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Unravelling the Complexities of Myopia: Nature vs. Nurture

The longstanding nature vs. nurture debate continues to shape developmental discussions among healthcare professionals, researchers, and educators alike. Myopia, a common refractive error, has been a subject of particular interest in this context. While the hereditary nature of myopia seems apparent due to its familial association, could environmental factors actually play a more significant role? Close work and extended screen time have been identified as potential triggers for myopia, making it vital to consider both genetic and environmental influences in its development.

Researchers often turn to twin studies to explore potential links between myopia and genetics. However, even in twin cases where both siblings have myopia, the book/computer argument resurfaces. Conversely, if only one twin is affected, factors like outdoor activities may come into play. Hence, discerning the true cause of myopia requires rigorous selection and management of population data, revealing a complex condition influenced by a combination of genetic and environmental factors.

Recent studies recognise the significant impact of parental myopia on a child's risk of developing myopia [[1](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4473431/)]. Genetic research made significant strides in 1981 with the identification of the MYP1 genetic locus, which intriguingly affected only the male line [[2](https://www.sciencedirect.com/science/article/pii/S0014483519303136)]. Subsequent studies have identified numerous genetic loci linked to refractive errors, including those leading to myopia. Yet, scientists believe that this is merely the beginning, and further investigation is necessary to fully map the effects of genetic instructions within the eye.

The complexity of myopia arises from the intricate structure of the eye, where different genes can influence the likelihood of myopia in distinct ways. Abnormal eye growth is a common aspect of myopia, with certain gene variants triggering elongated eye lengths, thereby causing refractive errors. Additionally, eye development is influenced by the amount of light received, making spending time outdoors a crucial management tool for myopia.

Research suggests that eye colour may impact light management within the eye, which is directly linked to eye growth. Studies indicate that darker iris colours may be associated with more myopic refractive errors, while children with colour vision deficiencies surprisingly exhibit a lower incidence of myopia [[3](https://onlinelibrary.wiley.com/doi/10.1111/opo.12427)].

Studies reveal that genes account for up to 80% of the variance in refractive error, underscoring the dominant role of genetic predisposition in myopia development [[4](https://link.springer.com/chapter/10.1007/978-981-13-8491-2_5)]. However, environmental factors should not be overlooked, as understanding the interplay between genetic risk and the environment is vital in anticipating and mitigating controllable risk factors.

Understanding the intricate relationship between myopia and genetics is a paramount endeavour. While genetics undoubtedly plays a significant role, environmental influences cannot be disregarded. With increased awareness of genetic predisposition and its interaction with environmental factors, we can better detect and manage myopia early, potentially slowing its progression in our children. As research continues to shed light on this complex condition, a comprehensive approach encompassing both genetic and environmental aspects is essential for effective myopia management.

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Independent information on myopia and myopia management can be found on [myopiafocus.org](https://www.myopiafocus.org/what-is-childhood-myopia).

Please also consider signing this [change.org petition](https://chng.it/Ft25M75fpD) to get the NHS to recognise myopia as an ocular disease and improve funding for myopia management for children.

**Images:**

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A person and a child smiling

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