Discrimination thresholds for morphed objects in peripheral vision

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In previous work (Párraga et al, 2000 *Current Biology* **10** 35 - 38) we demonstrated that the human visual system is optimised to encode the second-order statistics of the visual environment. This was done psychophysically by measuring human discrimination thresholds for small spatial changes in stimuli with natural and unnatural Fourier statistics, by using a 'morphing' technique and assuming that the subject can direct his/her gaze at the region of interest so as to project this into the fovea.

However, we know that peripheral vision differs from foveal vision in the representation of spatial information (eg there is a marked change in the shape of the peripheral contrast sensitivity function compared to the foveal one) but we do not know how this would affect the ability to perform real tasks such as the one considered in our experiment.

Here, we extend our study to peripheral viewing. Three observers were presented monocularly with morphed objects and we measured their discrimination thresholds foveally and at 3 deg eccentricity. Our results show less evidence for optimisation to natural scenes in peripheral vision than in foveal vision. We conclude that there is a qualitative difference in discrimination strategy between the periphery and the fovea. [Supported by BBSRC.]