

## Introduction

Various factors especially different components of accommodation have been used to assess visual fatigue. Studies<sup>1,2</sup> have demonstrated positive correlation between accommodative lag and visual fatigue. Also, it is shown that accommodative microfluctuations, particularly the low frequency component increases with visual fatigue<sup>3,4,5</sup>.

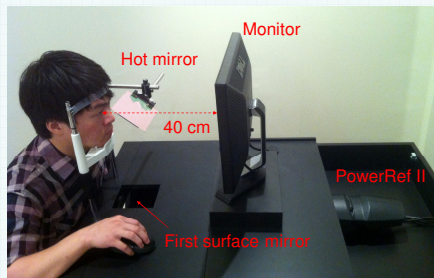
Therefore, this study aims to identify the most reliable indicator for visual fatigue among accommodative lag and accommodative microfluctuations, when measured simultaneously.

## Materials and Methods

### Sample

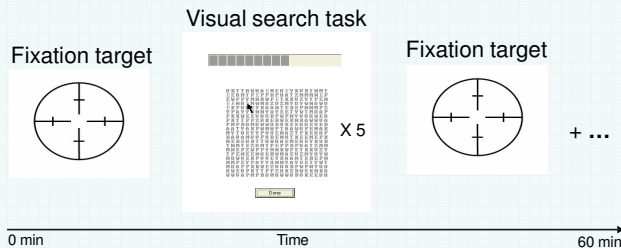
12 emmetropes ( $\leq 0.75$  DS,  $< 0.75$  DC astigmatism) and 2 myopes ( $-2.00$  DS &  $-4.00$  DS; corrected by soft contact lenses); age range 23-39 years (non-presbyopes)

### Apparatus



### Procedure

- Subjects performed 60 minutes of task displayed on the monitor
- During task performance, a fixation target for 20 seconds was displayed after every 5 presentations of the visual search task

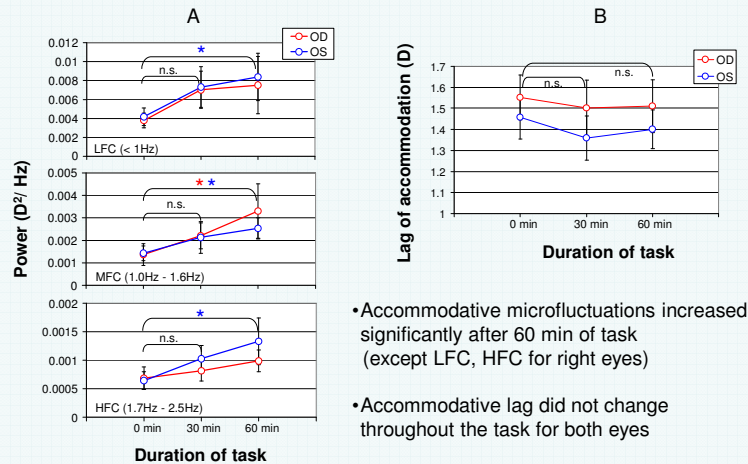


- For visual search task, each subject was asked to find the letter E and click on it with the mouse
- Real-time recording of refraction was done throughout the task using PowerRef II (Plusoptix GmbH, Nürnberg, Germany) @ 25 Hz
- Subjective measurement of visual fatigue was done before and after the task; using a questionnaire consisting of 8 questions on a five-point scale

## Data Analysis & Results

Power spectrum of accommodative microfluctuations for fixation targets at 0 min, 30 min and 60 min was analyzed by Fast Fourier Transformation using MATLAB®

### Accommodative Microfluctuations Vs Accommodative lag

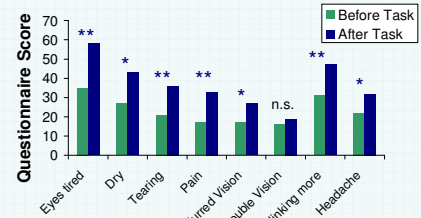


- Accommodative microfluctuations increased significantly after 60 min of task (except LFC, HFC for right eyes)
- Accommodative lag did not change throughout the task for both eyes

(A) mean power (B) mean lag of accommodation plotted against duration of task. Error bars represent  $\pm 1$  SE. LFC – low frequency component, MFC – middle frequency component, HFC – high frequency component. \* p<0.05; n.s. – not significant

### Subjective measurement

A substantial increase in sensation of visual fatigue was reported by subjects after the task



Total questionnaire score of all subjects plotted against each question  
\*\* p< 0.01; \* p<0.05; n.s. – not significant

## Conclusion

- Visual search task successfully induced visual fatigue
- No change in accommodative lag but significant increase in accommodative microfluctuations after 60 minutes of performing task
- Accommodative microfluctuations appear more sensitive to visual fatigue than accommodative lag and therefore, a reliable indicator

## References

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