Spinoza Centre for Neuroimaging

Spinoza Centre for Neuroimaging
Meibergdreef 75
1105 BK Amsterdam, Netherlands
j.heij@herseninstituut.knaw.nl

Dr. Simona Fiorani
Editor-in-chief
iScience

April 19th, 2023

Dear Editor-in-Chief,

We wish to submit an original article entitled "*Contextual responses drive a unique laminar signature in human V1*", for consideration at iScience following a positive pre-submission inquiry (contact: Yongmei Sun).

We confirm that this work is original and has not been published elsewhere, nor is it currently under consideration for publication elsewhere. We also have no conflicts of interest to disclose.

Neuronal populations balance stimulus-driven input and context-related input from neighboring neurons. These types of inputs are transmitted by cortical projections in different layers of the cortex. The spatial resolution of contemporary laminar fMRI at 7T is not sufficient to adequately separate responses originating from these layers. Here we combine line-scanning fMRI with a novel cortical targeting approach to record responses across cortical depth in living humans with unprecedented detail.

For each subject, we selected a specific patch of cortex with known functional properties. We custom-design stimuli that were differentially biased towards the stimulus-driven or the context-related input. We find that context-related stimuli elicited responses at upper and deeper cortical depths – sites associated with feedback processing. These results corroborate invasive anatomical and animal neurophysiological experiments, highlighting our ability to bridge the two approaches. Such an approach opens the door to cognitive manipulations in humans.

Correspondence concerning this manuscript can be addressed to j.heij@herseninstituut.knaw.nl.

Thank you for consideration of this manuscript.

Sincerely,

On behalf of the co-authors,

Jurjen Heij