1 Preliminaries

This is the documentation for the fMRI Experiment on risk perception for Flavia Filimon in 2014.

It is dedicated to explain the structure of the experimental program and the parameters of the experiment and gives a step by step manual to operate the experiment.

The program consists of several files:

- trial_parameters.py: contains all parameters of the experiment. If something can be set, it is set there.

- randomization.py: a script to generate the timing and balancing information for the experiment run that are then stored in the run_parameters folder.

- run_trial.py: the script to start the experiment.

- trial_classes.py: contains all the classes and routines for presentation of visuals and sound to the participant, the logging of participant input and the output of timestamped information.

- timestamp_comprehension_v1.py and timestamp_comprehension_v2.py: scripts to disassemble the timestamped output from the experiment for the regressor based analysis of fMRI data.

2 Parameters

The trial_parameters.py contains ALL parameters that are in use in the experiment (timing, randomization, difficulties, position and size of visual objects etc.).

The trial_parameters.py files is designed to be self explanatory. It is structured in different sections for parameters concerning different parts of the experiment:

- Difficulties and Rewards

- Parameters for different tasks (Auditory, visual and arithmetic)

- Trial timing

- Settings for randomization (number of runs, blocks and trials per block, trial types)

- Default settings for participant ID and run number

- Input keys, start and escape signals

- File locations

- Eye Tracker settings

- Position and size of visual elements

For each parameter there is a short explanation of its function.

3 Randomization and Balancing

The randomization is done via the randomization.py script. To use it, all parameters must be set within the trial_parameters.py file. The one opens up a terminal, navigates to the folder where the script is stored and runs it via "python randomization.py". The script creates several sets of experiment parameters (timing, balancing information) and stores them in 'run_parameters/'. It thereby randomizes the timings of the delay and baseline according to a geometric distribution with given means while making sure, that the given number of "long" delays is present for each condition.
It also balances the appearance of easy and hard tasks (first or second), the order of trials in terms of small and large EV gaps and the assignment of the high/low EV to the hard/easy task.

4 How to Use the Program - Step by Step

These are step by step instructions for the usage of the experiment software:

1 Make sure the necessary software is installed on the experimental machine. This includes Psychopy, eyelink, pylink, matplotlib and their dependencies.

2 Make all settings for the experiment within the trial_parameters.py file.

3 Open a termal navigate to the location of the experiment program and run it with "python run_trial.py".

4 Strap the participant into the machine.

5 Check the settings for the participant ID, the difficulty settings and the run number, change them if necessary and hit OK.

5 Wait for the eye tracker initialization (if it is connected).

6 If the eye tracker is initialized the program waits for the human start signal.

7 If the human start signal is given, the program waits for the fMRI start signal.

8 If the fMRI start signal is received, the program subsequently presents the trials to the participant.

9 After the experiment finished, run the timestamp comprehension routine on the timestamp output via "python timestamp_comprehension_1.py #timestamp_file.txt" or "python timestamp_comprehension_2.py #timestamp_file.txt" to obtain the output files for the different regressors/groups of regressors