Specific Learning Difficulties (SpLDs) and Visual Difficulties

A Guide for Assessors and SpLD Practitioners

SASC Working Group June 2018

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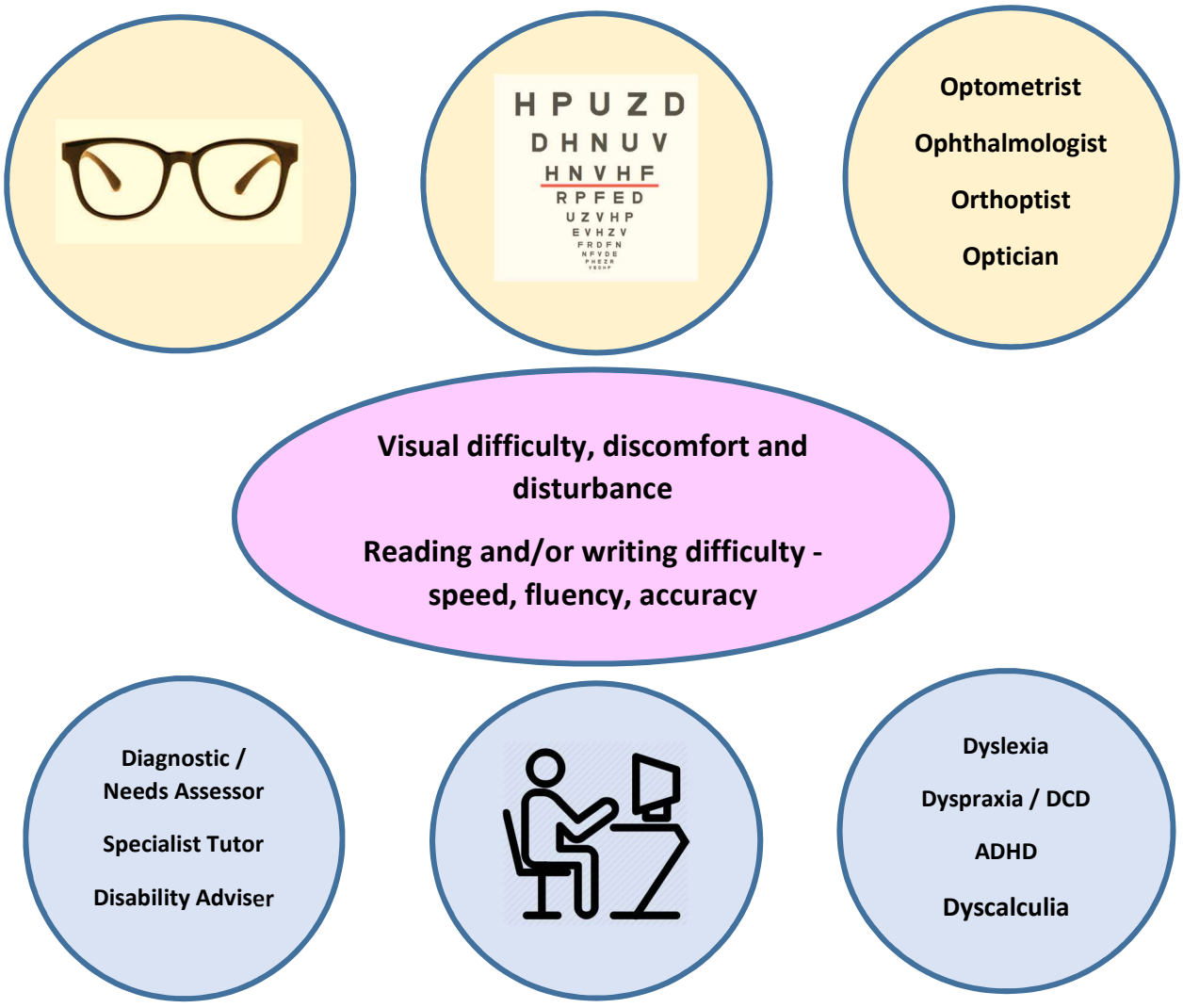

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Executive summary

Key messages:

- SpLD professionals and vision specialists have much to learn from each other.
- For the safety of the client/student, possible pathological or other causes of visual discomfort and disturbance need to be ruled out by a vision professional.
- Symptoms that previously may have been seen as associated with 'visual stress' could be caused by uncorrected refractive error and/or oculomotor issues. Specialist assessors/practitioner psychologists cannot assess for these.
- Visual stress should **not** be used as a catch-all term for visual difficulties.

Assessors should:

- Check that there has been a standard eye test within the past two years.
- Ask detailed questions about visual difficulties (use new screening protocol).
- Refer students / clients to an optometrist *before* a full diagnostic assessment if screening questionnaire reveals a need for further visual assessment.
- Be aware of, but not attempt to diagnose, the range of visual difficulties which may impact reading.
- Be aware that there is no strong evidence of a particular association between visual stress and dyslexia / SpLD.
- Carefully consider diagnostic conclusions; where there is evidence of visual difficulties but no substantive evidence of SpLD, refer for further visual assessment rather than conclude dyslexia.

Assessors should not:

- Refer to Irlen or Meares-Irlen syndrome or scotopic sensitivity syndrome.
- Conduct coloured overlay tests.
- Diagnose visual stress.

Impact of changes – a SWOT analysis:

Strengths: • Better knowledge and understanding of how visual difficulties may exacerbate SpLDs but may not be diagnostically related. • Clarity of responsibilities	**W**eaknesses: • Both SpLD professionals and optometrists need better understanding of the impact of visual difficulties on literacy and on dyslexia. • Current referral routes for visual assessment, especially in HEIs.
Opportunities: • Cooperation between two crucial professions • Development of network of interested professionals	**T**hreats: • Cost of extended optometric examination • Students may miss out on the right support due to cost

Specific Learning Difficulties (SpLD) and Visual Difficulties

1.1. The assessment and diagnosis of SpLDs in Higher Education is conducted according to the SpLD Working Group / DfES Guidelines (SASC, 2005), which includes a list of tests for assessment that is updated at regular intervals – the most recent version of this guidance is SASC (2016). The Guidelines undergo regular revision by the SpLD Assessment Standards Committee (SASC).

1.2. The SpLD Guidelines (SASC, 2005) identify the following conditions as specific learning difficulties:

- dyslexia,
- dyspraxia or developmental coordination disorder (DCD),
- dyscalculia,
- Attention Deficit Hyperactivity Disorder (ADHD) is described as a neurodevelopmental disorder characterised by features of both a mental health condition and a specific learning difficulty.

1.3. The introduction to the 2005 Guidelines indicates that there is considerable overlap in characteristics of these four conditions, and that difficulties implicated in SpLDs may include acquiring fluent reading and writing skills and/or manipulating numbers, problems with working memory, phonological processing, processing speed, organisational skills, motor co-ordination and maintaining concentration.

1.4. The 2005 Guidelines suggest there may also be an increased likelihood of visual difficulties in some conditions. In relation to dyslexia in particular, the Guidelines state that “marked and persistent weaknesses may be identified in working memory, speed of processing, sequencing skills, auditory and/or visual perception, spoken language and motor skills” (p5).

1.5. Particular vision-related difficulties, which are identified in the 2005 Guidelines as being generally associated with SpLDs, are “poor motor control resulting in a range of difficulties including ... inaccurate reading”, and problems with “reading text due to visual distortions such as blurring or moving letters” (p7).

