

# **Macular pigment and visual performance under glare conditions.**

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**PURPOSE:** Many parameters of visual performance (e.g., contrast sensitivity) are compromised under glaring light conditions. Recent data indicate that macular pigment (MP) is strongly related to improvements in glare disability and photostress recovery based on a filtering mechanism. In this study, we assessed the causality of this relation by supplementing lutein and zeaxanthin for 6 months while measuring MP, glare disability, and photostress recovery. **METHODS:** Forty healthy subjects (mean age = 23.9) participated in the study. Subjects were followed for 6 months and assessed at baseline, 1, 2, 4, and 6 months. Spatial density profiles of MP were measured using heterochromatic flicker photometry. Disability glare was measured using a 1 degree-diameter circular grating surrounded by a broadband glare source (a xenon-white annulus). The intensity of the annulus (11 degree inner and 12 degree outer diameters) was adjusted by the subject until the grating target was no longer seen. For the photostress recovery experiment, the time required to detect a 1 degree-diameter grating stimulus after a 5-s exposure to a 2.5  $\mu\text{W}/\text{cm}^2$ , 5 degree-diameter disk was recorded. Subjects were tested under central viewing and eccentric viewing (10 degree temporal retina) conditions. **RESULTS:** At the baseline time point, MP optical density (OD) at 30' eccentricity ranged from 0.08 to 1.04, and was strongly correlated with improved visual performance in the two glare tasks. After 6 months of lutein (L) and zeaxanthin (Z) supplementation, average MPOD (at 30' eccentricity) had increased from 0.41 to 0.57, and was shown to significantly reduce the deleterious effects of glare for both the visual performance tasks assessed. **CONCLUSIONS:** MP is strongly related to improvements in glare disability and photostress recovery in a manner strongly consistent with its spectral absorption and spatial profile. Four to 6 months of 12 mg daily L + Z supplementation significantly increases MPOD and improves visual performance in glare for most subjects.

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