**Absolute or relative?**

**Neural coding of reward probability in the ventromedial prefrontal cortex**

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Single-unit electrophysiology studies suggested that, when engaged in value-based decisions, neurons in the orbitofrontal cortex (OFC) encode the value associated with different options under consideration. In particular, OFC neurons seem to represent a relative-value code that could be explained by the range of values the animals experience in the recent past. It is less known, however, whether and how such range-adapting property would hold in the domain of probability of reward. In this study, using fMRI in humans, we systematically manipulated the range of reward probabilities to investigate value coding properties in the valuation system.

Methods. In a simple probabilistic learning task, the subjects were required to learn information about probability of reward associated with different visual stimuli. In each trial, the subjects were first presented with a visual stimulus followed by a feedback on whether s/he received a monetary reward. The key manipulation was the range of reward probabilities assigned to different blocks of trials. There were three range conditions. Each condition consisted of 2 stimuli representing 2 different probabilities of reward. In range 1 condition, the probabilities were 10% and 50%. In range 2 condition, the probabilities were 10% and 90%. In range 3 condition, the probabilities were 50% and 90%. Each condition was assigned to 2 blocks of 30 trials each. The order of blocks was randomized for each subject.

Results. Twenty-two subjects participated in the experiment. Behavioral results. Subjects gave higher probability estimates when reward probability was higher. We analyze the reward history for different symbols, and find out that there is an exponential decay for the weighting of reward history especially in 50%. Neural results. For each level of probability, we did not find any region that responded differently as a result of range. Instead, we found that activity in the ventromedial prefrontal cortex (vmPFC) encoded reward probability in an approximately linear fashion independent of context. Furthermore, the amplitude of responses in vmPFC increased as function of reward expectation for range blocks. We concluded that vmPFC exhibits context independent property for coding reward probability.

**Acute testosterone effect on moral judgment**

**Pin-Chia Huang**

Behavioral endocrinogy research suggests that testosterone may play a role in moral judgment. Previous studies indicated that a single-dose testosterone in young women may influence their social interaction(e.g., decreases affective empathy with the facial mimicry paradigm, decreases trust independently of any effects of treatment on risk or ambiguity tolerance, decreases cognitive empathy; increases amygdala response to fearful and happy faces, increases visuospatial ability tested with the 3-D Mental Rotations Test) .

We tested the acute testosterone effect on moral judgment. We predicted and found that participants after testosterone administration are more likely to make utilitarian moral judgment.

**The effect of 5-HTTLPR polymorphism
on trait anxiety and emotional mismatch negativity in Han Chinese population**

**Cheng-Yi Su**

The correlation between 5-HTTLPR and trait anxiety has been studied for a long time. The effect of single genetic polymorphism on a complex behavior traits are dynamically moderated by other genetic variants as well as environmental and epigenetic factors. The brain activity related to genetic polymorphism may be a better predictive marker of the complex trait. In this study, we investigated the correlation among 5-HTTLPR, emotional MMN and trait anxiety.