

## The effects of attention to the contextual integration of objects and scenes

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Context of naturalistic scenes has the power to facilitate object processing in the human brain (Brandman & Peelen, 2017). The representation of objects in the human visual cortex is also strongly modulated by selective attention (Cohen & Tong, 2013). How attention influences the contextual integration of objects and scenes as well as the dynamics of this process remains unknown. To address this question we recorded brain activity of participants using Magnetoencephalography (MEG) while they were viewing degraded (blurred) objects alone or in their natural background preceded by a fixation cross. To manipulate selective attention we showed the same stimuli display in the center of the screen, but asked participants to perform two interleaved tasks: to respond when they see the fixation cross changing its luminance (object-unattended) or when an oddball appears instead of an image (object-attended).

The representation of object category (animate/inanimate) was measured by the multivariate response patterns across the scalp, for each point along the time-course of the neural response. Contextual facilitation was defined as the difference in decoding accuracy between objects with scenes and objects alone. This difference was significant for the object-attended condition at the late stage of object processing - at around 300 - 400 ms after stimulus onset and not for object-unattended condition. This reveals that selective attention is a prerequisite for the contextual facilitation of objects in scenes in the human brain. Present study demonstrates how the multivariate response patterns from MEG recordings may unveil temporal dynamics of attention effects on the contextual integration of objects in naturalistic scenes.