

Irlen Syndrome: Why the cool coloured shades?

Melissa Heine

Undergraduate student, Bachelor of Science/Bachelor of Teaching, Discipline of Education, Avondale College of Higher Education, Cooranbong, NSW

Bradley Martin

Postgraduate student, Master of Teaching, Discipline of Education, Avondale College of Higher Education, Cooranbong, NSW

Marion Shields

Senior Lecturer, Discipline of Education, Avondale College of Higher Education, Cooranbong, NSW

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Abstract

In a world of inclusive education and assistive technologies, it is more important than ever to ensure every member of the class is given the opportunity of a sound education. This may present a challenge when almost every classroom includes students with additional and specific needs. MISViS (Meares-Irlen Syndrome Visual Stress) is one example of a learning disability that will require additional accommodations, but can be readily managed once a teacher is familiar with the individual's needs.

Introduction

MISViS is a relatively common neurological dysfunction that causes visual perceptual distortions for some individuals. These distortions cause the text to appear to move, distort and/or change colour or shape (Millodot, 2009). It is important to recognise that MISViS is not an optical condition; it is a neural disorder that affects perceptual processing (Chouinard, Zhou, Hrybouski, Kim & Cummine, 2012). This condition was independently discovered by New Zealand teacher Olive Meares in 1980 and American psychologist Helen Irlen in 1983. Both identified individuals with perceptual dysfunction in the way the brain attempts to decode visual information, and both sought to treat the disorder through a method known as colour therapy (Crabtree, 2011). MISViS is also known as Irlen syndrome, Meares-Irlen syndrome, Scotopic Sensitivity and/or Visual Stress.

Irlen Syndrome symptoms

Studies have indicated that MISViS affects between 5-20% of the general population (Kriss & Evans, 2005) and occurs in 30-45% of individuals with other conditions that also affect learning such as ADHD, dyslexia, ASD, photosensitive epilepsy, binocular instability and chronic fatigue syndrome (Chouinard, Zhou, Hrybouski, Kim & Cummine, 2012). Common external symptoms of MISViS include light sensitivity resulting in headaches, dizziness, anxiety and fatigue (Randall, 2013); reading problems including poor comprehension, skipping words or lines, reading in dim light, constantly losing place; writing problems such as unequal letter size or spacing, writing up/downhill; poor depth perception including difficulty judging distances or catching objects and general clumsiness (Crabtree, 2011).

MISViS is commonly confused with dyslexia and is often misdiagnosed as dyslexia. Statistics suggest that 46% of people with dyslexia also have MISViS, however, there are distinct differences (Chang, Kim, Kim & Cho, 2014). Dyslexia is a miscomprehension of reading associated with difficulties in sequencing letters and phonics, and to an extent a child can be trained in phonics and adjust to their disability. MISViS cannot be addressed through training as the difficulty is in perceiving the words. Tinted glasses/coloured filters will need to be a lifelong intervention (Chang et al., 2014).

Many individuals with MISViS do not know that they have a learning disability. It is hard to know that words are supposed to stay still on a page when that has never been their experience of 'normal' print (AAIC, 2014).

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Causes and Treatment

In some cases MISViS is a genetic condition that can be inherited from a parent (Taub, Shallo-Hoffmann, Steinman & Steinman, 2009) or even from significant head trauma (Australasian Association of Irlen Consultants Incorporated, 2013).

Two interdependent dysfunctions within the brain define this condition.

Deficiencies in the magnocellular pathways

The magnocellular pathways originate at the retina of the eye and transmit visual information directly to the primary visual cortex of the brain. These pathways convey information about motion and depth, meaning that a dysfunction could destabilise visual fixation (focus) and cause the visual perceptual distortions commonly experienced by individuals with MISViS (Stein, 2003).

Hyper-excitability of the visual cortex:

There are certain groups of cells within the visual cortex (the area of the brain that processes visual information) referred to as orientation columns. These cell groups react simultaneously to stimuli with particular orientations (or in the case of MISViS, hues and frequencies of light), causing over-excitation throughout the visual cortex (Wilkins, Huang & Cao, 2007).

In combination these two dysfunctions result in disrupted synchronisation of visual signals and messages to the cerebral cortex, resulting in the visual distortions symptomatic of MISViS. The visual representation of MISViS in the form of neural imaging confirmed the existence of MISViS and extended its neurological understanding.

Diagnosis

Before MISViS is specifically diagnosed, individuals should be tested by an optician for optical vision impairments. First, to ensure that the symptoms are not being caused by an optical visual impairment (in which the individual may now have MISViS), and secondly to ensure that if an individual does require coloured eyeglasses that these glasses are created with a proper prescription to also correct any optical impairments that may limit the effectiveness of colour therapy (Crabtree, 2011).

