

# Visual-perceptual difficulties and the impact on children's learning: are teachers missing the page?

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This article attempts to bring to the fore of educational practice the importance of considering the visual-perceptual condition of Meares-Irlen syndrome (MIS) when identifying students who have prolonged reading difficulties. Dyslexia is a frequently used term which can be used to label children who have specific difficulties with reading and/or spelling but this article discusses the problems that this may cause students who have a reading difficulty caused by a visual processing difficulty, as the working definitions of dyslexia do not, generally, consider this aspect as a factor, especially when remediation interventions are put forward. This article discusses the possibility that teachers and school psychologists may not be fully aware of MIS and therefore not able to recognise it. Moreover, if this condition is not adequately picked up at the important transition times in school then this could harm the student's self-esteem and affect his or her motivation to succeed in school. The authors argue that the irony of MIS being potentially undetected by teachers and other school professionals is that it is relatively straightforward to identify, and in many cases, to correct.

**Key words:** Meares-Irlen syndrome, visual perception, identification and assessment, school psychologist.

## Introduction

Students having difficulties with reading is hardly a new concept and when this is combined with teacher interventions and the work of a school psychologist we are not really in new territory. However, the purpose of this article is to re-emphasise the importance to educational practitioners of visual-perceptual difficulties that may or may not be specifically related to dyslexic-type difficulties, and the impact on students with learning difficulties, especially in the area of reading.

Dyslexic-type difficulties with reading are well documented (e.g. Snowling, 2008) but a detailed consideration of the

literature is not possible within the confines of this article. Dyslexia is widely regarded as being a predominantly reading-based disorder or, according to Helen Irlen (personal correspondence, February 2010), 'the International Dyslexic Association has taken ownership of the term "dyslexia" and defined it as a language-based disability'. However, while these approaches are appropriate, in many cases the visual aspect to the problem of 'dyslexia' is often given scant coverage when it comes to identifying reading difficulties, despite many studies that have been published which demonstrate that visual-perceptual difficulties may be separate from dyslexic-type difficulties (Whiteley and Smith, 2001; Kruk *et al.*, 2008).

## Visual-perceptual difficulties

Difficulties with vision in relation to reading have been documented over a number of decades and this is exemplified in the following quotation: 'Dick was able to recognize a word printed on a yellow sight card, but not the same word when printed on a white one, or when the print varied' (Jansky, 1958, p. 112). In the report Jansky was not directly referring to visual difficulties per se as affecting Dick's reading; instead this was a general description of what he had difficulties with and how they stopped with a change in the colour of the sheet made by the author. The issue of specific visual and perceptual difficulties that could affect reading did not come to direct prominence until Olive Meares, a New Zealand teacher of secondary special education, noticed certain problems that many of her poorly performing students seemed to have with reading. It was noticed that the reflective brightness of black letters on white print which would have been used in most texts at that time, and is still popular today (consider this article, for example), posed particular difficulties for the students.

Meares (1980) noticed that many of the students whom she worked with had similar visual difficulties in trying to focus on the words, let alone the actual task of decoding the text so as to read it. Therefore, if the students were having difficulty in actually seeing what was on the page then it follows that the next stage of the reading process, that is, decoding, would become more complicated than for other students without visual difficulties of this type. Meares suggests that visual issues such as:

'blurring, moving, jumping, flickering, print distortions are indeed a visual reality for many children . . . This is due to perceptual instability stemming from and induced by the conventional figure/ground organisation of books i.e. black print on a white page' (Meares, 1980, p. 14).

Subsequent studies (e.g. Irlen, 1991; Whiteley and Smith, 2001; Bouldoukian *et al.*, 2002) have also indicated support for these types of description from students across different countries, thus indicating that teaching peculiarities in specific countries or languages are not particularly relevant.