1.6. Many learning activities, especially in higher education, involve extensive use of visual material that requires intensive study. This means that students who experience problems with their vision are likely to face difficulties in the learning environment, whether or not they are identified as having SpLD.

1.7. Students being assessed for SpLD may present with visual difficulties which may exacerbate their difficulty with learning from visual material, even if these are not necessarily associated with the condition defining their SpLD,.

1.8. The main responsibility of SpLD assessors is to diagnose SpLD and to provide recommendations for support. The SpLD assessment model typically involves a single assessor carrying out a diagnostic interview, administering a range of tests and reaching a diagnostic

conclusion. However, assessors are also advised to consider, where appropriate, referral to a range of educational and health-related professionals who, together, can provide the necessary expertise to reach a correct diagnosis and offer appropriate support.

1.9. SpLD assessors therefore need to be aware of the possibility that **difficulties with study and learning may in some cases be exacerbated, or possibly even caused, by a vision-related problem**. In such cases assessors should be able to identify the existence and general characteristics of such problems, so that students can be referred to professionals qualified to diagnose and manage conditions affecting the eyes and vision.

1.10. The remainder of this Guide

- summarises the symptoms, causes, assessment and management of commonly occurring visual difficulties that may have an adverse effect on the ability to study and learn
- outlines the principal differences between current and previous guidance on vision problems with SpLD
- provides guidance on i) how to assess, ii) to whom to refer for further assessment, and iii) how to write a referral letter.

Symptoms of Visual Difficulties (Discomfort & Visual Disturbance)

2.1. Visual difficulties that overtly affect a student's performance will typically give rise to symptoms of discomfort and/or visual disturbance that are usually, though not always, associated with the activity of reading or sustained study of visual material at near working distances.

2.2. Such visual discomfort and disturbance is generally called **eyestrain** or **asthenopia**, and it is a long-recognised problem. Take, for example, the following description by Derby (1862) in the Boston Medical and Surgical Journal:

> *… reading, writing, or any other employment requiring near objects to be viewed, induces fatigue; objects become confused and indistinct, and a sense of tension is felt above the eyes. Such a height does this reach, that temporary relinquishment of the employment is rendered necessary. After resting a few moments, vision becomes again distinct, but the same symptoms develop themselves again sooner than before. As long as the eyes are not employed on near objects vision appears normal, and no disagreeable sensation is experienced. No sooner, however, does the patient … attempt to continue his previous occupation, than the symptoms become more and more pronounced ; … Has too persistent an effort been made, all work on near objects must be given up for a considerable period.*

The term asthenopia covers both 'internal' vision-related symptoms of the sort described above (fatigue, headache, perceptual confusion and blurred, unstable or double vision) and 'external' ocular symptoms (general eye ache or specific sensations of dry, watery, burning or itchy eyes). The extract above specifically describes asthenopia associated with concentrated near work; that is, work at a viewing distance of 40cm or less. It is in this context that many schoolchildren and students experience visual discomfort and disturbance.

2.3. A number of studies provide estimates of asthenopia prevalence of in schoolchildren. Vilela et al. (2015a) conducted a systematic review and meta-analysis to estimate asthenopia prevalence in children aged 0-18 years. From five eligible studies involving 2465 children, the pooled prevalence of asthenopia was **19.7%.**

2.4. Although comparable studies of asthenopia prevalence for students in further/higher education are not available, we might expect similar findings in this population, whose study activities are defined by the requirement for intensive near work. It is also the case, of course, that most if not all students engage in intensive near work persistently through use of computers and portable devices. Vilela et al. (2015b) conducted a systematic review and meta-analysis to estimate asthenopia prevalence and risk factors associated with use of computers by adults. From 22 eligible studies the pooled prevalence of asthenopia was **40.4%.**

2.5. Results cited above indicate that **a relatively large proportion of children and adults undertaking intensive near work, which will include reading** along with a wide range of computer-based tasks, will experience symptoms of visual discomfort and disturbance.

2.6. Note that the studies cited above did not include individuals with learning difficulties. However, Evans et al. (1999) reviewed the management of 323 consecutive patients attending a learning difficulties clinic. The sample involved both children and adults (age range 4-73 years), 69% of whom had been diagnosed as having specific learning difficulty, and 48% of these individuals reported more than two symptoms of visual discomfort and/or disturbance, while 19% reported more than four.

2.7. Taken together, the studies cited indicate that **prevalence of visual discomfort and disturbance in the general population, both children and adults, is high. It is at least as high in those who have specific learning difficulty.**

2.8. It must be emphasised that the finding of visual difficulties in people with specific learning difficulties does not imply that one difficulty causes the other, nor does it mean that treatment of visual difficulties is also treatment of learning difficulties. However, if people with SpLD also have visual symptoms then it follows that these are likely to exacerbate their difficulty with learning from visual material.

Causes of Visual Difficulties

3.1. In a minority of cases, visual discomfort and disturbance may have a pathological cause. For this reason alone, it is essential that all assessment and diagnosis should be undertaken by professionals who are not only qualified to assess and treat conditions affecting vision, but also qualified to recognise pathologies of the eyes and the visual system, and their effects.

3.2. Pathological conditions occasionally encountered in children and young adults, which may cause symptoms of visual discomfort and/or disturbance, include those affecting the optical media of the eye such as keratoconus and cataract, ocular inflammatory conditions such as uveitis, and pressure-related conditions such as glaucoma and intracranial hypertension. Conditions affecting vision are often consequences of systemic conditions such as diabetes, myalgic encephalomyelitis (ME), or multiple sclerosis (MS). The prevalence of pathologies affecting vision in students is relatively low, but the possibility must not be overlooked.

3.3. Assuming that pathology is ruled out, then we expect to encounter three types of functional problem that can give rise to symptoms of visual discomfort and disturbance which may adversely affect performance of visual tasks, including learning from visual material. These conditions, which may occur separately or together, are:

- refractive error (myopia, hyperopia, and astigmatism)
- oculomotor dysfunction (focusing and eye coordination problems)
- visual sensory anomalies (photophobia and pattern-related visual stress)

Figure 1 provides a summary, and indicates common symptoms associated with each condition, though the association between symptoms and their cause is often not so specific. The two-way arrows between refractive and oculomotor problems in Figure 1 indicate that refractive error is an important element in the cause and treatment of oculomotor problems and, conversely, that oculomotor status should be taken into account in the correction of refractive error.

