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Beyond Reading: Towards a Person-Centred Conceptualisation of Visual Stress Through Lived Experience and Contemporary Evidence

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ABSTRACT

Visual stress, also referred to as Irlen Syndrome and Scotopic Sensitivity Syndrome, remains a contested concept within neuroscience, education and clinical practice. Although research has traditionally focused on reading performance, pattern-related visual discomfort and the efficacy of coloured overlays or precision-tinted lenses, comparatively little attention has been given to how individuals experience visual processing difficulties in everyday life. This paper critically examines contemporary evidence alongside original mixed-methods research exploring the lived experiences of people reporting visual stress. It argues that existing conceptualisations have become centred on reading and do not adequately reflect the breadth of reported perceptual, educational and psychosocial experiences. Rather than advocating for a particular explanatory model, the paper proposes a person-centred conceptualisation that integrates qualitative evidence with experimental and educational research. Findings from the original study demonstrate that participants consistently described environmental distortions, visual fatigue, sensory overload, anxiety, reduced confidence and barriers to recognition alongside reading difficulties. These findings do not establish causality or validate a contested diagnostic construct. Instead, they demonstrate that lived experience provides an important source of evidence for informing future research priorities, educational practice and support pathways. Broadening the conceptualisation of visual stress beyond reading may facilitate more meaningful research questions and improve understanding of the diverse experiences reported by those affected.

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Introduction

Visual stress has been the subject of considerable debate for more than four decades. Initially described by Meares and later expanded on by Irlen, it has generally been characterised by visual discomfort, light sensitivity, perceptual distortions and difficulty viewing high-contrast text or repetitive patterns [1,2]. Despite an extensive body of research, there remains no universally accepted definition, diagnostic framework or explanatory mechanism [3].

Consequently, unalignment persists regarding terminology, identification and intervention. Much of the literature has centred around understanding whether coloured overlays or precision-tinted lenses improve reading performance or reduce visual discomfort [4,5]. These investigations have significantly advanced understanding of pattern-related visual discomfort and have encouraged increasingly rigorous experimental methodologies. However, the emphasis on intervention studies has also shaped how visual stress has been conceptualised, with reading becoming the dominant context through which the condition is investigated.

This focus is understandable given the educational implications of reading difficulties. Nevertheless, it risks overlooking broader aspects of lived experience that extend beyond literacy. Early descriptions by both Meares and Irlen acknowledged perceptual disturbances affecting everyday environments, yet comparatively few studies have explored these experiences systematically through qualitative enquiry [1,2].

Across healthcare and education, there has been increasing recognition that lived experience represents an important component of evidence. Person-centred approaches emphasise understanding how individuals experience conditions in daily life, recognising that subjective accounts complement rather than replace experimental evidence [6]. Such approaches have become well established in research relating to chronic illnesses, neurological conditions and disabilities, where qualitative evidence has informed service development, educational practice and research priorities.

Visual stress, however, has not experienced the same shift. Although research investigating cortical processing, pattern glare and intervention efficacy continues to develop, relatively little focus has been devoted to understanding how people conceptualise their own visual experiences or how these influence education, employment and social participation.

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This paper argues that current conceptualisations may be more focussed on reading challenges and may not consider the impact of visual stress on all aspects of daily life. Drawing upon original mixed-methods research alongside contemporary literature, it proposes that visual stress should be understood through a broader person-centric framework that recognises the diversity of reported experiences without assuming a specific biological mechanism or diagnostic status.

Historical Perspectives

The origins of contemporary understanding of visual stress can be traced to the independent work of Olive Meares and Helen Irlen. Meares described individuals who experienced blurring, movement and instability when reading printed text, suggesting that these difficulties could not be explained solely by refractive error. Irlen subsequently reported similar observations, proposing that individually selected coloured filters reduced visual distortions in susceptible individuals [1,2].

These early accounts challenged the assumption that reading difficulties originated from language and educational factors. Instead, they suggested that some individuals experienced perceptual difficulties that influenced reading performance. Importantly, both authors also described symptoms extending beyond text, including discomfort in visually complex environments and sensitivity to lighting conditions.

During the following decades, research increasingly sought objective explanations for these observations. Wilkins' investigations into pattern glare demonstrated that repetitive striped patterns could induce visual discomfort, illusions of movement and perceptual distortions in susceptible observers [4]. These findings provided an experimental paradigm through which subjective reports could be investigated objectively and stimulated further research into cortical responses to patterned visual stimuli.

Other investigators proposed alternative explanations, including cortical hyperexcitability, magnocellular dysfunction, accommodative anomalies and binocular vision disorders. While each hypothesis accounted for particular observations, none has achieved universal acceptance. Evans and Allen concluded that evidence supporting interventions remained mixed, with methodological differences contributing to inconsistent findings across studies [3].