In the USA, Irlen (1983) put forward research evidence which suggested that the thinking of the time regarding dyslexia being a non-visual difficulty was wrong and that the research 'has yielded results that redirect attention back to a specific visual-perceptual dysfunction as a factor in dyslexia' (Irlen, 1983, p. 1). It was from this conference presentation to the American Psychologist Association that the term scotopic sensitivity syndrome (SSS) was put forward as a term to describe these types of visual difficulty that some adults (age range 18–49 years) had in reading text. However, this term is not commonly used in the current literature and the favoured term tends to be Meares–Irlen syndrome (MIS) (e.g. Evans *et al.*, 1996; Bouldoukian *et al.*, 2002; Kriss and Evans, 2005; Kruk *et al.*, 2008), which gives equal credit to the original, although working independently, researchers in this area.

## Dyslexia or Meares–Irlen syndrome

The continuing debate on what exactly constitutes dyslexic-type difficulties and how they should be defined (Elliott and Gibbs, 2008; Riddick, 2010) is relevant to this article due to the potential overlap between dyslexic-type difficulties and those of MIS. It would be outside the scope of this article to attempt to give justice to the international debate around what exactly makes up dyslexic-type difficulties but the working definition of the British Psychological Society is worth bearing in mind for this section:

'Dyslexia is evident when accurate and fluent word reading and/or spelling develops very incompletely or with great difficulty. This focuses on literacy learning at the "word level" and implies that the problem is severe and persistent despite appropriate learning opportunities. It provides the basis for a staged process of assessment through teaching' (BPS, 1999, p. 18).

This particular definition is deliberately broad so that the modality of difficulty is not particularly relevant, thus meaning that the cause of the dyslexic-type difficulty would only be taken into consideration for the recovery programme for each student. MIS is only really relevant as a visual-perceptual difficulty and it could thus be argued that the only connection between MIS and reading difficulties is that of the subcategory of visual dyslexia (see Evenatt, 2002, for a wider discussion of this concept).

In an extensive study of the connections between MIS and dyslexia, Kriss and Evans (2005) considered whether these two concepts were separate or the same condition. Their study consisted of 64 children with a mean age of 9.4 who were equally split between a control and a dyslexic group. The groups were given a coloured overlay intervention (Wilkins, 2001) which has been demonstrated to work with students who have been identified as having MIS (Irlen and Lass, 1989; Jeanes *et al.*, 1997; Whiteley and Smith, 2001; Ludlow *et al.*, 2006) in order to see if there was a difference between the two groups' responses to the intervention. The results indicated that 'MIS and dyslexia are separate conditions which may be present in isolation or sometimes co-exist in the same individual' (Kriss and Evans, 2005, p. 362). The clear statement from this research is that different types of dyslexic-type difficulty are always separate from MIS and that there is no specific overlap notwithstanding the possibility of the same person having both conditions at the same time. In a similar way to how dyslexia (as well as other conditions such as dyspraxia, ADHD, etc.) is viewed by teaching or psychology practitioners, Kriss and Evans suggest that a continuum exists for this condition and is most likely when considering the level of difficulty in reading caused by MIS.

It is worth noting that one of the early pioneers in this area would be in disagreement with the finding that dyslexic-type difficulties are a separate condition from MIS. In personal correspondence (February 2010) with this article's first author regarding overlap between visual dyslexia and MIS, Helen Irlen states that '*I often say that those with Irlen Syndrome may be misdiagnosed with dyslexia. Yes, I do think that visual dyslexia and Irlen Syndrome are one and the same thing*'. As will be discussed later in this article, the notion of whether a particular label is actually useful or not is a moot point and may miss the important aspect which is that the underlying difficulty with reading still exists no matter the terminology that is used; ergo it is the identification and future improvement that is key, not a label (see Lauchlan and Boyle, 2007, for further discussion on labelling in special education).

