

AB013. The effects of monocular deprivation on the Pulfrich phenomenon

Sasha Novozhilova, Alexandre Reynaud, Robert F. Hess

Department of Ophthalmology and Visual Science, McGill University, Montreal, QC, Canada

Correspondence to: Robert F. Hess, PhD. McGill University, McGill Vision Research Unit, 687, avenue des Pins West, Montréal, QC H3A 1A1, Canada. Email: robert.hess@mcgill.ca.

Background: Short term monocular deprivation allows for the modulation of ocular dominance, such that the previously deprived eye contribution will increase, while that of non-deprived eye will decrease. This study examines the effects of short monocular occlusion on the Pulfrich phenomenon, an illusory perception of a horizontally moving object moving in an elliptical orbit in depth. In addition, we will explore whether the modulation of the Pulfrich effect is produced in the magnocellular pathway or the parvocellular pathway, by comparing two protocols, each designed to activate one pathway at a time.

Methods: The stimulus used throughout the experiment is made up of elements defining a cylinder rotating in depth, allowing to measure interocular delay. The task consists of reporting the direction of rotation of the stimulus presented. There are two different stimuli: the P

stimulus is composed of small elements oscillating slowly, which stimulates the parvocellular pathway, and the M stimulus which is composed of large elements oscillating rapidly which stimulates the magnocellular pathway. One experimental session consists of pre-patch testing, one hour of patching, and a post-patch testing. Each participant performs four sessions, both stimuli for each eye.

Results: The point of subjective equivalence (PSE) is extracted from psychometric functions obtained during pre-testing and post-testing. Following deprivation of the left eye the PSE shifts negatively, whereas deprivation of the right eye shifts the PSE positively on the psychometric function. This indicated that monocular deprivation slows the perceptual processes of the previously patched eye. The amplitude of this effect is larger for the M protocol than it is for the P protocol.

Conclusions: Contrary to expectations, results showed that effects of monocular deprivation are not exclusively mediated by contrast gain mechanisms, as suggested by Zhou and colleagues (2014). The amplitude of the differences observed for the M protocol suggest that the plasticity induced by short term deprivation is equally subjected to dynamic components.

Keywords: Monocular deprivation; plasticity; Pulfrich phenomenon; binocular vision

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