If problems persist following an optical test, individuals should undergo a screening process using colour overlays to determine if MISViS is present, and if so, identify the particular colour that mitigates their specific colour sensitivity. There are no especially common colours that benefit individuals with MISViS: colour preferences tend to be idiosyncratic and consistent (Wilkins, Sihara, & Myers, 2005). Generally tinted lenses are more

effective than colour overlays or paper, given their broader applications including the use of technology and reading from a whiteboard. Tinted lenses may also be a specific hue rather than a generic colour as with overlays (Chouinard et al., 2012).

Despite scepticism from some professionals (Melbourne Psychology Services, 2016), increasing numbers of studies are validating the benefits of specifically designed coloured lenses in reducing visual distortions and improving various aspects of reading for those with MISViS (Hall, Ray, Harries & Stein, 2013). It has been noted that some previously critical studies of MISViS did not use the personally prescribed tinted lenses for the child being tested (Harries et al., 2014). The British Institute of Optometry also advocates the use of coloured lenses to ameliorate the symptoms of visual stress (Allen, Evans & Wilkins, 2012).

Classroom Strategies

Creating an *individualised education program* (IEP) is important when dealing with any special education needs. Creating an IEP for a child with MISViS is important to ascertain the specific needs of the individual as each child is unique and has his or her own requirements. Include relevant medical professionals either through a phone call, face to face contact or a letter outlining recommendations and the extent of the child's condition. Ensure that the parents are also involved; this may be difficult for them to grasp or it may be a relief to have the school support; in either situation, show compassion and listen with interest.

In class, assistive measures should include printing all *class materials on coloured paper or having coloured overlays* (Uccula, Enna & Mulatti, 2014) as this has been shown to reduce the wavelengths of light that may cause irritation. When writing on the board, use different coloured pens to find a contrast that suits the student. Trial different colours each day until a colour of best fit is found.

Seat students in a position that reduces glare from windows or overhead fluorescent lighting or allow them to wear a cap or visor in class (Loew, Jones & Watson, 2014).

Depth perception is also an issue for students with MISViS of which teachers, especially Physical Education teachers, need to be aware. Activities involving judging heights, distances, speeds, movement, catching and throwing balls, stepping on and off escalators, needing *additional care and management* (Kruk, Sumblar & Willows, 2008).

Social/emotional implications are some of the most serious issues for children with MISViS. Not only do they frequently feel stupid because of their reading difficulties, this is further compounded when

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other children appear to have no problems. They do not realise that for other children the words do not move. Teachers need to be aware of this by *not having the child read aloud in class* (Irlen, Alberta, 2013); by *task analysing, structuring and reducing the work to increase the potential for success*, and affirming the child for this (Harries et al., 2014); by carefully choosing *supportive group members, closely supervising and having a zero tolerance policy to prevent bullying*, the child's anxiety and stress will reduce. Following testing, *encourage the child to wear his/her glasses*. All of the students in class can try out different coloured worksheets and/or overlays as part of developing their understanding of MISViS. Harries et al. (2014) also described the emotional strain on the parents in their study who reported trying to have their child's condition diagnosed and being passed from teachers to doctors to opticians without success.

Many assistive technologies exist that can be used for students with MISViS. For direct computer/device work *adjust screen brightness, contrast and all application background colour settings*. Applications such as *display tuner* and *ER-browser* can assist with creating coloured backgrounds in various computer applications e.g. internet browsers and word documents (Harpold, 2013). Also *adjust fonts*; fonts with serifs are difficult to read as the

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Recently a pre-service teacher shared information in the special education class about her own child. Her child's teacher had phoned her with the following story: We were reading together and I was listening to your little girl. Suddenly she said to me: "Oh Mrs X, the words are all running off the page! But don't worry, they'll be back again in a minute or two....here they come now!" Subsequently the little girl was assessed for MISViS, and once fitted with her personalised, tinted spectacles, her reading improved greatly.

letters tend to merge together and can become indistinguishable from one another. Choose sans-serif fonts such as Tahoma, Calibri and Arial that are well-spaced, with clear and distinct letters.

For senior students sitting exams, in NSW the Board of Studies Teaching and Educational Standards has permitted certain assistive measures. These include the use of coloured overlays, visual aids and special lighting. To be granted these measures requires written evidence from the teacher and a medical diagnosis of MISViS (BOSTES, 2013).

Conclusion

Despite its high prevalence within the general population and relatively simple mitigation of symptoms, MISViS is not a commonly known or understood condition. The earlier MISViS is detected and treated the greater the potential for increased efficiency and quality of life for the individual. **TEACH**

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