## Efficacy of coloured overlay intervention

Usually if a person has difficulties with vision this would be picked up at some level by an optician but in the case of MIS it is unlikely to be noticed using the standard tests. In order for MIS to be identified it would have to be picked up by an optometrist who would use tests that are more suitable for this type of visual-processing difficulty. As has been mentioned earlier in this article the identification of visual-perceptual difficulties in reading is not particularly complicated and does not involve much time from the school psychologist. Upon identification of MIS (see the section on practice for a more detailed discussion) there is a simple method of using coloured overlays on the text (Irlen and Lass, 1989; Wilkins, 2001) in order to reduce the amount of glare that usually exists with black print on white

paper. According to Wilkins (2001), the Intuitive Overlays product allows the student to select the coloured overlay that provides the most comfortable viewing of the text and this will, of course, differ from student to student. It should be noted that there is a recent argument (AAP, 2009) which refutes the effectiveness of this type of intervention, which is discussed in more detail elsewhere in this article.

Kruk *et al.* (2008, p. 44) suggest that:

‘The best treatment for people with MISViS and dyslexia is to correct the MISViS and then encourage the general education strategies, such as those designed to strengthen phonological processes and fluency in word recognition, to address the reading disability’.

In that study Kruk *et al.* used the term MIS with Visual Stress to give MISViS, which was essentially in order to emphasise the visual component of the condition but, for the purposes of this article, it is synonymous with MIS. As is suggested, the main approach is to attempt to remediate the difficulties of MIS and research has shown that the coloured overlay method can be significantly successful, as will now be discussed. Bouldoukian *et al.* (2002) investigated the effect of prescribed overlays on the rate of reading for both children and adults and found that ‘individually prescribed filters can have a beneficial effect . . . on immediate reading performance’ (p. 60). It was suggested that even after ‘correcting ocular motor anomalies’ (Bouldoukian *et al.*, 2002, p. 56) it is possible that some children may still have difficulties with reading despite this type of ophthalmic intervention. However, the important point here is that people with MIS showed significant gains while using coloured overlays when reading.

In a study by Jeanes *et al.* (1997), 93 primary-aged children (who were not identified as having any specific difficulties with reading) were given coloured overlays of their choosing to help with reading and after three months 89% were still using them and 70% said they would like to keep them. The results indicated that ‘children who persisted in using their overlays demonstrated an improvement in reading rate of about eight per cent’ (Jeanes *et al.*, 1997, p. 546). This, again, suggests that a fairly straightforward intervention can yield impressive improvements and assistance to children who have MIS and may also offer benefits by way of reading improvement to other children. Whiteley and Smith (2001, p. 30) suggest that there is ‘a growing body of evidence that suggests that subtle visual deficits should not be ignored’, thereby emphasising the need for greater awareness of visual-perceptual difficulties in reading. Interestingly, Ludlow, Wilkins and Heaton (2006) studied the use of coloured overlays with children on the autistic spectrum and also found significant improvements with the rate of reading.

## Educational practice

The first author of this article has worked as a school psychologist and a secondary teacher for the past nine years in

many schools and noticed that there were many students from both primary and secondary schools who seemed to have visual difficulties with reading of the sort described in earlier sections. It was noticed that some students were poor readers but, in the past, consideration may not have been given to the possibility of MIS being a factor, thus meaning that the principal cause may not have been addressed. Furthermore, if this lack of recognition is prevalent at national level then there may be children and young people who are still struggling with reading due to visual-perceptual difficulties despite the reasonably widespread knowledge of MIS/SSS/visual dyslexia as being a potential cause of reading difficulties. The original papers by Meares (1980) and Irlen (1983) and the reasonably popular self-help book *Reading by the Colors* (Irlen, 1991) highlighted problems with the visual aspect of reading that are just as relevant today as they were almost 30 years ago.

A seemingly perennial problem in identifying this type of difficulty is that the students themselves may not be aware of there being anything visually wrong with their ability to read what is on the page. This may be because the students think that other readers (and teachers, parents, etc.) share their experience of the words being distorted in some way. Meares (1980, p. 14) highlights this issue by suggesting that you have to ask questions about the print in order to elicit the issues of vision and then it is possible to discover that:

‘blurring, moving, jumping, flickering, print distortions are indeed a visual reality for many children . . . this is due to perceptual instability stemming from and induced by the conventional figure/ground organisation of books i.e. black print on a white page’.

