Letter to the Editor - Near work light levels and dioptric profile – Which factor dominates and influences the short-term changes in axial length?

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Declaration

The authors declare no competing interests.

To the Editor,

We read with great interest a recent publication in your journal titled "Near work light levels and dioptric profile – Which factor dominates and influences the short-term changes in axial length?" by Maldoddi et al.[1] In the article, the authors compared changes in axial length of adults after 15-minute viewing in several conditions – 1) distance outdoor vs. distance indoor; 2) reading outdoor vs. reading indoor; 3) reading indoor cluttered vs. reading indoor uncluttered. We are particularly interested in Experiment 2 because of the similar work done before which was also cited.[2] In the article, we noticed several points which may require additional attention.

1) Comparison between light levels and dioptric profile was expected while reading from the title. It was a pity that the authors separated into 2 experiments because the factors altogether within the same sample would be interesting to compare.

2) In Experiment 1 distance task, subjects were required to look at an outdoor natural scene

and an indoor plain wall to compare the effect light intensity on ocular biometry. It is worth noting that besides light intensity, the difference in spatial frequency content between outdoors and indoors has been proposed as a risk factor for myopia.[3, 4]

3) The authors adopted a 20 cm viewing distance for the reading tasks, which was considerably short, despite the subjects were required to read-a-loud to maintain the text clarity. The authors, together with another study by the same group,[5] referenced to a previous study investigating font size and reading distance when using mobile phone.[6] It was reported that the viewing distance was 36.2 ± 7.1 cm for text messages and 32.2 ± 7.4 cm for internet browsing, in whom 22.5% of the viewers adopted a distance <30cm. Therefore, 20 cm appears to exert high accommodative demand on adults, and we speculate that the subjects, with individual lag of accommodation, may have experienced different amount of hyperopic defocus and hence possibly other ocular biometrics.

4) In the cluttered environment, the authors pointed out that the cluttering was at a relative peripheral visual field owing to the size of reading material and short reading distance. In contrast, the region of interest in our previous study was the central visual field of 30° radius,[2] where the cluttering in the current study setting may be out-of-range. Increasing the viewing distance and/or using a smaller reading material could be viable alternatives to expose more visual field to the cluttering.

5) Comparison between cluttered and uncluttered environments may not be directly implicated to that of uniform and diversified dioptric profiles. For instance, in the uncluttered environment, the slant tabletop with respect to the line of sight could still create non-uniform dioptric profile. Therefore, pixel-wise quantification may be a better representation of the environment than individual object distance from the eye, which we speculate the dioptric profile within the central 30° visual field may look fairly similar in cluttered and uncluttered conditions, and the effect dioptric profile may not be thoroughly investigated in the study.

Finally, despite the comments on the short-term experimentation setup, we agree with the authors that longer experimentation could provide further insight on effects of light intensity and dioptric profile, which may provide further evidence for practitioners to discuss with patients in clinical practice.

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