Consequently, contemporary literature has developed along two main areas: one focussed on identifying underlying perceptual mechanisms and the other on interventions. Comparatively less attention has been devoted to understanding whether these approaches adequately capture the lived experiences of those reporting visual stress.

Contemporary Evidence

Research investigating visual stress has largely centred on three interconnected themes: pattern-related visual discomfort, visual processing and intervention effectiveness.

Wilkins proposed that repetitive, high-contrast patterns could provoke discomfort and perceptual distortions through increased demands on visual processing. Pattern glare subsequently became one of the most widely used experimental paradigms within the field because it demonstrated that visual discomfort was not confined to reading but could occur in response to particular visual stimuli [4].

Subsequent studies have explored the effectiveness of coloured overlays and precision tinted lenses. Some investigations report improvements in reading fluency, sustained visual attention and visual comfort following individually selected colour interventions [5,6]. Other studies have questioned these findings, citing methodological limitations, placebo effects and inconsistent replication [7].

Rather than representing contradictory evidence, these differing conclusions reflect the complexity of the field. Harkin, Little and McCullough recently highlighted the continuing need for robust randomised controlled trials evaluating precision tinted lenses [8]. Their study protocol acknowledges both the widespread reporting of visual stress symptoms and the limited availability of high-quality intervention evidence. Importantly, the authors distinguish between investigating treatment effectiveness and establishing the underlying nature of the condition itself, emphasising the need for methodological rigour.

While the literature therefore demonstrates increasing sophistication in experimental design, outcome measures continue to focus predominantly on reading performance, symptom reduction and visual comfort. Although these remain important considerations, they provide only a partial understanding of the way in which visual processing difficulties affect everyday life. Increasing recognition has also been given to the overlap between visual stress and other neurodevelopmental or neurological conditions, including dyslexia, migraine and autism spectrum condition [3]. However, these associations remain complex and should not be interpreted as evidence of causation. Rather, they reinforce the importance of comprehensive assessment when individuals report persistent visual difficulties.

Overall, contemporary evidence demonstrates that perceptual difficulties associated with patterned stimuli are widely reported, but debate continues regarding terminology, underlying mechanisms and intervention efficacy. This uncertainty makes qualitative evidence particularly valuable, not because it resolves scientific debates, but because it identifies the experiences that future research should seek to explain.

Lived Experience Beyond Reading

The original mixed-methods research underpinning this paper sought to address this gap by examining how people describe visual processing difficulties in their everyday lives. Combining semi-structured interviews with an online survey of 211 respondents, the study explored reported symptoms, educational experiences and access to support.

A consistent finding across both phases of the research was that reading represented only one component of a much broader experience. Participants described environmental distortions, visual fatigue, headaches, migraines, sensory overload, altered depth perception and significant discomfort within visually busy environments. These experiences frequently affected education, employment and daily activities rather than reading alone. These findings support earlier observations by Meares and Irlen, both of whom suggested that perceptual disturbances extended beyond printed text [1,2].

Educational experiences emerged as a particularly prominent theme. Many participants described prolonged periods during which reading difficulties and visual discomfort were attributed to poor concentration, limited ability or behavioural issues rather than being explored as possible visual processing difficulties. Delayed recognition contributed to frustration, diminished confidence and reduced educational engagement.

Participants also described inconsistencies in awareness among professionals and uncertainty regarding referral pathways and available support. Financial barriers associated with privately funded assessments and interventions were frequently identified, alongside geographical variation in access to services.

Additionally, participants consistently described the importance of having their experiences acknowledged. Interviewees reported that being listened to and having opportunities to describe their visual experiences contributed to greater understanding and reduced feelings of self-blame, irrespective of any subsequent intervention. These findings are consistent with broader person-centred approaches within healthcare and education, which recognise that understanding lived experience is fundamental to developing responsive services [9].

The qualitative findings therefore suggest that existing conceptualisations of visual stress may not fully reflect the breadth of reported experiences. Rather than viewing visual stress solely through the lens of reading performance, future research should consider how visual processing difficulties influence participation across multiple aspects of everyday life.

Discussion

The evidence considered within this review suggests that visual stress has predominantly been conceptualised through a functional model of reading performance. This emphasis has generated important advances in understanding pattern-related visual discomfort and has encouraged increasingly rigorous investigations into intervention efficacy. However, the findings of the present study indicate that such a perspective captures only part of the lived experience reported by individuals who describe visual processing difficulties.

Reading undoubtedly represents one of the most visible and measurable consequences of visual stress, particularly within educational settings. Consequently, many studies have used reading speed, reading accuracy and visual comfort as primary outcome measures. While these measures remain valuable, they

may inadvertently constrain understanding by framing visual stress primarily as a literacy-related phenomenon [3,4].

