Tracking the Spatiotemporal Neural Dynamics of Object Properties in the Human Brain

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Presentation Abstract Summary Real-world size and animacy are two major dimensions of object representation. Here, using representational similarity analysis (RSA), we combined high spatial resolution (fMRI) and high temporal resolution (MEG) brain data with theoretical models of the representational content (i.e. size and animacy). We find that animacy (starting ~ 160 msec) and physical object size (starting ~ 150 msec) are both represented in a shared network of regions, from occipital poles (VO, LO) to deeper ventral (fusiform) and medial-temporal structures (Parahippocampal cortex, PHC). Importantly, we find that the Parahippocampal cortex plays a central role in representing both properties over several hundreds of milliseconds, followed by sustained representations in the lateral occipital (LO), ventral occipital (VO) and fusiform. Early visual cortex (EVC) showed a sustained representation of physical object size but not animacy, starting ~150 msec. Resolving the spatio-temporal dynamics of object properties representation shall place new constraints on the computational architecture of visual cognition.

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