README for passive.py

The main goal of this file is to run the passive phase of a session (see figure 1 in the 'Run' README file). The passive phase consists of instructions, passive trials, and no-brainer trials. The instructions are only shown at the beginning of both the first passive phase trial and the first no-brainer trial. The passive phase is expected to give clear behavioral and neural results as the input is fully controlled.

The passive phase of a session consists of three sets of 45 trials where the participant is shown a fractal, after which their wealth is changed accordingly. During this phase, the participant learns how a particular fractal influences their wealth. After 45 trials, the participants' wealth is reset to the starting value of 1000 points, and the no-brainer trials are initiated. The passive phase file consists of two main parts: Create_GUI, and Run_passive_phase.

In the part Create_GUI, the workspace needed to run the passive phase of the experiment is created, and a dictionary for the passive phase is returned. The input arguments needed are the directory path of the output, the configuration of the experiment, and the question of opening the GUI or not, which defaults to True. The experiment configuration is updated by parsing the GUI inputs into relevant variables. Furthermore, the filename for the results of the passive phase is generated, the calibration is run or loaded, and the expected number of MR images is calculated using the time of repetition (TR). This returns the completed dictionary needed for the passive phase.

In the part Run_passive_phase, the input arguments are the experiment configuration variables, the output directory, the PsychoPy window, the pre-generated list of fractals, and the duration of a fractal being shown during a passive trial. Before the passive phase can start, all these arguments must be set up and checked. The experiment configuration variables are updated or generated, and the list of pre-generated fractals is loaded into the workspace and copied to prevent accidental alterations during the experiment.

Last, the logger is generated and added to the dictionary. In this logger, all information about changes in the screen, fractals, button presses, the wheel, the money frame, the money box, and the necessity of a reminder for engagement through a button press are saved. The timing of all these variables is specified in the configuration file.

Now, the passive phase is initiated with the instructions. After the instructions are shown, the wheel, money frame, and money box are set up to be employed during every trial. Last, the global clock in the logger is restarted to allow for alignment of the results. During every trial in the passive phase, the values for gamma (growth rate) and eta (dynamic of the session), the fractal, the response, and the wealth change are logged.

A trial in the passive phase consists of an inter-trial interval (ITI), a cue onset, a response (including an allowance of 1 second while waiting for a response), if necessary, a reminder to press earlier, the spinning of the wheel (whose length is determined by the speed of the response), the onset of the fractal, and the appropriate wealth update (while the fractal is still being shown). At the end of the trial, both the fractal and the money box with its wealth disappear last.

After a set of 45 passive trials, 15 no-brainer trials are run through. The first set of no-brainer trials is preceded by some instructions for the participant. The aim of the no-brainer trials is to assess whether the participant has learned how a certain fractal influences their wealth during the passive phase. The participant is therefore presented with two fractals and has to choose one of them with the aim of increasing their wealth.

The no-brainer trials are set up similarly to the passive trials. They consist of an ITI, after which both fractals appear, first the left one and then the right one. Now a response window appears, where the participant selects one of the fractals, or, if necessary, a warning to choose earlier next time is shown. Afterward, the wealth is updated according to the fractal chosen by the participant. This is the end of a no-brainer trial; both the passive trials and the no-brainer trials are executed a total of three times.