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FOVEAL L AND M CONE RATIO AND TOPOGRAPHY ESTIMATED WITH CHROMATIC HYPERACUITY STIMULI P. D. Gowdy, C. M. Cicerone, and S. Otake University of California, Irvine, CA.

Purposes. The high foveal cone density and the optical characteristics of the human eye are barriers to psychophysical measurements of the separate topographies of L- and M-cones in fovea centralis. The aims of this study, for central fovea, were (1) to devise a method allowing the estimation of the topographies of L- and M-cones, and (2) to provide a novel method for estimating the relative numbers of L- and M-cones. **Methods**. Monochromatic (620, 560, and 520nm) vernier dot stimuli (1' of arc squares with 3' of arc separation, 200ms duration) were presented with target (top) displacements ranging from 0" to 70" of arc to the left and right of the reference (lower) upon selective, cone-suppressing background fields. The task was to indicate whether the target was displaced to the left or right of the reference dot in each self-presented trial. The data generated from computer simulations, taking into account optical scatter, eye movements, and different configurations of L- and M-cone mosaics, were matched to the experimental data to estimate the L- and M-cone ratio and their topographies for each observer. **Results**. Obtained L- and M-cone ratios were in close agreement with previous estimates based on a small-spot detection task (Cicerone and Nerger, 1989; Otake and Cicerone, 1992). The simulation-generated mosaic that best matched the data specified each observer's underlying cone mosaic. **Conclusions**. We show that this novel method can be used to estimate cone ratios as well as the separate topographies of L- and M-cones in the densely-packed photoreceptor array of fovea centralis.

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None.