Title: Neural Signatures of Conscious Face Perception: Evidence from Simultaneous EEG and fMRI

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Abstract:

Disentangling the neural correlates of consciousness (NCC) from those of task-related processes that precede or follow the experience (e.g., report) poses an ongoing challenge in consciousness research. The present simultaneous EEG-fMRI study examined this issue using a three-phase, no-report inattentional-blindness paradigm investigating face perception. In phase 1, participants performed a demanding distractor task while line drawings of faces and control stimuli were presented centrally. About forty percent of the participants reported inattentional blindness to the faces in phase 1, while the rest spontaneously noticed them. In phase 2, all participants were informed about the task-irrelevant faces, but performed the same distractor task. In phase 3, the faces became task-relevant. In EEG, the N170 component and the visual awareness negativity (VAN) covaried with conscious perception, while the P3b was primarily elicited by task relevance. In fMRI, inattentionally blind and aware subjects differed in fusiform gyrus and precuneus activity in phase 1, suggesting a central role of these structures in conscious face perception. In contrast, task relevance recruited different brain regions including fronto-parietal areas. Limitations and implications for the role of frontal brain structures in conscious perception are discussed.