

## Vision: Myopia and ambient night-time lighting

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S1

**Myopia is a common affliction (one in four adult Americans is near-sighted<sup>1</sup>), and juvenile-onset myopia is believed to be due to a combination of genetic and environmental factors<sup>2</sup>. Results from animal experiments indicate that light cycles may affect the development of myopia<sup>3,4</sup>, and Quinn *et al.* claim to have extended these to humans<sup>5</sup>. They reported a strong association between childhood myopia and night-time lighting before the age of two: there were five times more children with myopia among those who slept with room lights on than in those who slept in the dark, and an intermediate number among those sleeping with a dim night-light<sup>5</sup>. However, we have been unable to find a link between night-time nursery lighting and the development of myopia in a sample of schoolchildren.**

S2

We examined the issue of nursery lighting in a subsample of children from the multicentre Collaborative Longitudinal Evaluation of Ethnicity and Refractive Error (CLEERE) Study. Parents reported their use of night-time lighting and their own refractive status, and the child's refractive error was measured by cycloplegic autorefraction. Our sample consisted of 1,220 children with a median age of 10.2 years: 11.5% of them were African-American, 19.1% Asian, 47.9% Caucasian and 21.6% Hispanic; overall, 18.1% of them were myopic (at least -0.50 dioptres spherical equivalent). The proportion of children with myopia did not differ across nursery-lighting groups ( $\chi^2 = 2.62$ ,  $P = 0.271$ ). Eighty-four of 417 children (20.0%) who slept in darkness were myopic; 128 of 758 children (16.8%) who slept with a night light before age two were myopic, and 10 of 45 children (22.2%) who slept with full room lights on before age two were myopic.

S3

We found an association between the number of myopic parents and nursery lighting before age two ( $\chi^2 = 35.02$ ,  $P < 0.001$ ), as well as an association between ethnicity and room lighting ( $\chi^2 = 89.22$ ,  $P < 0.001$ ). This sample carries a statistical power of 0.99 to be able to detect an odds ratio of 2.00 between nursery lighting and childhood myopia.

S4

Our results do not replicate those of Quinn *et al.*<sup>5</sup>. In fact, the proportion of myopic children in those subjected to a range of nursery-lighting conditions is remarkably uniform. The association we find between parental myopia and nursery night-time lighting suggests that Quinn *et al.*'s study should have controlled for parental myopia.

S5

Another possible difference is that Quinn *et al.*'s sample is not representative of juvenile myopes. It was drawn from a tertiary referral, paediatric ophthalmology outpatient clinic, and the sample had a median age of eight (young for a sample of myopes) with a very high proportion of myopia (30%). Our sample had fewer myopes and fewer hyperopes, and the children were older. Also, the proportion of parents reporting that their infants slept under full lighting is different in our study: more than 15% of their clinic-based sample had full nursery lighting, whereas only 3.7% of our representative, school-based sample had full room lighting at night.

S6

Our results indicate that myopia is unlikely to develop in children as a result of exposure to night-time lighting as infants.

See also J. Gwiazda *et al.*

Reply: R. Stone *et al.*

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