Effect of experimental conditions in the accommodation response in myopia

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Presentation Number: 761

Purpose:

To analyze the effect of stimulation method, stimulus depth and field of view (FOV) on the accommodation response for emmetropes (EMM), late-onset myopes (LOM) and early-onset myopes (EOM).

MATERIAL & METHODS

Monocular accommodative response were measured in random order under 60 different viewing conditions, result of permuting the following factors:

- Stimulation procedure: Free Space or Badal lens viewing
- Stimulus depth: Flat or Volumetric
- Field of View (FOV): 2.5º, 4º, 8º, 10º, 30º
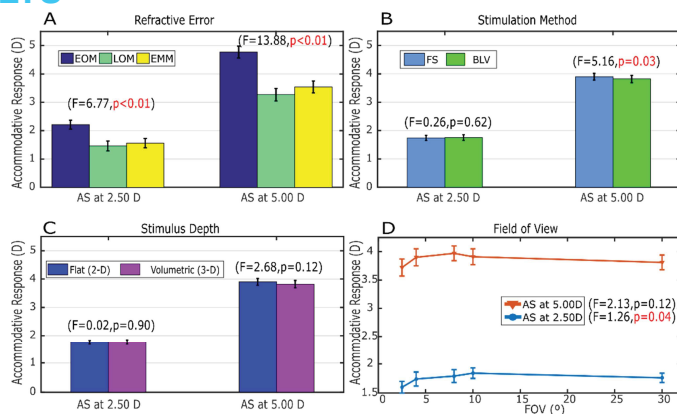- Accommodation stimulus demand: 0.17 D, 2.50 D, 5.00 D.

The refractive error groups (mean age 24 yo) comprised n=9 EMM, n=8 LOM and n=9 EOM.

Schematic representation of the setup and participants' point of view
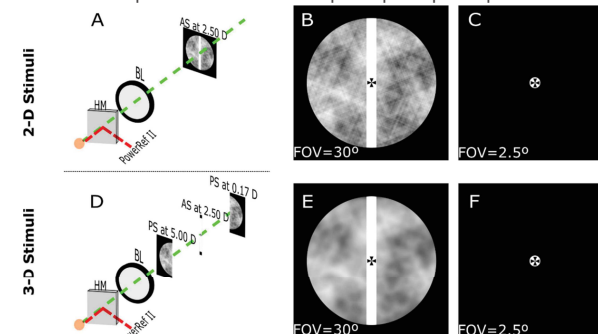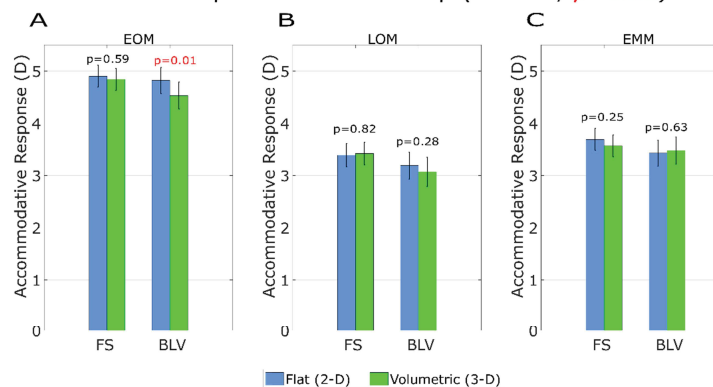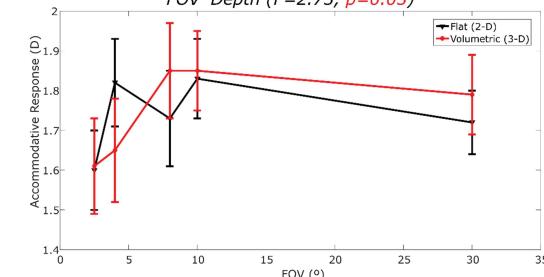
RESULTS

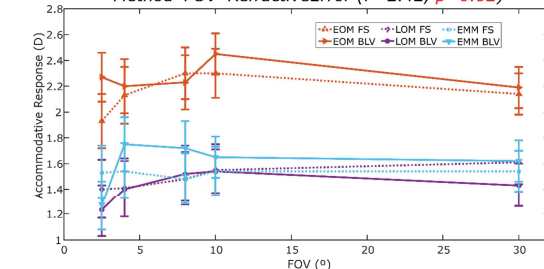Main effects for 2.50 D and 5.00 D stimuli

Interaction term for 5.00 D stimulus: *Method*Depth*RefractiveGroup (F=4.08, p=0.03)*

Interaction term for 2.50 D stimulus: *FOV*Depth (F=2.73, p=0.03)*

Interaction term for 2.50 D stimulus: *Method*FOV*RefractiveError (F=2.42, p=0.02)*

- Mixed ANOVA for **2.50 D** → significant interactions: *FOV*stimulus depth* and *stimulation method*FOV*refractive error*.
- Mixed ANOVA for **5.00 D** → significant interactions: *stimulation method*stimulus depth*refractive error*.

CONCLUSIONS

The most accurate accommodative response were obtained for FOV between 8º and 10º, which suggests that there may be an optimum peripheral retinal image size for accommodation stimulation. Differences in accommodative response when using lens-based methods compared to Free Space viewing may be explained by the effect of other factors such as the FOV or the depth of the stimulus.