基礎研究

N10　脳情報科学

Impact of Perception Uncertainty on Abstraction During Learning

～A Modelling Approach Using Mixture-of-Experts Architectures～

概要

Abstraction is the ability to organize information beyond the sensory level. When learning, abstract representations are eventually built to perform a task. In previous work, visual stimuli used were deterministic so easy to identify. Here we introduce noise in these stimuli to unveil the impact of perceptual uncertainty on the use of abstract representations.

特徴

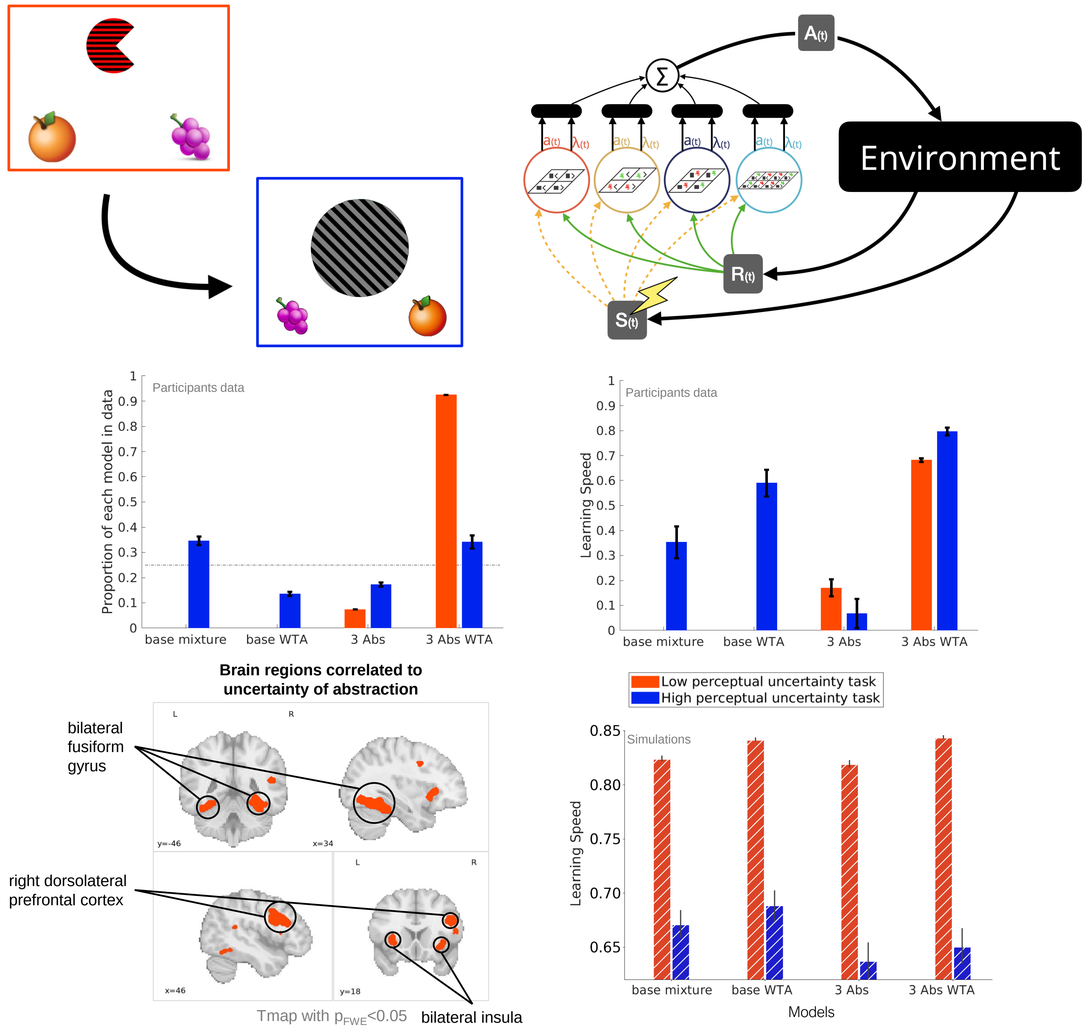
- When perceptual uncertainty is high, people more often use all the visual features of the stimulus, whereas when perception is clear, abstract representations seem sufficient.
- In participants and simulations, it is more efficient to act according to the most probable model of the environment rather than decide from a mixture of all representations available.
- Neural ties to abstraction uncertainty, via the inverse of the difference between all-features and the best abstract map's responsibility signals in mixture of expert model, involve areas for visual processing, attention and metacognition.

今後の展開

- Collection of more human behavioral and neural data together with their further analysis will help us improve our computational models to know more about the impact of uncertainty on abstraction mechanisms.

テーマ「ともに究め、明日の社会を拓く」との関連

- This research helps us to better understand learning and abstraction abilities. An improved knowledge of the way we reason will benefit education and people of all age, as well as the creation of smarter autonomous systems.



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