

# Investigating the neurobiology of value-based decision-making

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## **Abstract**

According to economic theories, preference for one item over others reveals its rank value on a common scale. This value is the core variable of neuro-economics, and presumably determines most properties of our behavior.

In the first part of this talk, I will present several studies combining behavioral experiments and functional neuroimaging in humans, providing evidence that the VMPFC encodes the core variable of economic decision-making: values. The main goal of these first studies is to decipher the properties of this brain valuation system and its interaction with other systems, in order to understand some human decision biases. More specifically, I will show that the brain valuation system is automatic, generic and personal. Then, I will evidence how interactions between the valuation system and the mirror neuron system can give rise to mimetic desire, and how the episodic memory system contributes to patience in inter-temporal choices.

In the second part of the talk, I will then present some more recent lines of work, which challenge (or attempt to challenge) this simple “toy” model where values are the main determinant of behavior, and are simply represented in the VMPFC. I will notably present an extensive re-analysis of several datasets arguing that the brain valuation system may encode other decision variables like confidence.

Pursuing these investigations on the neurobiological processing of values might provide relevant leads to explain why we often behave in an irrational way, yield to impulsive and maladaptive choices, or sink into apathy.