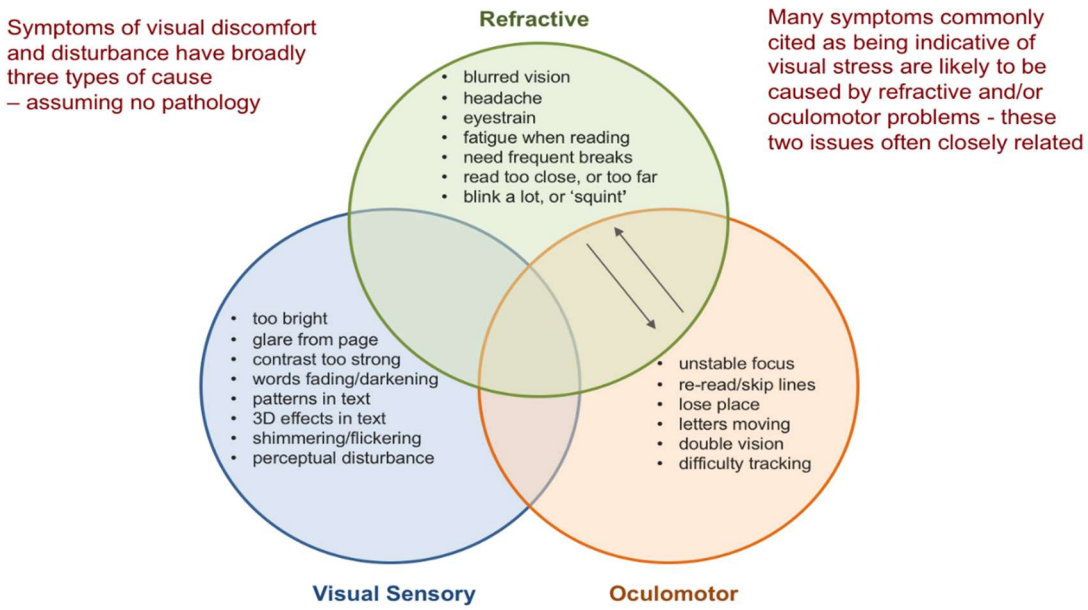

Figure 1 Non-pathological causes of visual discomfort & disturbance

Refractive Error

3.4.1. This is the most common cause of poor vision (reduced visual acuity) and visual discomfort, and, in most cases, it is easily corrected with spectacles or contact lenses.

3.4.2. There are three types of refractive error:

- myopia (short-sight) in which vision is typically poor in the distance but clear when the object of interest is sufficiently close to the eyes,
- hyperopia (long-sight) in which vision may be good or poor for distant and/or near objects, and
- astigmatism in which, once again, vision may be good or poor at different distances.

3.4.3. Myopia, and astigmatism associated with myopia, typically results in reduced visual acuity for distance vision, but is generally not associated with visual discomfort unless it occurs in conjunction with oculomotor or visual sensory anomaly.

3.4.4. Hyperopia, and astigmatism associated with hyperopia, may result in reduced visual acuity and/or visual discomfort. This is because the eyes are able to change focus (accommodate) to maintain clear vision in these conditions, but this requires sustained muscular effort which may result in discomfort, typically in the form of headache and eyestrain. **This characteristic is especially important in educational settings because the effort required to maintain clear vision in these conditions increases as objects come nearer to us.** Students with uncorrected hyperopia or hyperopic astigmatism, who may spend many hours each day on intensive close work, are at high risk of experiencing visual discomfort from the effort of having to accommodate more than normal over long periods. In addition, difficulty in sustaining the required level of accommodation will often result in objects appearing to go in and out of focus, so students with this condition may report visual disturbance and/or visual discomfort depending on how well they are able to sustain the effort required to keep near objects in focus.

3.4.5. For the reasons given in the previous paragraph, **it must not be assumed that people only need spectacles if they have poor vision, or that the purpose of spectacles is always to make vision clearer**. Very often, spectacles are required for people who have good visual acuity but who have difficulty with focusing and/or coordinating the two eyes to maintain clear and comfortable vision when working at near distances over a sustained period of time.

3.4.6. Recent studies, using lenses to create refractive errors in 10 year-old children, have shown significant impairment in reading, visual information processing and reading-related eye movement performance with both hyperopia (Narayanasamy et al., 2015a) and astigmatism (Narayanasamy et al., 2015b).

3.4.7. Because uncorrected refractive error can result in both visual discomfort and disturbance, and may cause or exacerbate difficulties with academic performance, **the assessment and appropriate correction of refractive error should always be the first priority** in helping people with visual difficulties that affect the ability to study and learn.

3.4.8. Note that, under UK law (Opticians Act, 1989), sight-testing and prescribing for the correction of refractive error may only be undertaken by fully-qualified and registered professionals, specifically either medical practitioners or optometrists.

3.4.9. Refractive error resulting in symptoms of visual discomfort / disturbance is common, but no more so in people with dyslexia than in the non-dyslexic population.

Oculomotor Dysfunction

3.5.1. This term refers, for the most part, to problems with the ability to focus on near objects (accommodation) and with the coordination of the positions of the two eyes in binocular vision (convergence). Both functions rely upon the actions of muscles, which are located, respectively, inside and outside the eye.

3.5.2. Dysfunction affecting accommodation and convergence is common and, in almost all cases, results in visual discomfort in the form of headaches and eyestrain, and visual disturbance typically in the form of objects appearing blurred or going in and out of focus and/or moving, drifting or appearing double.

3.5.3. Problems with accommodation and convergence are common in children and students who experience difficulties with reading and academic performance. For example, Grisham et al., (2007) assessed 461 children, average age 15 years, who had been identified by their schools as poor readers, and found that **80%** of the sample had clinically significant weaknesses in accommodation, convergence and/or binocular fusion abilities.

3.5.4. There is a close physiological relationship between accommodation and convergence, such that change in one inevitably influences the other, and this relationship is affected by refractive error. Therefore it makes no sense to assess any one of these functions without also assessing the others. Often the treatment of oculomotor anomalies involves refractive correction so, once again, the assessment and management of these problems needs to be undertaken by vision professionals who understand them and are qualified to treat them.

3.5.5. Regarding treatment for oculomotor problems, some forms of accommodation and/or convergence dysfunction can be successfully treated by what is widely known as *vision therapy* (Ciuffreda, 2002), which is also sometimes called optometric vision therapy, though the same methods may be used by orthoptists and ophthalmologists. This is essentially a combination of appropriate refractive correction together with physiotherapy to strengthen the muscles involved in accommodation and convergence.

3.5.6. It has been estimated that about 15% of people with dyslexia have binocular instability, but the condition is unlikely to require treatment in every case as it will not necessarily be associated with symptoms (Allen et al., 2010). If symptoms are present in dyslexic students

with binocular instability, this does not mean that the binocular instability is causing the reading difficulty. Rather, the binocular instability is likely to be a co-occurring condition.

Visual Sensory Anomalies

3.6.1. Visual sensory anomalies are conditions in which there is an unusually high degree of sensitivity to aspects of the visual stimulus such as overall light level (photophobia) or pattern characteristics and contrast (visual stress).

3.6.2. Photophobia is common, and is associated with a wide range of conditions some of which are pathological (Digre and Brennan, 2012). Individuals who experience severe and debilitating photophobia should always be referred for professional assessment. The term *visual stress* describes a hypersensitive response to high-contrast pattern (Wilkins, 1995). Due to its association with patterned stimuli, visual stress may also sometimes be called pattern glare or pattern-related visual stress.

3.6.3. The terminology around visual stress is rather problematic. Sometimes the term is used loosely or generically, particularly by those with no detailed understanding of anomalies of vision, as an umbrella term to refer to any condition that gives rise to visual discomfort and disturbance. **This approach is inappropriate and is strongly discouraged.**

3.6.4. A related issue is that the same condition is often referred to using terminology centred on that introduced by Irlen (1983), which has since been in use to promote her own methods of assessment and treatment. These terms, which include Scotopic Sensitivity (Syndrome), Irlen Syndrome, and Meares-Irlen Syndrome are generally not supported by the scientific and clinical communities, and so **the use of Irlen-related terminology is now strongly discouraged**.