A separate study also indicated that students regarded as ‘normal’ visual distortions on print (Kriss and Evans, 2005) which could be because they have grown up with these experiences and thus may only question them at later stages in schooling, when more awareness of others’ abilities has developed.

The potential ramifications of not being able to read due to unidentified visual-perceptual difficulties are severe in that this can cause lifelong difficulties in many facets of a person’s existence and these would likely include work, study and social aspects. All of these will have a powerful effect on well-being and may cause disenfranchisement from activities in which the person might otherwise have been interested in participating. However, the irony is that the visual-perceptual difficulties that are specifically mentioned in this article are not labour intensive or particularly complex to identify and simple checks by the school psychologist or a class teacher could provide real changes to the life of a student. For example a very simple checklist in order to identify MIS would ask for ‘yes’ or ‘no’ responses to the following questions:

- ‘Do you skip words or lines when reading?’
- Do you reread lines?



- Do you find it harder to read the longer you read?
- Do you blink or squint?
- Do you get headaches when you read?' (Irlen, 1991, p. xi).

The above questions are a selection of the self-test that Irlen uses to identify MIS in children and adults and if the reader answers 'yes' to three or more of these questions then it may be possible that MIS could be affecting their ability to read. The above list is not exhaustive and there are other statements or questions that could be added but the important aspect is the simplicity of the type of questioning, which is unobtrusive yet could yield valuable information.

The question of teachers and school psychologists being fully aware of this type of difficulty and the simple methods of identifying and rectifying the situation to a reasonable level (see the previous section for a full discussion on improvement programmes) is one that needs to be raised. There is scant coverage of MIS in journals targeting practising teachers or university lecturers working in the area of teacher training, which is clearly an issue *vis-à-vis* teacher knowledge of this type of difficulty. However, there has been sporadic coverage in previous years in special needs journals (e.g. Stone and Harris, 1991; Francis *et al.*, 1992). The first author of this article has heard many anecdotal comments that there is no scientific evidence of MIS and the coloured overlay 'treatments'. However, as has been shown in this article, there are many methodologically robust studies that quite clearly indicate support for these types of intervention as significant improvements in reading are evident (Jeanes *et al.*, 1997; Bouldoukian *et al.*, 2002; Kruk *et al.*, 2008).

Notwithstanding the previous evidence that has been put forward, a joint paper was published in *Pediatrics* by the American Academy of Pediatrics, Council on Children with Disabilities, American Academy of Ophthalmology, American Association for Pediatric Ophthalmology and Strabismus and American Association of Certified Orthoptists (AAP, 2009), which indicated a different position to the link between learning 'disabilities', dyslexia and vision. They suggested that the assumption that dyslexia is a language-based disorder is accepted by most experts. On the subject of visual difficulties with reading the AAP states:

'scientific evidence does not support the efficacy of eye exercises, behavioural vision therapy, or special tinted filters or lenses for improving long-term educational performance in these complex pediatric neurocognitive cognitive conditions' (AAP, 2009, p. 37).

So, there is a discrepancy between that evidence stated and many other studies mentioned in this article which seem to claim that there are improvements in reading with interventions.

Notwithstanding the contradictory arguments in the previous paragraph there still exists a clear argument that wide-

scale screening for MIS should take place in schools, probably at an important transition point such as between primary and secondary. However, in putting forward that particular transition point there is also the concern that some students may have had difficulties with reading that are visually orientated for a considerable length of time, and by the time of the move to secondary schooling the student may already have decided that reading is not a task to be pursued because of the inherent difficulty in attempting to master this subject; that is, reading is seen as a chore and not something to be done for pleasure. There are many challenges to the self-competence component of self-esteem during transition; that is, an individual's belief that he or she can cope with the challenges that lie ahead in this new environment. Central to this is the nature of the learning situation (Jindal-Snape and Miller, 2010) and such difficulties might be exacerbated due to a lack of earlier intervention.

