fMRI: Applications in metacognition

Rozita Aboutorabi
Ferdowsi University of Mashhad, Iran

This probe studies the application of fMRI in different areas of metacognition, such as memory and perception, feeling confidence, judgment, decision making, meta-knowledge, and meta-control. The results show that accurate introspection in perception and memory is related to the neural networks landed in the medial and lateral regions of the aPFC; and a network associated with high vs. low confidence includes mPFC and lPFC, precuneus, and insula. Also, prospective judgments were associated with the posterior mPFC, left dlPFC, and right insula, and retrospective judgments were associated with the bilateral parahippocampal cortex and left inferior frontal gyrus. The anterior PFC, including the dorsal anterior cingulate cortex (dACC) and lateral frontopolar cortex (lFPC), show more activation after the initial decision as well. In addition, a specific set of regions is recognized to be involved in offline meta-knowledge (aPFC, Precuneus, Parahippocampal gyrus, rlPC, dlPFC, Insula), online meta-knowledge (PMFC, ACC), offline meta-control(lPFC) and online meta-control(vlPFC).As these areas are the regions that are damaged in AD and some other diseases, the author believes that training metacognition skills can improve cognition in these patients.

The current research discloses a new way to prevent and treat cognitive diseases. As there are no definitive treatments for AD and some other cognitive diseases, behavioral interventions can be considered substantial. So, the author by disclosing the areas involved in metacognition, and comparing these areas with areas damaged by cognitive diseases like AD, proposes training metacognition skills as a prevention and treatment method.

Biography

Rozita Aboutorabi has her expertise in educational philosophy and passion for hermeneutical phenomenology. Her open and contextual educational model based on Heidegger's viewpoint about human beings and his understanding of the surrounded world in "Being & Time" creates new pathways for improving education. She has built this model after years of experience in research, teaching, and philosophizing in the educational implications on Heidegger's view. She is enthusiastic about neuroscience, and she is doing research on metacognition as well. She is a hard-working persistent researcher who has a very exact plan for every step of the way and is strict on sticking to them. She disclosed the overlaps of these two fields. This approach is responsive to all stakeholders and has a different way of focusing. Hope that the results of this research can lead to changes in educational fields and give them new insights to prevent and treat cognitive diseases.