3.6.5. The symptoms arising from visual (sensory) stress include both discomfort and disturbance, often along with an aversion to the visual stimulus, particularly if this involves a bright source of light or high-contrast pattern – hence the use of terms pattern glare and pattern-related visual stress.

3.6.6. It is important to appreciate that seemingly unusual or disconcerting responses to certain patterned stimuli are typical in normal vision. Figure 2, for example, shows a classic visual effect in which illusory grey spots are seen at the white intersections in a grid pattern, and the spots appear and disappear as we move our eyes around the stimulus. Effects such as these are of the sort that may lead some who do not understand vision to conclude that they indicate the presence of 'visual stress', when in fact they are perfectly normal consequences of how the visual system responds to contrast in certain types of pattern.

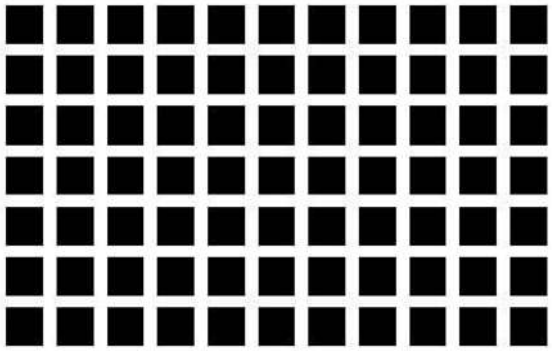

Figure 2 Seeing illusory spots in some types of visual pattern is normal

Similarly, Figure 3 shows a pattern that produces an illusion of movement. Once again this is a characteristic of normal visual perception that should not be interpreted as an indication of visual stress.

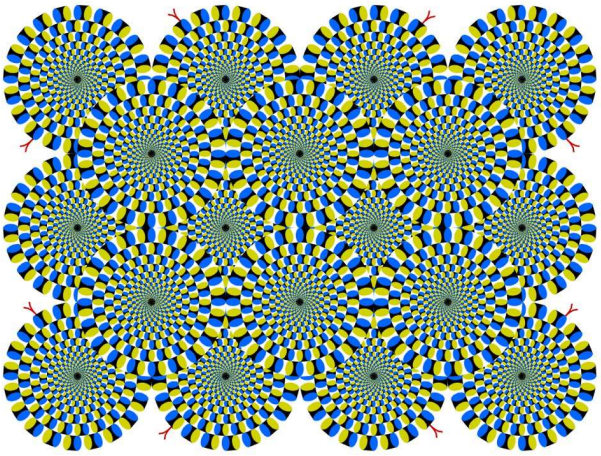

Figure 3 Seeing illusory movement in some types of visual patterns is normal

3.6.7. Not only does the visual system process pattern in ways that produce unexpected effects in normal vision, it is also the case that high-contrast regular patterns with repeating elements (as in Figure 2), which are likely to stimulate such effects, are ubiquitous in the environment. Not only is it common to experience unusual but normal visual disturbance with some such patterns, they may also cause discomfort and an aversive response in some individuals (Fernandez and Wilkins, 2008).

3.6.8. We must be wary of misinterpreting the normal visual response to pattern as an indication of visual stress. However, when individuals viewing such patterns report **atypically high levels** of discomfort, disturbance and aversion with patterned stimuli, then we might consider them to have a degree of hypersensitivity and susceptibility to visual stress when viewing patterned stimuli.

3.6.9. The seemingly high prevalence of visual stress in people with reading difficulty can be seen as a manifestation of hypersensitivity to pattern, because conventional black-on-white text often has the pattern characteristics most likely to provoke high levels of discomfort and perceptual disturbance in susceptible individuals (Wilkins et al., 2004).

3.6.10. Wilkins et al. (2004) also provide a rationale for the use of colour to alleviate the symptoms of visual stress, a possible mechanism being that coloured filters may help to reduce the level of excitation to high contrast patterns.

3.6.11. The work of Wilkins and his colleagues cited above (Wilkins, 1995; Wilkins et al., 2004) shows why pattern-related visual stress might have an adverse effect in the reading task. It will not therefore be surprising if some people with reading difficulties are affected by visual stress. However the association of visual stress with dyslexia is not so clear. Estimates of the

prevalence of visual stress in people with and without dyslexia were reported by Singleton & Trotter (2005) and Kriss & Evans (2005), but such estimates are problematic because the criteria for defining and diagnosing visual stress are not definitive, nor indeed are the criteria for diagnosing dyslexia. Therefore, rather than assuming that visual stress is to be expected in students with dyslexia, a more prudent approach would be to make no prior assumptions but instead concentrate on establishing whether there are visual symptoms worthy of further investigation, regardless of their possible association with SpLD.

3.6.12. Notwithstanding the difficulty with definitions and diagnostic criteria for dyslexia and visual stress, a recent study supports the existence of visual stress as a co-occurring factor in around **20%** of people with dyslexia (Evans and Allen, 2016).

Assessment and Management of Visual Difficulties

4.1. Based on the descriptions of visual problems given above, we expect that conditions that overtly affect a student's performance will typically give rise to discomfort and visual disturbance, and usually, though not always, these will be exacerbated by tasks that involve sustained/intensive study of visual material.

4.2. A basic principle, to which we should adhere, is **no symptoms, no treatment**. This means that we need to rely upon students either reporting their visual symptoms spontaneously and/or responding positively to a questions about experience of visual symptoms. This guidance document includes a **visual difficulties screening protocol** to enable assessors to establish whether symptoms occur that may warrant further investigation (See Appendix 2).

4.3. It is strongly recommended that assessment of possible visual problems associated with academic study should be limited to evaluation of symptoms. There should be **no attempt at diagnosis or treatment**, for the three principal reasons described above.

To reiterate:

- In a minority of cases there may be ocular or visual system pathology, so symptoms should be professionally investigated.
- Similar symptoms may have quite different causes, especially those involving headache and eyestrain, and so a variety of assessments and professional knowledge may be required to reach a correct diagnosis.
- Unrecognised refractive problems are a common cause of symptoms, but the assessment and correction of these can only be undertaken by qualified, registered optometrists or medical practitioners.

4.4. Students identified as having visual symptoms that adversely affect their ability to study should be referred to a qualified, registered professional. The professionals best placed to assess and treat the causes of visual symptoms are **optometrists**. In addition to optometrists, other eye and vision professionals are ophthalmologists, orthoptists and (dispensing) opticians.

4.4.1. **Optometrists** work principally in primary care, in high-street practices, and some work in secondary care in hospitals. All optometrists offer *sight-tests* – this is the legally-defined term for an assessment that involves refraction and a health check that takes account not only the

health of the eyes and visual system but also any ocular/visual conditions that may be indicative of a general health problem, such as diabetes. Some optometrists also offer assessment and treatment of oculomotor dysfunction and visual stress, but these are the minority. For effective implementation of the guidance in this document, it is recommended that students are referred to optometrists who are able to offer all the required assessments, according to the protocol recommended in Appendix 2. A list of optometrists known to comply with these requirements at the present time is to be developed and **SASC would welcome recommendations from assessors.**

4.4.2. **Ophthalmologists** are qualified to undertake medical and surgical treatment of eye disease and dysfunction. If an optometrist detects or suspects that a patient has a pathological condition then they will refer that patient to an ophthalmologist. Many ophthalmologists are sceptical about visual stress, and some are dismissive. Most, especially those who specialise in paediatrics, do recognise the importance of oculomotor problems in vision, and the efficacy of some forms of vision therapy for such problems.

