

The involvement of extra-striate areas in conscious vision as a function of response requirements: a Fast Optical Imaging investigation

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One of the major challenges of consciousness research is represented by the identification of the brain areas responsible for the emergence of visual awareness. In this framework, the present study aims at unraveling the spatio-temporal dynamics underlying conscious vision, disentangling them from confounding post-perceptual processing related to the response. To this goal, we employed a peculiar experimental design in which both awareness and motor response are manipulated. Specifically, participants performed a GO/NOGO detection task, in which they were asked to respond or withhold responding according to the experimental condition. Critically, during the performance of the task, participants' brain activity was recorded by means of Event-Related Optical Signal (EROS) technique, which provides accurate information about brain functions both from the temporal and spatial point of view, simultaneously. Results obtained from a small sample serving as a pilot for a registered report recently submitted showed that the Lateral Occipital Complex (LOC) plays a crucial role in conscious vision independently from the response requirement. In contrast, activity in primary visual cortex (V1) characterized the conscious condition only when the response was required. In general, these results advocate for a central role of LOC in conscious vision, suggesting that it could represent a reliable neural correlate of visual awareness, as opposed to V1, whose activity seems to be related to post-perceptual processes involved in the requirement of report.

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