her mother and starts to read her new book straightaway. Before this she could only decipher titles. After one month she receives her glasses with the dyed lenses. In her following school report she receives a commendation for improvement in reading.

Sheery, 21 years old, Biology student. When she was reading, the text would frequently move around, became blurred or three-dimensional, i.e. stand right out. She needed a lot of time to grasp what she was reading at all. She used to drink up to 10 cups of coffee a day in order to stay awake. She was unable to go shopping in a supermarket because the bright light and the noise bothered her so much. During exams she couldn't write properly, as the light in the university rooms was too strong for her. Immediately after starting to wear the dyed lenses,

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she had no more trouble whatsoever with her studies and all the other everyday hindrances disappeared. Two cups of coffee a day sufficed.

Dani, 7 years old, was in a special remedial class in normal school, as he was still unable to read in the second class. Using coloured films he began to read and practised this every evening at home. After one month he received his glasses with the coloured lenses and went into the 2nd regular class. The following school year he was placed in the 3rd regular class.

Naomi, 9 years old, in the 4th class, had to ask her school friends for their books to find out what the homework was. She was incapable of copying down from the blackboard. Her writing was illegible. She got headaches when she began to read. She was taken to the optician many times, who claimed the girl was 'making a fuss'. He could see no reason for the disorders, as her vision seemed impeccable. The Irlen examination showed that Naomi's perception range (extent of perception looking straight ahead without moving one's eyes) was concentrically severely restricted. Even with medium-sized print, she could only read one short word at a time. The text moved around as soon as she started to read. With a coloured film she began to read freely, both at school and at home, and completed her homework without her friends' help, but still complained of head and stomach aches.
The filter glasses brought about a dramatic improvement in the girl's disorders, wrote her mother. The examination showed that her perception range had become significantly larger. She was able to concentrate and socially integrate herself better. In a composition entitled "blue glasses", the girl wrote neatly and legibly: "Since I've had my blue glasses, I feel like the queen of the school. The children think that I'm wearing sunglasses."

Rachel, 39 years old, mother of Naomi. After the dramatic improvements in her daughter, her mother was also examined. Her ailments were: extreme fatigue during the whole day, constant suffering of headaches, only able to read what she had to, incapable of driving at night and unable to assess distances. Her movements were unsteady, tentatively putting one foot in front of the other. With the colour filter glasses her whole quality of life has increased. She is significantly less tired and her headaches are less frequent. She now reads books for pleasure and driving is much easier now. Everyday work is much less trouble, her movement is free and steady. Before, it was as if she "was walking on a tightrope."

Fritz Steiner is a teacher, expert in learning support, Low-Vision trainer and Irlen diagnostician.

Some examples from his practice:

Hans, 12 years old, complained of headaches and eyestrain when reading, letters and lines moved around. His extreme efforts to read were clearly observed. He constantly changed his reading distance, pulled his eyes right up and gazed at the text.
With the Irlen filters: "My eyes no longer hurt when I read, nor do the letters jump around, I no longer see just single letters, but I identify whole words." When reading aloud, one notices his fluent reading and correct word stress, i.e. his attention is no longer focused on recognising the letters, but is diverted to the actual content of the text.

Bettina, 16 years old, complained of illusory movements of regular patterns, which impaired her movement. "The square sways back and forth." Window frames also moved. The effort to read, visible in her vertical frown and tense face, was "written all over her face". With the Irlen filters there are no more illusory movements and reading is effortless.

Romi, 12 years old, complained of great strain and fatigue when reading, and difficulty in reading musical notes. When reading her tense posture, tense facial expression and muscular tension around the eyes and on the forehead was striking. She constantly changed her reading distance, moved her head as she read, and liked to use her finger to help read. Her perception range was greatly restricted. She could only recognise one musical note at a time. With the Irlen filters, her reading is fluent, the stress is correct, and there is no more tiredness when reading. Instead of just a single note, she can make out a whole bar at a time with all the notes and signs. Her school performance has greatly improved, and her reduced stress level has made her much more self-confident in the company of other students.

5 Secondary Irlen syndrome

Apart from children who have reading difficulties due to an innate Irlen syndrome, more and more sufferers with the usual symptoms approach us – over sensitivity to light, illusory movements from regular patterns, reading difficulties – having head injuries resulting from an accident – and whiplash. As a result of the latter, the interdisciplinary reference book "Whiplash – the latest perspective" (4) discusses, among other things, distinct over sensitivity to light, greater strain and blind spots when reading. According to Fritz Steiner, colour filters also lead to improvements here not just in reading and movement but also in other everyday activities. Unlike an innate primary Irlen syndrome, the sufferers are aware of their symptoms, as they can remember their normal condition.

6 Etiology of the Irlen syndrome

The acquired, i.e. secondary Irlen syndrome makes the question of the causes of the disorder even more complicated. The symptoms and the remedy with colour filters are the same for both primary and secondary Irlen syndrome. If a primary syndrome is assumed, it is primarily a matter of an innate peripheral dysfunction of the visual system, for instance an anomaly in the colour receptors of the retina. This can not therefore apply to the secondary syndrome. In this case, a central dysfunction resulting from the trauma has to be the cause, thus in the centre of the brain, which processes incoming visual information from outside. This could explain the healing of the primary and secondary Irlen syndrome and the improvements with the colour filters. Yet what has still not been explained is the connection of the typical symptoms. What has an excessive over sensitivity to light to do with illusory movements and reading disorders? On the basis of a case of secondary Irlen syndrome from optic retrobulbar neuritis, we established the following theory:
An Irlen syndrome is concerned with a coordination dysfunction of the parvo and magno-cellular system. The parvo system steadily and continuously transmits information concerning the colour and shape of an object from the retina to the cortex of the temporal lobe, and it is 'oblivious to movement'. The magno system swiftly carries information mainly about the location and movement of an object to the cortex of the rear parietal lobe for processing, and it is colour blind. They are coordinated in such a way that when one of them is active, the other 'remains still'. It is assumed here that there is a mutual constraint between both systems. The main area of the parvo system is the central retina, with its many cones and few rods. The main area of the magno system is the peripheral retina, with many rods and few cones. The first is sensitive to contrasts in small contours and colour, the latter sensitive to light, dark and light contrasts and movements. Symptoms of an Irlen syndrome are already explained by an excessive irritation of the magno system when reading: over sensitivity to light with glare from the contrast between the black characters and the white background; illusory movements of characters and words, brought about by regular black and white patterns, which black lines

together with white spaces create. Regular black and white patterns which encourage illusory movements have also been proved in experiments with normal individuals. The excessive irritation of the magno system must be attributed to a peripherally or centrally located, innate or acquired weakness in the parvo system, which exerts a deficient constraint on the magno system. The role of the colour filter is thus: a strengthening of the parvo system or a slowing down of the magno system by the removal or addition of various individually pre-determined colours. Our theory is speculative, though we have yet to find a better explanation.

7 Problems at school and Irlen syndrome

Learning and reading difficulties have various causes and require specific treatment relating to the cause, as is described at length in the inter-disciplinary textbook of the treatment of learning and reading difficulties (7). The Irlen syndrome is one such cause. It is also relatively easy to diagnose. The Irlen screening examination using colour films should therefore be used as a routine examination in schools for children with reading difficulties, in order to single out those with an Irlen syndrome and to administer treatment. In this way difficult school years and associated social marginalisation as well as hardship in adult life will be spared.

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