4.4.3. **Orthoptists** typically work alongside ophthalmologists in hospital-based secondary care, and they specialise in assessment and treatment of oculomotor/binocular dysfunctions. Optometrists who do not themselves undertake management of oculomotor problems will often refer patients to orthoptists in secondary care. In some hospital departments orthoptists may also undertake assessment and treatment of visual stress using colour, but this provision is not universal.

4.4.4. **Opticians** (aka Dispensing Opticians) principally supply spectacles to prescriptions provided by optometrists. Some opticians have additional qualifications that allow them to fit and supply contact lenses. They may in some cases also undertake assessment and treatment of visual stress using colour, because this activity is not regulated under law. However, dispensing opticians cannot legally undertake a sight-test (see 4.4.1), nor are they qualified to assess and/or treat oculomotor dysfunctions.

The following table summarises the relevant areas of expertise covered by the (non-medical) eyecare professions:

Optometrist	**Orthoptist**	**(Dispensing) Optician**
Eye Health Refraction Oculomotor Visual Stress Provision of spectacles Provision of contact lenses	Oculomotor Visual Stress	Visual Stress Provision of spectacles Provision of contact lenses (if additionally qualified)

Differences between Current and Previous Guidance

5.1. Previous guidance on visual difficulties for SpLD assessors concentrated mainly on screening for visual stress, as described in an earlier report (available as Moody, 2013).
The new guidance here departs from the previous in the following principal respects.

Principal Difference 1 – If visual symptoms occur frequently or persistently then further assessment should be undertaken by an optometrist even if there has been a recent sight test. The primary need is always for correct diagnosis and management of visual problems, some of which may be due to pathology.

Principal Difference 2 – SpLD Assessors should undertake ***screening*** to establish whether there are visual symptoms that warrant further investigation, but should not undertake any form of specific visual assessment, diagnosis or treatment. In particular, it is strongly recommended that there should be no identification or diagnosis of visual stress. The rationale for this follows from the detailed discussion presented earlier in this document.

Principal Difference 3 – It should not be assumed that there is a particular or unique association between any form of SpLD and the condition known as visual stress, or that visual stress has a particularly high prevalence in SpLD, or that the concept of visual stress is appropriate as a general-purpose description and explanation of visual symptoms that may occur in students and interfere with their ability to study.

Appendix 1: Visual discomfort and disturbance in children and young adults - a guide to causes, effects and treatments

Dr Jim Gilchrist, School of Optometry and Vision Science, University of Bradford, UK.

Studies show that around 20% of children and young adults report symptoms of fatigue, headache, eye ache, and blurred, unstable or double vision associated with reading, writing and other demanding near work. This guide summarises the most common causes of visual discomfort and disturbance affecting schoolchildren and students. Although fairly comprehensive, this does not cover every type of problem. In particular, it does not describe eye diseases which may produce similar symptoms and which must be ruled out before other causes are considered. Children/students with sore eyes and/or any form of visual discomfort or disturbance should be assessed by a registered optometrist.

Cause of problem	Explanation & Effects	Treatments
1. **Refractive Error** The types and effects of refractive error are as follows:	This term means that, when looking into the distance, the image formed in the eye does not fall precisely on the retina. Instead it falls either in front (myopia) or behind the retina (hyperopia), so it is not in perfect focus.	• Refractive errors are corrected with glasses (optical prescription lenses). • Small amounts of refractive error in a person with no visual discomfort or disturbance do not need to be corrected. • Correction of refractive error should be the first consideration in treatment of sustained visual discomfort and disturbance.
1.1 Myopia (short-sighted)	Vision is poor (blurred/out of focus) in the distance. As objects come closer they become clearer, so vision may be clear for reading and writing. The amount of blur in distance vision, and the distance at which objects become clear, depends on the amount of myopia. In high myopia, distance vision will be very poor and near vision may be poor at normal reading distances, so a student may hold a book very close to the eyes.	• Myopia is corrected with glasses. • Some myopes only need to wear their glasses for distance vision. • Some myopes need to wear their glasses all the time, to ensure that their vision is clear and comfortable at all viewing distances.
1.2 Hyperopia (long-sighted)	The opposite of myopia, so we expect vision to be good in the distance and poor at near. Unlike myopia, however, the eye is able to compensate for hyperopia and achieve good near vision by changing its focus (accommodating). However, near vision will only be clear if the student is able to sustain the accommodation required to overcome the hyperopia. The greater the amount of hyperopia the harder it is to achieve and maintain clear vision for reading and writing.	• Hyperopia is corrected with glasses. • Some hyperopes only need to wear their glasses for near work (reading, writing and intensive study) • Some hyperopes need to wear their glasses all the time, to ensure that their vision is clear and comfortable at all viewing distances. • Some hyperopes need to wear glasses <u>even if they can see clearly at distance and near</u>, to ensure that their vision remains stable and comfortable for reading, writing and other near work.

	When a hyperopic person has difficulty sustaining the accommodation required for clear vision, the effects include **fatigue, headache and eye ache, and unstable vision when print appears to go in and out of focus.**	
1.3 Astigmatism	A common condition in which there are two different refractive errors in the same eye. This may be different amounts of myopia or of hyperopia, or even a mixture of myopia and hyperopia occurring together. The effect is that the eye does not focus everything clearly at any distance. When the child is reading, **some parts of the text may be clear while others are blurred**. The greater the amount of astigmatism the worse this will be.	• Astigmatism is corrected with glasses. • As described for myopia and hyperopia, astigmatic students may need to wear their glasses some or all of the time, depending on the amount of astigmatism and its effect on their vision and comfort. • Many people with astigmatism benefit from wearing their glasses all the time.
2. **Accommodation (focusing) dysfunction**	The eyes have to change focus as the viewing distance changes. The lens inside the eye is flexible and encircled by a small muscle – as the muscle contracts and relaxes the shape of the lens changes. This allows the eye to adjust its focusing power for different viewing distances. The closer the object the more power is required. Some students experience accommodation dysfunction, meaning they are unable to adjust their focus effectively to maintain clear and comfortable vision when reading and writing. Effects include **fatigue, headache, eye ache, and print going in and out of focus.** This problem may be exacerbated by uncorrected refractive error (see above).	• Optometrist must assess accommodative function in addition to measuring refractive error. • Sometimes glasses alone will alleviate the problem. • Sometimes accommodation dysfunction may require a programme of eye muscle exercise (physio) therapy, usually in addition to glasses.
3. **Convergence (eye co-ordination) dysfunction**	When two eyes are used, their movements must be co-ordinated to converge and diverge (turn inward or outward) so that both look at exactly the same location. This enables the two separate images from right and left eyes to be combined into one single image. Demands on the convergence system are greater in near vision, so it is quite common to encounter students with	• Optometrist must assess convergence function in addition to measuring refractive error. • Sometimes glasses alone will alleviate the problem. • Often convergence dysfunction requires treatment with a programme of eye muscle physiotherapy, which may be given with or without glasses as appropriate, depending on other findings.

