

AB071. Psychophysical investigation of dichoptic blur suppression in human vision

Alex S. Baldwin, Robert F. Hess

Department of Ophthalmology, McGill Vision Research, McGill University, Montréal, QC, Canada

Background: In situations where one eye gives a more blurred input to visual processing than the other, the input from the sharper eye tends to dominate the percept. This phenomenon has clinical relevance for monovision treatment, where the two eyes are corrected separately for different distances. We performed a psychophysical investigation of subjects' ability to identify which of a set of images was blurred in one eye.

Methods: We tested 17 subjects with normal or corrected-to-normal vision. On each trial, subjects viewed an array of four pictures using a monitor with shutter goggles. In the first experiment, three of the pictures were sharp in both eyes (distractors). The fourth picture was sharp in one eye and blurred by a low-pass filter in the other. Subjects identified that odd-one-out target over many trials with different degrees of blur. In the second experiment the target picture was given the same treatment, but the three non-target pictures were made monocular (sharp in one eye, mean grey in the other).

Results: The results from the first experiment with binocular distractors followed our expectations, with subjects showing better performance at detecting more severe blurs. In the second experiment with monocular distractors, we found large individual differences between our observers. Some performed the same as they did in the first condition, others now found the task impossible, and a few performed worse with severe blurs than they did with slight blurs.

Conclusions: Previous studies have reported individual differences in blur suppression, however this study reveals that these differences may depend on the precise details of the judgements being made.

Keywords: Blur; suppression; binocular; monocular; dichoptic

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