

# Evaluation of three distinct parameters for visual fatigue assessment

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## Introduction

Various studies have measured accommodative microfluctuations (AMF)<sup>1,2</sup> and Critical Flicker Fusion Frequency (CFFF)<sup>3,4</sup> for visual fatigue assessment. Also, several products are available these days claiming relief from eyestrain mostly either by relaxing accommodation or enhancing contrast. Apart from AMF, either CFFF or contrast measurements are not well established for visual fatigue assessment.

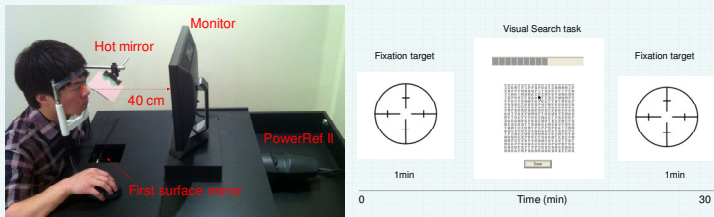
Therefore, this study aims to measure three distinct parameters: AMF, Contrast Sensitivity (CS) and CFFF in one study; to compare their efficacy for the assessment of visual fatigue.

## Materials and Methods

### Sample

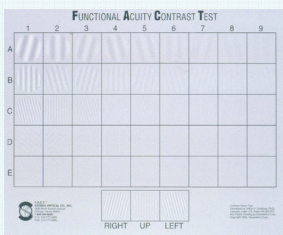
30 emmetropes ( $\leq 0.75$  DS,  $< 0.75$  DC astigmatism); age range 19-42 years (non-presbyopes & non-symptomatic)

### Apparatus & Procedure



### Set-up for accommodative microfluctuations measurement

- Subjects performed 30 minutes of visual search task displayed on the monitor
- Real-time recording of refraction was done throughout the task using PowerRef II (Plusoptix GmbH, Nürnberg, Germany) @ 25 Hz and AMF was analyzed for the two fixation targets before & after task.



Functional Acuity Contrast Test (FACT™)



Visual fatigue detector measuring CFFF

- CS, CFFF (3 measurements each time) & Subjective measurement using a questionnaire were done before & after the task.

## Acknowledgements

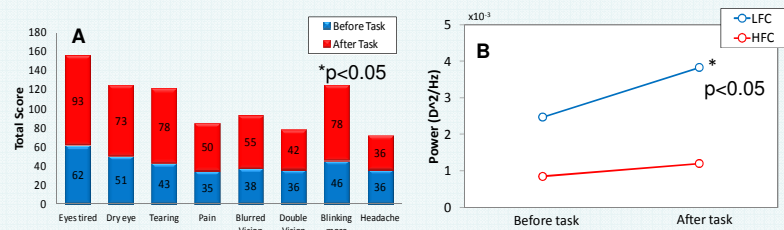
Bjorn Dröbe, Konogan Baranton, Yuan Quan, Neenu Rose Lawrence

## References

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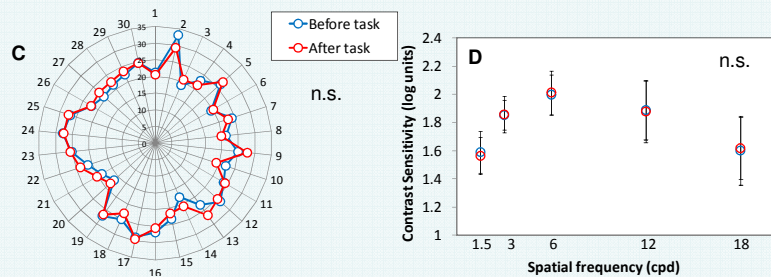
## Results



(A) Total questionnaire score of all subjects plotted against each question

(B) Mean accommodative microfluctuations plotted against time; \*  $p < 0.05$  - significant

LFC & subjective measurement increased significantly after task



(C) CFFF for each subject before & after task (D) Mean CS plotted against spatial frequencies. Error bars represent mean  $\pm$  SD; n.s. – not significant

CFFF & CS for any spatial frequency did not change after task

## Conclusion

- Out of 3 parameters measured, only AMF increased significantly in coherence with subjective measurement with induced visual fatigue in non-symptomatic people
- Indicates that symptomatic visual fatigue people should have exhausted & fragile accommodative system that needs to be taken care of in the management of visual fatigue.