ORAL PRESENTATION

ROOM: MR 06

VISION AND NEW TECHNOLOGIES

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RESEARCH-LED THEME

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Cover test might overestimate the phoria values

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Key words: Cover test, phoria, eye movements

PURPOSE:

To analyse the differences between deviations of both eyes and the displacement of one single eye during the assessment of horizontal phoria in the cover test.

METHODS:

Both eyes' movements were registered synchronously with the eye-tracker embedded in the stereoscopic virtual reality system EVA (Eye and Vision Analyzer, Davalor Salud, Spain) during the performance of the cover test at 40 cm. Participants fixated a stimulus during 2 consecutive cycles consisting in binocular vision, right eye occlusion, binocular vision and left eye occlusion. Each state lasted 4 s (seconds) but only the last 0.5 s was considered to compute the median eye's position of each state. Two computational methods were used to quantify the phoria. First, it was calculated as the occluded eye's displacement from the previous binocular state. Second, phoria was computed as the difference between both eyes' displacements from their respective binocular positions.

RESULTS:

31 subjects participated in the study: mean age ± standard deviation (SD) of 22.6±5.5 years, normal or corrected-to-normal visual acuity and horizontal phoria greater than 1 PD (prism dioptre) (14 exophoric and 17 esophoric). The mean eye-tracker's accuracy ± SD was 0.36°±0.16°. The dependent t-test showed statistically significant differences between the phoria values computed as one eye's displacement and between eyes deviations (t(30)=8.1, p<0.001). The mean difference ± SD was 0.64±0.44 PD (range from 0.12 PD to 1.68 PD). In 19.4% of the subjects the differences were greater than 1 PD.

CONCLUSIONS:

Important advantages of using an eye-tracker during the cover test are the higher resolution of the measurement comparing with clinician's observations and the possibility of registering both eyes' movements synchronously. Our results suggest that the phoria measurement considering one eye's deviation is greater than when the deviation of both eyes is taken into account. It is hypothesized that
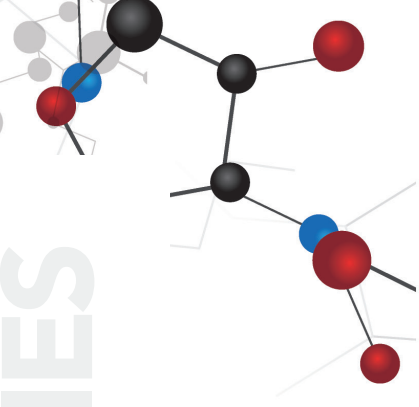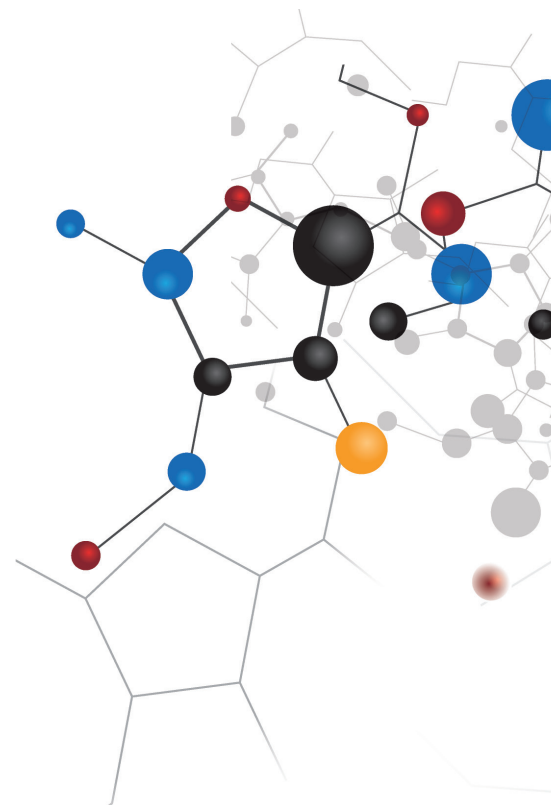
under dissociated conditions the fixating eye moves according to Hering's law of equal innervation, which leads to an overestimation of the phoria value when deviations of only one eye are considered.

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