**behav\_fMRI.mat**

Behavioral data of the main experiment (matlab data)

**behav\_pilot1.mat**

Behavioral data of Pilot Study 1 reported in SI.6 (matlab data)

**behav\_pilot2.mat**

Behavioral data of Pilot Study 2 reported in SI.6 (matlab data)

**behav\_pilot3.mat**

Behavioral data of Pilot Study 3 reported in SI.6 (matlab data)

**behav\_3options.mat**

Behavioral data of the three-option experiment reported in SI.7 and 8 (matlab data)

The variable ‘behavior’ contains the following fields. Each field contains n cells of data from n participants.

* 'response\_pos'
  + The corresponding quadrant of the response. 1: top-left; 2: top-right; 3: bottom-left; 4: bottom-right
* 'gain'
  + The probabilistic gain associated with the choice.
* 'trial\_type'
  + 1: two-option trials
  + 2: distractor trials
  + 3: three-option trials (where all three options were chooseable)
* 'RT'
  + Reaction time in ms
* 'rews'
  + The reward magnitude of the HV LV and D options respectively (column) on each trial (row)
* 'probs'
  + The reward probability of the HV LV and D options respectively (column) on each trial (row)
* 'vals'
  + The expected value (i.e. magnitude × probability) of the HV LV and D options respectively (column) on each trial (row)
* 'response\_invalid'
  + 1: invalid response; 0: valid response
* 'response\_invalid\_slow'
  + 1: invalid response due to no response; 0: other kinds of response
* 'response\_invalid\_distractor'
  + 1: invalid response due to the choice of a distractor; 0: other kinds of response
* 'response\_invalid\_empty'
  + 1: invalid response due to the choice of an empty quadrant; 0: other kinds of response
* 'pos'
  + The positions of the HV LV and D options respectively (column) on each trial (row). 1: top-left; 2: top-right; 3: bottom-left; 4: bottom-right
* 'HV'
  + Value of the HV option. Identical to the first column of ‘vals’
* 'LV'
  + Value of the LV option. Identical to the second column of ‘vals’
* 'D'
  + Value of the D option. Identical to the third column of ‘vals’
* 'accuracy'
  + Choice accuracy. 1: chosen the HV option; 0: chosen the LV option.