Tracking Working Memory Content Processing with MEG

Submission ID 3000177

Submission Type Poster

Topic Neuroscience

Status Submitted

Submitter Romain Quentin

Affiliation NINDS/NIH

SUBMISSION DETAILS

Presentation Type Either Poster or Oral Presentation

Presentation Abstract Summary Intra-cortical recordings and functional MRI studies have demonstrated the involvement of an extended group of cortical and subcortical brain areas during working memory. However, the format of maintained representations and the ways by which the brain selects, modifies and recalls these memory has proved remarkably difficult to unravel. In this experiment, we investigated with magneto-encephalography (MEG) the spatiotemporal dynamics of memory content and recall. Two visual gratings with different orientations and spatial frequencies were flashed to the participants. After a short delay, a post-cue instruction indicated which visual feature (spatial frequency or orientation) of which stimulus (left or right) the participant should remember for a subsequent memory task. We applied machine-learning algorithms to decode, from the MEG brain signal, 1) the visual features of the stimuli immediately after their presentation; 2) the rule that specified the visual feature to remember and 3) critically the specific visual contents selected for a subsequent memory task. We report that working memory contents and their task-related transformations can be selectively tracked from the prefrontal activity. These results pave the way to understand the mechanisms that allow our brain to manipulate its own memory contents.

Paper Upload (PDF) abstract_CCN2017.pdf

Co-author Information

* Presenting Author

First Name	Last Name	Affiliation	E-mail
Romain *	Quentin *	NINDS/NIH	rom.quentin@gmail.com
Jean-Remi	King	NYU	jeanremi.king@gmail.com
Sallard	Etienne	NINDS/NIH	etienne.sallard@nih.gov
Fishman	Nathan	NINDS/NIH	nathan.fishman@nih.gov
Buch	Ethan	NINDS/NIH	buche@ninds.nih.gov

Thompson	Ryan	NINDS/NIH	ryan.thompson2@nih.gov
Cohen	Leonardo	NINDS/NIH	CohenL@ninds.nih.gov

Keywords

Keywords
working-memory
MEG
decoding
Visual encoding