

Metacognitive Link Between Detection and Discrimination Tasks

～Does Detection of Target Involve Higher-Order Mechanisms?～

概要

The ability to monitor our cognitive processes, called metacognition, has been studied using discrimination and detection tasks, sometimes with confusion. Here we show that the two tasks involve different cognitive mechanisms and that only the detection task shares mechanisms and substrate with the evaluation of our own decisions.

特徴

- We observed a link between the detection task and metacognition but the absence of such link in discrimination task. Also, the detection task seems surprisingly harder than the discrimination task.
- Using a whole-brain decoding approach on fMRI data, we highlighted the neural difference between the detection and discrimination tasks, especially in visual and frontal areas of the brain.
- Decoders trained using prefrontal areas of the brain were able to classify both detection and confidence responses but not discrimination responses.

今後の展開

- With cross decoding technics, we will be able to see if the neural patterns for detection task are similar to the neural pattern of confidence judgment in the prefrontal areas of the brain.

テーマ「Society5.0への貢献～サイバーとフィジカルの融合に向けて～」との関連

- This research helps us shed light on metacognitive functions. An improved understanding of the way we reason will benefit education and people of all age, as well as the creation of smarter autonomous systems.

