

Representational Dynamics: The Temporal Evolution of Neural Population Coding in Nonhuman Primate Inferior Temporal Cortex

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Submitter Marieke Mur
Affiliation MRC Cognition and Brain Sciences Unit

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Presentation Abstract Summary The primate visual system can be understood as a hierarchical feedforward system that transforms visual input into meaning via a range of linear and nonlinear transformations. The feedforward framework is very successful; however, it ignores temporal dynamics. Temporal dynamics might be highly relevant for object recognition. Here, we analyze single-unit recordings from monkey high-level visual cortex, i.e. inferior temporal cortex, to examine the temporal dynamics of neural population coding of object images. We show that both within- and between category distinctions arise early (80 ms after stimulus onset). Within-category distinctions can be explained by low-level features computed from the input image, while between-category distinctions cannot, especially at later time points after stimulus onset (> 125 ms). These results suggest that the IT code reflects both visual similarity and category distinctions and that the latter might require some recurrent processing to emerge.

Co-author Information

* Presenting Author

First Name	Last Name	Affiliation	E-mail
Marieke *	Mur *	MRC Cognition and Brain Sciences Unit	marieke.mur@mrc-cbu.cam.ac.uk
Andrew	Bell	MRC Cognition and Brain Sciences Unit; Department of Experimental Psychology, University of Oxford; Laboratory of Brain and Cognition, NIMH	andrew.bell@psy.ox.ac.uk

Nicholas	Malecek	Laboratory of Brain and Cognition, NIMH	nmalecek@gmail.com
Elyse	Morin	Laboratory of Brain and Cognition, NIMH	elyselouisemorin@gmail.com
John	Duncan	MRC Cognition and Brain Sciences Unit; Department of Experimental Psychology, University of Oxford	john.duncan@mrc-cbu.cam.ac.uk
Nikolaus	Kriegeskorte	MRC Cognition and Brain Sciences Unit	nikolaus.kriegeskorte@mrc-cbu.cam.ac.uk

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