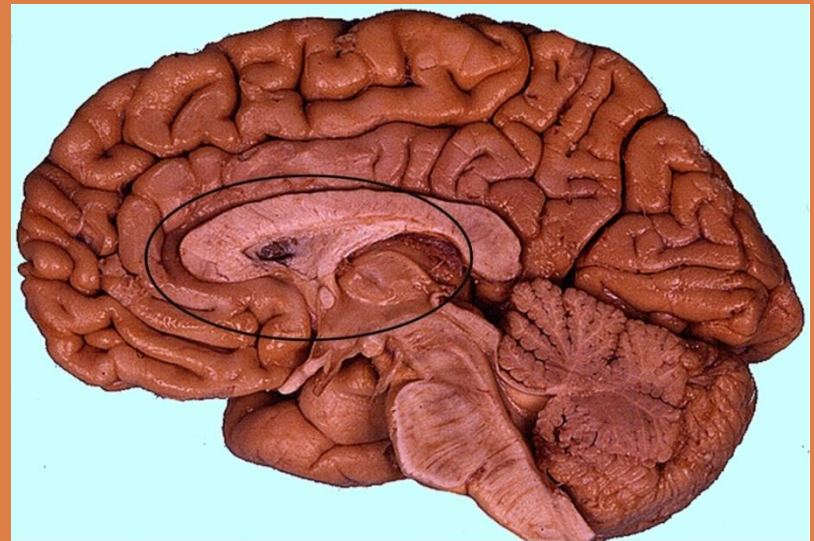


# THE INFLUENCE OF REWARD EXPECTATION ON THE REWARD PROCESSING SYSTEM

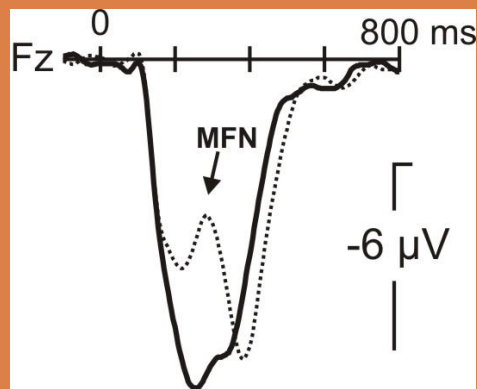
Outline of the project

# Reward and Punishment

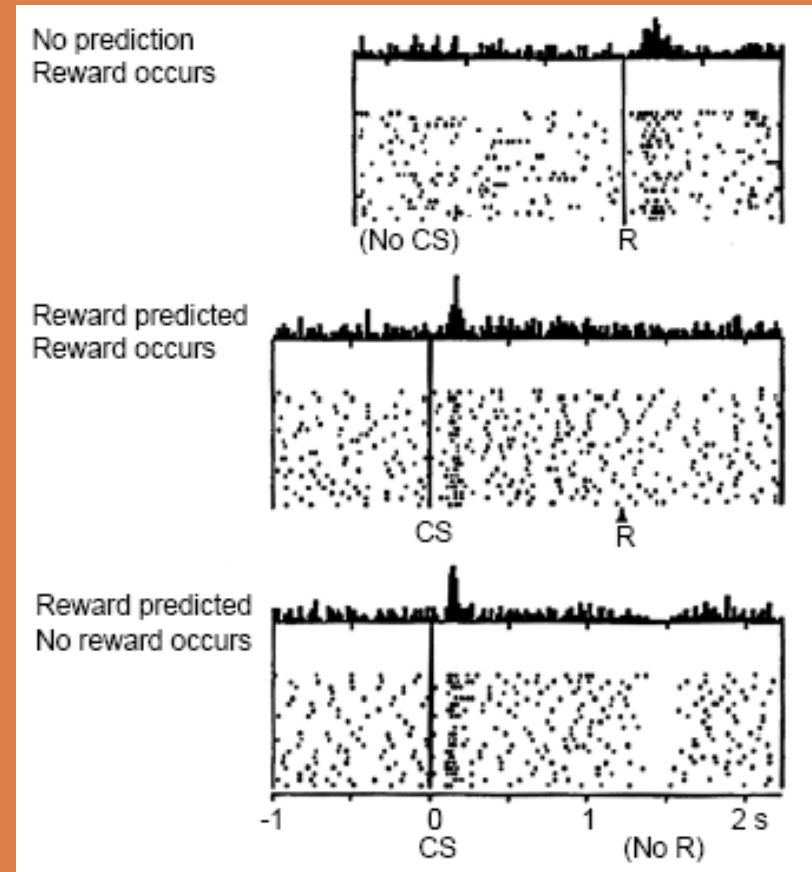
- *Uncertainty, prediction and behavior adaptation*
- *Positive and negative feedbacks*
  - *Guide behavior and mediate learning*
- *The brain circuits*
  - *Orbitofrontal cortex, amygdala, ventral striatum, NAcc, Prefrontal cortex and ACC*
- *Specific roles of each part*



- Reward and error prediction
- The projection of dopaminergic neurons
- Medial Frontal Negativity
  - Expectations



ERP for gains (thick lines) and losses (dotted lines) in a gambling task (Marco Pallares et al,07)



Do dopamine neurons report an error in the prediction of rewards?(Schultz et al,97)

# Objectives

- Study the influence of expectations of the result in the reward and punishment processing mechanism
  - Part1
    - Modulation of the response in cortical areas
    - Frequency band differences in the response in different conditions
  - Part 2
    - Identification of specific areas activated in response to gains and losses
    - Identification of specific areas activated in response to errors

# Hypothesis

- Gains and losses are processed differently
- Expectations also modify the response
  - Probability
    - In the conditions that are better or worse than expected, there will be a modification in the observed activation
  - Magnitude
    - In maximum losses and gains there will be a modification in the response compared to minimum gains and losses

# Material and methods

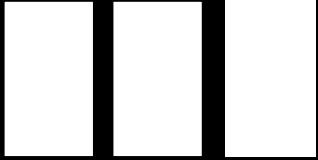
- 20 subjects, without history of addiction or diseases that may influence the reward processing system
- Subjects will make a task in which they play for real money
- What they win/lose will be added/subtracted from the money that they are paid for their participation
- Neuroimaging technique:
  - Part 1: EEG
  - Part 2: fMRI

# Design

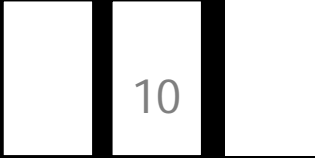
- A cue with the information on magnitude and probability
- Choose the card
- Receive the feedback
- Next trial
- Times should be enough to see the result of processing

1

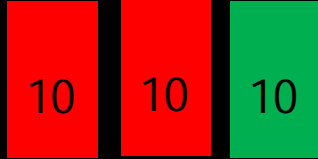
1 sec



Reaction Time



1~1.2 sec



1.5sec

2

# Problems

- Motivation
- Do they keep the expectations to the end?
- If we want to study the same process with two techniques, the experiment should be adaptable for both in a way that activate the same mechanisms.



Thank You!

