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Temporal Characteristics of Mental Imagery

Mental Imagery is the ability to perceive an image within one's mind in the absence of an external stimulus. The extent to which the mechanisms underlying perceptual processes overlap with those underlying mental imagery remains an open question. While some theories imply that mental imagery is generated from top-down mechanisms that impose representations across the visual system, others suggest that mental imagery involves the same bottom-up processes as in perception. To probe these theories, the present study used magnetoencephalography (MEG) to compare the time course of signals during perception and imagery. Participants viewed faces at different head orientations (looking left, centered, and looking right) and then imagined those same faces at the same set of orientations. Time-resolved MEG decoding methods allow us to compare brain MEG signal patterns between the different face orientations. In particular, we are comparing the ability to decode head orientation during both perception and imagery, as well as comparing cross-decoding between imagery and perception. Results from this study will help elucidate the evolving temporal characteristics of mental imagery.