	convergence dysfunction that may result in double vision. In general, the instability in eye coordination associated with convergence problems can account for symptoms such as **double vision, unstable images, skipping words and lines when reading, and words appearing to jump or move around on the page.**	
4. **Interactions (refractive error, accommodation and convergence)**	The three conditions described above are usually considered separately. In reality, however, everyday vision involves a complex interaction between them. Difficulties with any one of these can affect the others such that, sometimes, a child will experience visual discomfort and disturbance that is not fully explained by any one of these factors alone but rather arises due to problems of how they work together. **Difficulties arising from a combination of refractive error, accommodation and convergence dysfunction may produce all of the following effects: fatigue, headache, eye ache, print appearing blurred or going in and out of focus, print appearing double or changing position on the page.**	• Optometrist must assess accommodation and convergence, in addition to refraction, in order to evaluate interactions between them and advise on appropriate solutions. • Treatment typically involves glasses, together with appropriate eye muscle physiotherapy to improve accommodation/convergence interaction.
5. **Visual stress (pattern-related)**	Refractive error is inaccuracy in the eye's optical system, while accommodation and convergence dysfunction are oculomotor (eye muscle) problems. **Visual stress is a sensory condition, in which the visual system appears to be hypersensitive to high contrast regular patterns, including lines of black text against a white background.** Alternative names for this condition are pattern glare and pattern-related visual stress. It is also sometimes, inappropriately, called 'Irlen Syndrome' or 'scotopic sensitivity'. Existence of visual stress is disputed/not recognised by some professionals, notably in medicine. Those who consider visual stress to be a genuine problem report	• Treatment of visual stress typically involves use of colour in the form of transparent coloured overlays placed over reading material, or lenses worn in spectacle frames. • The precise colour required to alleviate visual stress appears to be specific to the individual. • This area of practice is contentious; it is promoted by some professionals but strongly criticised and dismissed by others. • There is broad agreement among eye and vision professionals that investigation of visual stress should be part of a comprehensive assessment

	its association with a variety of symptoms including aversion, fatigue, headache, visual discomfort and distortions or illusions when viewing bright images and high contrast patterns.	covering all the conditions described in these notes, to enable correct differential diagnosis. • **Visual stress is NOT dyslexia, and treatment of visual stress is not treatment of dyslexia.**
6. **Developmental Disorders**	These are conditions which, if not detected and managed correctly, may occur in the early years of a child's visual development. The school vision screening programme for children aged 4 to 5 is principally an effort to detect the following two conditions.	
6.1. **Strabismus (squint)**	Squint is the condition in which, typically, one eye turns in or out while the other looks straight ahead. Development of squint in children is often associated with uncorrected refractive error. As squint is an eye co-ordination problem, it too may result in symptoms of fatigue, headache, unstable images or double vision. Some children with squint, on the other hand, experience no such symptoms but may still have difficulty with near tasks including reading and writing.	• Treatment aimed at correcting a squint typically involves glasses for constant (all day) wear, and may also involve exercises to improve and consolidate correct eye coordination. • Some squints require surgical treatment, which involves relocating external eye muscles to improve alignment of the eyes. Surgical correction is carried out by ophthalmologists, not by optometrists. • Squints are most often managed by ophthalmologists and orthoptists, rather than by optometrists.
6.2. **Amblyopia (lazy eye)**	A condition in which vision in one eye (or, less commonly, both eyes) is poor as a result of impaired development. Amblyopia commonly occurs in association with squint or with anisometropia (a condition in which the two eyes have different refractive errors).	• Treatment involves glasses for constant wear, sometimes combined with periods of covering (patching) one eye, so as to encourage vision to develop in the other.

Appendix 2: Screening Protocol
- with acknowledgement to Moody, Singleton and Jameson

Questionnaire should ideally be completed prior to referral for SpLD assessment in order to allow time for visual difficulties to be assessed/addressed.

Questions on eye and vision history

1. When did you last have an eye test? (within 2 years is recent)

2. Was any prescription made (Yes/No)?
   If YES, were you advised to wear your prescription for distance (e.g. television or driving) or near (e.g. reading) or both?

3. Do you wear your prescribed glasses/contact lenses (Yes/No)?
   If NO, why not?
4. Do you have your glasses/contact lenses with you (Yes/No)?

5. Have you ever used coloured overlays/tinted glasses (Yes/No)?
   If YES,
   a) who advised and provided them?
   b) why were they recommended?
   c) did they help?
      if YES, then in what way?
   d) do you still use them?

Questions on reading / near work activity

1. How many hours reading per day, in a typical week?

2. How many hours on screen (phone, tablet or computer) per day, in a typical week?

3. By how much has your reading / near work time increased since you came to university?

Any other comments/observations?

Visual symptoms questionnaire

20 questions addressing different aspects of visual difficulty as described previously. NB: high contrast pattern and fluorescent lamps may elicit visual disturbance and/or aversive responses in people with no particular visual problem or susceptibility – aspects of the normal response of the visual system to contrast and flicker – so questions about these are not considered indicative.

Visual difficulties should **ideally** be addressed prior to SpLD assessment. In making referrals based on the outcome of this screening questionnaire, assessors are advised that if **any** symptoms occur **often** or **always**, an optometrist referral is **always** recommended. Where symptoms occur only **sometimes** or less frequently, a referral could still be made but it should be made clear to the person being screened that the referral may not confirm any visual difficulty, and SpLD referral is not contra-indicated. Responses mainly **rarely** or **never** do not warrant onward referral.

For this protocol:

- Always = every day
- Often = several times a week but not necessarily every day
- Sometimes = 2-3 times a month
- Rarely = only once every few months / a year

		Never	Rarely	Sometimes	Often	Always
1	Do you get headaches when you read?					
2	Does reading make your eyes feel sore, gritty or watery?					
3	Does reading make you feel tired or sleepy?					
4	Do you become restless or fidgety or distracted when reading?					
5	Do you become less comfortable the longer you read?					
6	Do you prefer dim light to bright light for reading?					
7	Does reading from white paper seem too bright or glaring?					
8	Do parts of the white page between the words form patterns when you read?					
9	Does the print or background shimmer or appear coloured as you read?					
10	Does print appear to jitter or move on the page as you read?					
11	Do you screw your eyes up when reading?					
12	Do you rub your eyes to relieve the strain when you are reading?					
13	Does text appear blurred, or go in and out of focus, when you read?					
14	Do you move your eyes around or blink to keep text clear when you are reading?					
15	Do objects in the distance appear more blurred after you have been reading?					
16	Do you lose your place when reading?					
17	Do you re-read or skip words or lines when reading?					
18	Do you use a marker or your finger to stop you losing the place when you read?					
19	Do you cover or close one eye when reading?					
20	Do the words, page or book appear double when you are reading?					

Referral decision:

Appendix 3: FAQs in screening, referral and making recommendations.

The new SASC guidance regarding visual difficulties is clear that where symptoms of visual discomfort and/or disturbance are reported or observed during a screening and/or assessment process for a specific learning difficulty, **there is a responsibility to refer the person being assessed to a registered optometrist**, who will be qualified to assess and manage all the causes of visual discomfort and disturbance commonly encountered, and who will refer onwards to an ophthalmologist if there is any evidence of disease or abnormality.

Referral is crucial:

- To eliminate the possibility that the symptoms experienced are attributable to an underlying illness or eye disease, with potential sight or even life-threatening consequences.
- To assess whether the symptoms experienced are attributable to refractive, oculomotor and/or visual sensory stress conditions.
- To ensure that the cause of symptoms is correctly identified. Similar symptoms may have different and sometimes interrelated causes.

