Functional Organization of the Human Brain
A Window into the Architecture of the Mind
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MODULARITY OF MIND AND BRAIN AND THE CASE OF THE FFA
Salle des Actes, École normale supérieure
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Remise du Prix Jean-Nicod et cocktail après la conférence

WHAT OTHER MENTAL FUNCTIONS GET THEIR OWN PRIVATE PATCH OF REAL ESTATE IN THE BRAIN?
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Jeudi 7 décembre
MODULARITY OF MIND AND BRAIN AND THE CASE OF THE FFA

Is the human mind structured, and if so what is that structure? Here I consider the case of face perception, charting the many lines of evidence that specialized neural machinery in the fusiform gyrus (FFA) plays a specific and causal role in the perception and recognition of faces. We found that the FFA responds twice as strongly to faces as to any other stimuli. The response of this region is correlated with awareness of a face in binocular rivalry, modulated by spatial and object-based attention, and selectively increased when people closed their eyes and simply imagine faces. Electrical stimulation of the FFA produces a face percept, demonstrating the selective causal role of this region in face perception. Hence, at least one patch of the human brain is extremely specific for the single mental function of face perception. But are there other mental functions that are as specific?

Vendredi 8 décembre
WHAT OTHER MENTAL FUNCTIONS GET THEIR OWN PRIVATE PATCH OF REAL ESTATE IN THE BRAIN?

Here I shall fill out the picture of the human brain as containing a large number of regions that are highly specialized for particular mental functions, such as the extrastriate body area, the parahippocampal place area, as well as areas in auditory cortex for music, and in high-level visual cortex for food. Other regions are specialized in yet higher-level functions, including the perception of third-party social interactions and intuitive physics. Furthermore, theory of mind has been shown to have a distinctive developmental trajectory and a selective deficit in autism, and now a private patch of brain as well in the right temporoparietal junction. Finally, the brain regions specific to language show almost no response during other high-level cognitive processes, including working memory and cognitive control. Thus, language and thought are not the same thing in the brain.

Mardi 12 décembre
HOW DOES ALL THIS FUNCTIONAL ORGANIZATION ARISE OVER DEVELOPMENT?

My account of the biological basis and origin of subjective experience has two elements. Part of the explanation is given in terms of the evolution of agency and subjectivity, as features of the animal way of being, and another part involves some particular characteristics of nervous systems. The evolutionary history of animals functions in my account as a constraint and a resource. I argue that there is probably a broad distribution of subjective experiences across different kinds of animals, both past and present, though the usual «yes or no» question will probably have to be replaced in a framework that recognizes gradual change and graded presence. Some specific groups will be discussed, including cephalopods and various arthropods, as well as vertebrates.