It follows that if there is lack of formal identification or recognition of MIS, although the primary school teacher might have worked with the child and understood the importance of a particular overlay for an individual child, this information might not be passed on to the secondary school during transition or even when passed on might not be acted upon by the secondary school teacher. It has been suggested that communication between teachers from different schools, and also with other professionals such as counsellors or school psychologists, is very important and can play a large part in determining whether a transition is smooth or not (Jindal-Snape, 2010); hence the importance that is given to school psychologists being involved in transition meetings between primary and secondary. Among the many discontinuities are the significant changes in the nature of teaching and learning experiences. If a child who has been used to overlays in primary school is then not provided the same opportunities in secondary school, there is the potential that he or she might experience a dip in reading attainment and an overall lowering of self-confidence, thereby affecting his or her willingness to attempt further work and cope with the compulsory year-by-year changes to the stage of his or her schooling (Jindal-Snape and Miller, 2010).

From the point of view of educational practice, consideration must be given to the possibility of students being identified as having a general dyslexic-type difficulty or even a reading difficulty without the coveted 'dyslexia' label. The thrust of this article is to highlight the issues of the visual-perceptual aspect of reading difficulties and to ensure that this possibility is considered when a student is having difficulties with reading. As has been mentioned, a simple checklist and/or interview with the student could be enough to highlight any difficulties with the visual aspect of reading, thereby instigating further intervention. The overuse of the dyslexia label could hide the primary source of the reading difficulty and it is unlikely that the usual language-based dyslexia interventions would make any dif-

ference to students who have MIS, so teachers should take cognisance of this in their general practice.

School psychologists' practice will vary depending on the state, in Australia and internationally, with some services operating more of a consultation model, where the school psychologists may in some cases have very little direct work with children and young people. The nature of MIS would suggest that direct intervention by a school psychologist in conjunction with the class teacher is relevant and appropriate as both are best placed and qualified to identify difficulties such as visual perception affecting reading (Boyle and Lauchlan, 2009), and if a less active approach is pursued then it could be argued that some children who may have MIS will not be identified and thus not helped. It should follow that school psychology services are at the forefront of assisting schools in screening all children at various stages of schooling. As Irlen (personal correspondence, February 2010) states, 'The educational establishment, for the most part, is still not aware of dyslexia and even less aware of Irlen Syndrome'. It is hoped that with teachers becoming more aware and referring students to school psychology colleagues, identifying these types of visual difficulty should become more common practice, thus potentially offering help and assistance to students whose difficulties may, hitherto, have gone unnoticed.

## Conclusion

This article has considered the current issue of visual-perceptual difficulties, in particular MIS, and the impact that this has may have on the students' general school work if not properly identified. Further consideration was given to the potential for school psychologists and teachers wrongly to identify dyslexic-type difficulties when there is a visual-perceptual difficulty such as that of MIS, which could possibly be due to a lack of knowledge of the latter and the higher level of publicity that surrounds the former. It has been indicated in this article that there is continual debate as to the validity of using coloured overlays to alleviate visual-perceptual difficulties with reading, with the joint statement from vision specialists from the USA stating that there was no scientific evidence that this was effective (AAP, 2009). However, there were also several papers that suggested evidence to support this method of intervention and which put forward the belief that many students could read better with this type of targeted intervention.

This article should provide awareness within both the teaching and school psychology professions that there may be many students who have difficulties with reading which may have been identified either correctly or not as dyslexia, but in fact may be MIS, which requires a particular type of intervention that would not be within the usual reading interventions. MIS is easily identifiable if teachers and other professionals consider this as one criterion in their guiding hypotheses when attempting to alleviate reading problems. While the authors are not advocating that teachers use diag-

nostic tools, they are suggesting that a heightened level of awareness of this type of difficulty is necessary when working with students who have difficulties accessing the curriculum due to issues with reading.

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