The guidance advises SpLD assessors **not to attempt diagnosis of visual difficulties** but to refer to a qualified, registered vision professional. This advice means **not** administering visual stress/Irlen screenings, as the possibility of visual stress should be considered in the context of other possibilities, not in isolation (3.6). Although the use of coloured overlays or glasses could be an appropriate intervention for some visual difficulties, it is important to direct the client to registered professionals who are not only qualified to assess and treat conditions affecting vision, but also qualified to recognise pathologies of the eyes and the visual system, and their effects (3.1).

Q. I have been administering colour screenings for visual stress for many years and / or have undergone training to do so. Does the new advice mean that I cannot continue to screen for coloured overlays?

Many symptoms that have been regarded as indicative of visual stress (see e.g. British Dyslexia Association http://www.bdadyslexia.org.uk/dyslexic/eyes-and-dyslexia) often have other causes. In a minority of cases they are symptoms of pathology that may be sight-threatening or even life-threatening. More often they are symptoms of refractive and/or oculomotor problems that can only be properly assessed and managed by qualified, registered professionals. While visual stress may be present in some people who report visual symptoms, it is inappropriate and some would say unethical to screen for this condition in isolation without taking account of other possibilities.

Travers (2017) argues that as a result we should take a conservative approach that **minimises the potential for harm**. The danger in administering a colour screening without a prior referral for an eye examination is that the process of selecting a colour filter may divert the client away from other possible and more likely explanations of their visual difficulties.

Q. I know from personal experience and/or my professional experience that students/clients do sometimes find that coloured filters, overlays or glasses make a difference to their reading

comfort. If I do not administer a screening for colour, isn't there a chance that students/clients will miss out on the potential benefits of the use of colour?

While many optometrists do recognise that many of their clients read faster and more comfortably using colour filters, not all vision professionals recognise the existence of visual stress, its impact on reading difficulties and its treatment using coloured filters. It is recognised that there may exist few local routes to colour testing and that there is a need for a protocol for optometrists, to ensure that assessment and management covers all aspects, not just refraction, and a) includes visual stress assessment and colorimetry, but also b) uses agreed standards for showing evidence of benefit. There are currently 'best practice' recommendations for optometrists undertaking visual stress assessment (Evans, Allen & Wilkins, 2016) and examination of patients with SpLDs (College of Optometrists, 2017; Wilkins, Allen, Monger & Gilchrist, 2016).

This guidance will be regularly updated. Assessors working in different areas of the UK could contribute to the production of a list of registered vision professionals working to these standards by forwarding to SASC details of local vision professionals known to adhere to these standards.

In advising referral to registered optometrists, the guidance does not rule out the possibility of the client **returning to the assessor** after an eye appointment, specifically to discuss and explore the use of colour to alleviate visual symptoms, especially if the optometrist does not offer colorimetry testing.

However, the caveats above remain. **For the safety of the client/student, other possible causes of visual discomfort and disturbance need to have been ruled out first.** It also needs to be recognised that other interventions and management strategies for visual discomfort and disturbance, besides the use of colour, may be more appropriate and effective.

This advisory change is likely to require some re-thinking of the typical routes through screening to assessment currently used in the majority of adult assessments in higher education and the workplace.

Q. Does this mean that there will have to be changes to the current screening and assessment models to accommodate possible referral for visual discomforts and difficulties?

The SpLD assessment model we currently have for adults is generally of a single assessment session carried out over 2-4 hours. Many universities used to have in-house assessors, who could carry out extended screenings and /or be more flexible if necessary about deferring or splitting assessment sessions but now most SpLD assessment is now outsourced to private companies or freelancers, or the student is expected to obtain an assessment report privately. Time is money...so there is usually a fixed fee for assessment and a 'result' is expected after the assessment in the form of a report identifying whether or not the student has a SpLD.

F.E and H.E institutions vary in their screening and/or referral processes. Most have links to a G.P practice and counselling/mental health services, many have links with local SpLD assessors and increasingly universities are developing links with local providers of assessments for autism and ADHD, but very few have yet set up or developed links with local opticians/optometry practices or clinics. The University of Bradford is an example of where one such link does exist and students with suspected visual difficulties at that university can be referred to The Eye Clinic

https://www.bradford.ac.uk/the-eye-clinic/. This is not a private clinic, but a clinic run by the University School of Optometry and Vision Science – most if not all the university optometry schools have such clinics. These could be used these in a number of ways: a) as service providers to whom clients can be referred by assessors in their region, b) as models for the type of service that other optometrists should offer, c) as reference points for local optometrists (and, possibly, SpLD assessors) to receive additional education and training, and d) as an ongoing research and development network to improve knowledge and practice.

Not all students presenting for assessment will report visual difficulties or require onward referral. At screening or assessment, SpLD advisers/assessors **may attempt an evaluation and subsequent description of symptoms** if reported by the student and/or as observed in the screening/assessment session. This may require some modification to an existing screening and assessment process, to the writing of the report and to any recommendations made in that report. Development of a 'screening' protocol – what questions to ask, to whom to refer, how to know when any reported visual difficulties really do seem to contraindicate a specific learning difficulty such as dyslexia, and how to judge when to proceed to a SpLD assessment without the need for prior referral to a vision specialist, is extremely important.

Q. What changes may have to be made to screenings carried out prior to referral for assessment?

All students reporting any kind of visual discomfort or disturbance should be administered the suggested screening protocol in Appendix 2. This may be used as the basis for a referral to a vision professional (see sample referral letter in Appendix 4). Written consent for the referral should be obtained from the student or client and they should be given a copy of the referral letter.

It is not currently possible or reasonable to insist that students obtain a *specialist* eye examination as these can be expensive. However, it is important to explain the reasons why the referral has been made and to give students the option to pursue that referral. Ideally each assessor or institution could work towards identifying a few specific optometrists locally with whom they could establish a working partnership. In updating this guidance, as explained above, one key aim is to establish a list of UK recommended practitioners but this will require time and the cooperation of assessors around the UK.

Not all vision professionals recognise the existence of visual stress, its impact on reading difficulties and its treatment using coloured filters, and behavioural optometry and colorimetry testing are not currently considered by all vision professionals as mainstream vision practice. It would seem best, at least, to advise students to seek out vision practitioners who use methodologies that have been described in peer-reviewed research literature (see Evans, Allen & Wilkins, 2016; Wilkins, Allen, Monger & Gilchrist, 2016).

All students reporting any kind of visual discomforts or disturbances *could* at least be required to produce the results of a recent standard eye test before proceeding to a SpLD assessment.

When arranging appointments for full SpLD diagnostic assessment, it could be made clear to the person seeking assessment that, given the importance of vision in reading, a diagnostic assessment will not go ahead if they fail to bring glasses /contact lenses they have already been prescribed to the assessment and that they will be liable for the costs of any postponed assessment.

Q. What changes to the SpLD assessment process could be considered?

The **3Rs** in assessment regarding visual difficulty are **Report, Refer and Recommend.**

If a screening questionnaire for visual difficulties has *not* been used at screening and the student reports such difficulties during the assessment, it is then important to ensure that a screening questionnaire is administered during the assessment (see Appendix 2) and the student's responses are summarised in the written report.

