

The Polymodal Role of Consciousness in Adaptive Action: A Paradigm for Neuroimaging

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Theoretical developments (e.g., Passive Frame Theory [PFT]) specify which stages of processing, from stimulus input to behavioral output, can occur unconsciously and which cannot transpire without involvement of the conscious field. In PFT, consciousness benefits action selection by enabling the response to one particular conscious content be influenced by the nature of the other conscious contents composing the field. This kind of contextually-sensitive processing yields “integrated action” (e.g., holding one’s breath while underwater).

Complementing PFT, the Reflexive Imagery Task (RIT [Bhangal, Geisler, & Morsella, In press]) reveals that conscious contents can enter the conscious field in an insuppressible, reflex-like manner. In the basic version of the RIT, subjects are told to not think of the name of a soon-to-be-presented visual object (e.g., a star). Subjects report (by button press) that they subvocalize the object name involuntarily on roughly 80% of trials.

To investigate the contextually-sensitive kind of processing the consciousness affords, we developed a more elaborate version of the RIT. Subjects indicated by button press the basic RIT effect but, in addition, they had to press another button if and only if (a) the subvocalization rhymed with a word held in mind (“STIR”), and 2) there was a solid border around the image (as opposed to a dotted border). In this RIT variant, accurate responding with the second button requires a host of poly-modal processing (e.g., subvocalization, prospective memory, and visual processing). Can subjects perform this task successfully?