The present findings suggest a broader conceptualisation is warranted. Participants consistently described visual experiences extending beyond reading to include environmental distortions, discomfort in visually busy environments, visual fatigue, headaches, migraines, sensory overload and reduced confidence. These experiences frequently influenced education, employment and everyday activities, highlighting that the reported impact of visual processing difficulties cannot be understood solely through reading performance. This broader perspective is supported by earlier descriptions within the literature. Meares and Irlen both recognised that perceptual disturbances extended beyond printed text, while Wilkins demonstrated experimentally that repetitive visual patterns can provoke discomfort across a range of visual environments [1-4]. More recently, Harkin, Little and McCullough have highlighted the continuing need for high-quality evidence investigating interventions while acknowledging the complexity of the condition itself. Collectively, these studies suggest that visual stress should not be viewed exclusively as a reading difficulty but as a broader experience of visual discomfort associated with particular visual environments [8].

Importantly, broadening the conceptualisation does not imply acceptance of visual stress as a medically recognised diagnosis, nor does it validate any particular theoretical explanation. The present study does not seek to determine causality or evaluate competing neurophysiological hypotheses. Instead, it demonstrates that the experiences reported by participants are more diverse than those commonly reflected within the literature.

One of the most significant findings relates to recognition and understanding. Participants frequently described prolonged periods during which their visual experiences were misunderstood or attributed to poor motivation, behavioural difficulties or low academic ability. These accounts mirror wider educational research demonstrating that delayed recognition of additional learning needs may have lasting consequences for confidence, participation and educational attainment.

Participants also described considerable variation in professional knowledge and awareness. Many reported uncertainties regarding where to seek advice, inconsistent information from different professionals and limited access to services. These findings do not necessarily reflect disagreement regarding intervention effectiveness. Rather, they highlight the practical consequences of uncertainty within the field itself.

Another important contribution of this study concerns methodology. Much of the existing evidence base has appropriately prioritised quantitative research capable of evaluating visual performance and intervention outcomes. However, qualitative enquiry provides different forms of evidence by identifying experiences that are difficult to quantify yet remain central to everyday functioning. Lansdowne's qualitative work similarly demonstrates that lived experience can enrich understanding of visual stress by exploring how individuals interpret their visual

experiences and the consequences these have for education, work and daily life. Such evidence should not be viewed as competing with experimental research but as complementing it by identifying questions that merit further investigation. The integration of qualitative and quantitative evidence therefore offers a more comprehensive framework for future research. Experimental studies remain essential for evaluating interventions and investigating perceptual mechanisms. Equally, qualitative research ensures that these investigations remain grounded in the experiences and priorities of those reporting visual processing difficulties. Together, these approaches provide a more balanced understanding than either could achieve independently [10].

Implications for Research and Practice

This review identifies several priorities for future research. First, there is an opportunity to leverage mixed-methods research that combines objective measures with qualitative exploration of lived experience. Such approaches enable researchers to investigate not only whether interventions produce measurable changes but also whether these changes are meaningful within everyday life.

Secondly, future studies should adopt broader outcome measures. Reading performance remains an important educational indicator and it should be considered alongside visual fatigue, light sensitivity, environmental comfort, participation, confidence, educational engagement and quality of life. These outcomes more closely reflect the experiences consistently described by participants in the present study.

Thirdly, greater awareness is required within education and professional practice. This recommendation should not be interpreted as advocating routine identification of visual stress or any specific intervention. Rather, professionals should be aware that some individuals report persistent visual processing difficulties that may warrant further assessment and appropriate referral within existing evidence-based pathways. Finally, future conceptual work should distinguish between the reported experiences of individuals and the scientific explanations proposed to account for them. Maintaining this distinction is essential if research is to remain balanced while acknowledging the legitimacy of lived experience as an important source of evidence [11-17].

Conclusion

Visual stress continues to generate considerable debate regarding its definition, underlying mechanisms and management. Nevertheless, the evidence reviewed in this paper demonstrates that many individuals consistently report visual processing difficulties that extend beyond reading and influence multiple aspects of everyday life. The original research presented here suggests that current conceptualisations may underestimate the breadth of these reported experiences. Participants described environmental distortions, visual fatigue, sensory overload, headaches, reduced confidence and barriers to recognition alongside more familiar reading-related difficulties. These findings support the argument that future research should move beyond a predominantly reading-centred framework towards a broader

person-centred understanding of visual processing difficulties.

Such an approach neither confirms nor rejects visual stress as a distinct clinical entity. Instead, it recognises that understanding lived experience represents an essential complement to experimental and educational research. Integrating these perspectives offers the potential to improve future research design, inform educational practice and ensure that the questions investigated by researchers more closely reflect the realities experienced by those reporting visual stress.

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