REPORT

In the **background information/developmental history** section of the report relevant information given by the student regarding any developmental history of visual problems, any relevant illnesses and any persisting experiences of visual discomfort/disturbance can be described. If the student has used coloured overlays, filters and glasses in the past, their experience of the effectiveness of these interventions can be noted. Have they stopped using these aids and if so why?

In **reporting test conditions,** note any requests made by the student to use muted lighting, coloured overlays, discomfort with certain artificial lights and /or flicker etc.

In describing the **results of tests administered**, note relevant behavioural responses to the tests (e.g. signs of tracking difficulties, responses to glare and distortion, the experience of words moving, merging, standing out 3D on a page, over-focus on patterns in text, words fading or darkening, use of finger to mark place in reading, rubbing of eyes, eyes watering, squinting, onset of headache etc). Assessors should ask the student how they experienced the tests of reading, writing and symbolic language processing.

In describing the **results of any screening questionnaire** administered, summarise the responses given by the person assessed.

REFER

Assessors need to consider the **possibility** of one of four possible diagnostic outcomes:

SpLD	Visual difficulties	Outcome
✓	✘	• A standalone diagnosis of SpLD. • No history or current sign of significant visual difficulties, discomforts or disturbances has been reported/observed during the assessment. The SpLD is evidenced by underlying difficulties in phonological processing, working memory, motor coordination difficulty etc. • No need for onward referral or recommendations to a vision professional. • The student may experience difficulty with some tests of processing speed, and/or read and write more slowly and less fluently than expected but the causes of these difficulties do not appear *primarily* related to the sorts of refractive, oculomotor or visual stress problems that could be investigated by a vision professional.

✓	✓	• Behavioural traits learned as consequence of managing an underlying visual difficulty (e.g. sacrificing speed over accuracy in an attempt to get a reading process over and done with) may **interact** with the effects of an underlying SpLD such as dyslexia. • If words cannot be recognised, or text cannot be understood, then visual difficulties assume greater significance. If a skilled reader experiences discomfort and disturbance, they may be able to bypass these effects. If a dyslexic or unskilled reader experiences the same symptoms then the disruption of reading ability may be greater. • The assessor will be better-informed to assess these interrelationships **if the student has had a previous eye examination that has ruled out or explained other refractive or oculomotor issues and, where possible, has considered the impact of any visual stress condition**. • Information from the vision professional's examination can be mentioned in the report and used to support conclusions reached. • Where this prior information does not exist, the assessor can only speculate about these interrelationships. It could still be possible to identify a SpLD but **not, at the assessment,** to diagnose or confirm a visual difficulty. • The student/client should be referred on for an eye test.
✗	✓	Onward referral is the only option at this point. The options described under screening above can be considered.
✗	✗	It is likely that any difficulties experienced can best be explained by a range of other factors.

RECOMMEND

In making recommendations assessors will need to be guided by the advice above and remember that visual stress has no special status in relation to (i) the range of other visual problems it is possible to experience and (ii) specific learning difficulties.
The recommendations section of the report can be used to suggest routes to referral, if these are seen as necessary.

There might also be a place, where appropriate, for suggesting interim experimentation with coloured overlays, changes to the tint of computer screens, the use of coloured or matte paper for printing texts, etc. Such low-cost experimentation with a range of techniques is unlikely to be harmful as long students are informed about the tentative nature of research into the efficacy of coloured filters.

Other strategies may also be effective, such as recommending text is widely spaced and uses a low contrast font with increased horizontal spacing between the letters, and masking lines above and below the text. Such strategies will be specific to the individual.

Frequent paragraphing and text in more than one column on a page could also be beneficial. Directing lighting on to the text but away from the eyes might help. These are ergonomic issues;

i.e. aspects of the text and environment that have a general effect for everyone but are not necessarily specific to, or worse for, people with a SpLD.

Metacognitive strategies, where students are encouraged to consider the potential effects of behavioural strategies they might have learned to employ in the reading process, could also be useful.

It is important that the person assessed is aware that research is ongoing in the understanding of the role of visual difficulties and visual factors both for the experience of visual discomforts /disturbances by the population as a whole and for people with dyslexia.

Q. What about recommendations for additional arrangements (e.g. extra time in examinations?

- If a student has a 'diagnosis' of Irlen syndrome/scotopic sensitivity or visual stress as part of a full post-16 diagnostic assessment report identifying a specific learning difficulty written **before the publication of the new guidance in June 2018** and is seeking to use coloured overlays or glasses during examinations, this should be allowed as it is unlikely to provide any kind of unfair advantage.
- SpLD reports written after the publication of the new guidance should not 'diagnose' these conditions but they could describe symptoms and include a recommendation for referral to a vision professional. However, since the use of coloured overlays etc cannot confer advantage, there does not seem to be any reason to refuse their use in examinations to any student who requests them.
- If the student presents no evidence of a specific learning difficulty and the only evidence presented is a diagnosis of Irlen syndrome/scotopic sensitivity or visual stress, students who want to use overlays in exams should be able to do so, just as students who have prescription glasses must be allowed to use them. However, **such use of overlays should not be seen as an adjustment for a disability**, and students should not be given extra time in exams on the basis of this need.
- Where further examination arrangements are requested, such as extra time or the use of a computer, the student should be required to provide further evidence for these arrangements from a qualified vision specialist. The student could also be referred for or asked to produce a full diagnostic assessment for a SpLD.

Appendix 4: Sample referral letter – indicators of visual discomfort/disturbance

To Whom It May Concern

Re: Name DOB

Either:

I have recently been working with XX at YY, supporting him/her as a learner with specific learning difficulties (e.g. dyslexia, dyspraxia etc).

Or:

XX has recently approached YY University/College support services/ZZ assessment services…

I am writing to you…
(*delete and /or modify as appropriate*)

- Because of concerns about persistent indicators of visual discomfort/disturbance he/she has experienced over a long period of time/recently.
- Because, during an assessment for specific learning difficulties (e.g. dyslexia/dyspraxia), he/she had been previously identified with (possible indicators of) so-called Meares-Irlen syndrome/visual stress.
- Because, during an assessment for specific learning difficulties, he/she demonstrated exceptionally slow reading speeds/had exceptional difficulty tracking along lines of text when reading/demonstrated high levels of sensitivity to artificial light and 'flicker'/described how words and lines of text often appear to 'move,' merge, fade from dark to light/stand out in 3D from the page/other reported symptoms.
- Because, during a screening /an assessment for specific learning difficulties, a medical history was taken from the student that could be connected with the difficulties he/she reported in visual discomfort/disturbance.

XX appears to experience a number of substantial visual issues that are causing significant problems in his/her life and studies. These include… (describe in more detail or, **with the written permission of the student/client**, attach the screening protocol /questionnaire).

Consequently, I am writing to support a request that XX be referred to a specialist optometrist to investigate whether or not the vision problems experienced appear to be associated with performance on reading-related tasks and /or measures of ability and processing. A full optometric assessment would assist us at YY or ZZ to respond to XX's needs more effectively.

Yours etc

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Acronyms

- ADSHE – Association of Dyslexia Specialists in Higher Education http://adshe.org.uk/
- SASC – SpLD Assessment Standards Committee http://www.sasc.org.uk/
- STEC – SpLD Test Evaluation Committee (sub-committee of SASC)
- PATOSS – The Professional Association of Teachers of Students with Specific Learning Difficulties https://www.patoss-dyslexia.org/
- IOO – Institute of Optometry http://www.ioo.org.uk/dsa-briefing.pdf