

Os textos são da exclusiva responsabilidade dos autores
All texts are of the exclusive responsibility of the authors

THE ROLE OF THE LATERAL OCCIPITAL AREA IN THE VISUAL PROCESSING OF OBJECT SIZE, SHAPE, AND ORIENTATION WITHIN AND OUTSIDE CONSCIOUS AWARENESS

Philippe Chouinard¹, Irene Sperandio² & Robin Laycock³

¹Institution: La Trobe University (Melbourne, Australia); ²University of East Anglia (Norwich, United Kingdom); ³RMIT University (Melbourne, Australia)

Grant 152/16

Background: What is and is not processed outside of conscious awareness is currently being increasingly investigated as the field begins to appreciate and understand more the involvement of different visual pathways in the brain.

Aims: Our project aimed to determine the degree to which different object characteristics and types of objects are processed subconsciously relative to when they are processed consciously and to determine the contribution of the lateral occipital complex (LOC) in some of these processes.

Method: Several behavioural experiments were carried out. The experiments used continuous flash suppression and more traditional visual masking paradigms to examine if the form, size, and orientation of objects, as well as words and emotionally salient stimuli, could be processed outside of conscious awareness. We also used functional magnetic resonance imaging (fMRI) to examine the contribution of different subdivisions of LOC in processing the form, size, and orientation of objects using an adaptation paradigm.

Results: The behavioural experiments revealed that words and emotionally salient stimuli are processed outside of conscious awareness but not the most basic features of objects, including their form, size and orientation, at least within the context of visual perception. Our fMRI experiment further revealed how different subdivisions in LOC contribute to the processing of form, size and orientation of objects during conscious awareness.

Conclusions: Taken together, our findings indicate that consciousness awareness is required for processing the basic features of objects, such as their form, size, and orientation, for perceptual purposes.

Keywords: Object features, Vision, Consciousness, Psychophysics, Functional magnetic resonance imaging.

Publications:

Cox, E. J., Sperandio, I., Laycock, R., & Chouinard, P. A. (2018). Conscious awareness is required for the perceptual discrimination of threatening animal stimuli: A visual masking and continuous flash suppression study. *Conscious Cogn*, 65, 280-292. doi:10.1016/j.concog.2018.09.008

Laycock, R., Sherman, J. A., Sperandio, I., & Chouinard, P. A. (2017). Size Aftereffects Are Eliminated When Adaptor Stimuli Are Prevented from Reaching Awareness by Continuous Flash Suppression. *Front Hum Neurosci*, 11, 479. doi:10.3389/fnhum.2017.00479

Peel, H. J., Sherman, J. A., Sperandio, I., Laycock, R., & Chouinard, P. A. (2019). Perceptual size discrimination requires awareness and late visual areas: A

continuous flash suppression and interocular transfer study. *Conscious Cogn*, 67, 77-85. doi:10.1016/j.concog.2018.11.012

Peel, H. J., Sperandio, I., Laycock, R., & Chouinard, P. A. (2018). Perceptual Discrimination of Basic Object Features Is Not Facilitated When Priming Stimuli Are Prevented from Reaching Awareness by Means of Visual Masking. *Front Integr Neurosci*, 12, 13. doi:10.3389/fnint.2018.00013

E-mail contact: p.chouinard@latrobe.edu.au