Task relevance differentially shapes ventral visual stream sensitivity to visible and invisible faces

Top-down modulations of the visual cortex can be driven by task relevance. Yet, several accounts propose that the perceptual inferences underlying conscious recognition involve similar top-down modulations of sensory responses. Studying the pure impact of task relevance on sensory responses requires dissociating it from the top-down influences underlying conscious recognition. Here, using visual masking to abolish perceptual consciousness in humans, we report that functional magnetic resonance imaging (fMRI) responses to invisible faces in the fusiform gyrus are enhanced when they are task-relevant, but suppressed when they are task-irrelevant compared to other object categories. Under conscious perceptual conditions, task-related modulations were also present but drastically reduced, with visible faces always eliciting greater activity in the fusiform gyrus compared to other object categories. Thus, task relevance crucially shapes the sensitivity of fusiform regions to face stimuli, leading from enhancement to suppression of neural activity when the top-down influences accruing from conscious recognition are prevented.