README for active.py

The main goal of this file is to run the active phase of a session (see figure 1 in the 'Run' README file). The active phase consists of instructions and active trials. The instructions are only shown before the first active trial. The active phase is expected to give both behavioral and neural results that are similar to the passive phase results; however, because the input is not fully controlled and depends on the participants' choices, this is uncertain.

The active phase of a session consists of 160 trials where the participant is shown four fractals, presented in two gamble pairs. After they have chosen a pair, one of the fractals is randomly chosen with a coin toss, after which their wealth is changed accordingly. During this phase, the participant applies their knowledge, which they acquired during the passive phase of the same session. The participants' wealth is equal to 1000 points at the beginning of the active phase, and their total points after the 160th trial give their final score. The active phase file consists of two main parts: Create_GUI, and Run_passive_phase.

In the part <u>Create_GUI</u>, the dictionary for the active phase is created. This allows for looking up previous files and loading in data from previous runs or the continuation of a previous state of the experiment. The input arguments needed are the directory path of the output, the new configuration file for the active phase of the experiment, and the question of opening the GUI or not, which defaults to True. The experiment configuration is a summary of the trial information needed to run and log data. It contains information about the session, the participant, the phase, and the dynamic.

All this information is updated by parsing the GUI inputs into relevant variables. Furthermore, the filename for the results of the active phase is generated, and the calibration is either run or loaded. The expected number of MR images is calculated using the time or repetition (TR). This returns the dictionary needed to run the active phase.

In the part <u>Run_active_phase</u>, the input arguments are the configurations, the path to the output directory, the PsychoPy window, the pre-generated list of fractals, and the duration of a single frame (1/Hz). Before the active phase can start, all these arguments must be set up and checked. This part only returns information about whether the experiment terminated normally or prematurely due to a boundary condition being reached. For the active phase to be run, some of the configurations are overwritten, and specific file paths are generated for every participant individually. Furthermore, it is tested whether the necessary fractals are present, and whether the number of fractals is as expected for the active run to be initiated. The list of fractals is the same for the passive and active phases of the same session.

Before the active phase can be run, the fractals, logger, autopilot, and waiting tools are initiated. All the images to be used on the screen during an active trial are preloaded, including the fractals, the timeline, the moneybox, the wealth, the reminder, and the timer. Now, the active phase is initiated with the instructions. These explain what the participant has to do during the active run and what a single trial in the active run looks like. Afterward, the trial clock is reset, the elements are set up, and the active phase is initiated.

As the active phase is initiated, the logger is set up to be updated continuously. For every trial, the information about the trial duration, the fractals, the growth rates of every fractal, the indifference eta's for every fractal, the onset of the gamble pairs, and the coin toss are included in the logger. Every trial is preceded by an Inter-Trial Interval (ITI), after which the gamble pairs are presented.

First, only the gamble pair on the left is shown, the gamble pair on the right is shown slightly later. When both gamble pairs have been presented to the participant, the response cue and the response window are shown. In the response window, a timer assesses the time it takes the participant to make a choice between the gamble pairs and to make sure that the participant makes a choice within the indicated (very short) time frame.

When the participant has chosen a gamble pair, the following information is included in the logger: the chosen expected growth rate (the mean value of the growth rates of the fractals included in the chosen gamble pair), the response time, all four fractals, and the result of the coin toss. Through the coin toss, the final fractal is selected. In the event that the participant does not make a choice between the gamble pairs in time, the gamble pair with the fractal with the worst growth rate is automatically chosen. Using the growth rate from the selected fractal, the wealth is updated accordingly and displayed in the money box on the screen. At the end of every trial, the fractals and the coin toss are reset and preloaded anew for the next trial. After the 160th trial of the active phase is completed, the final wealth collected by the participant is shown on the screen. Here, the active phase is terminated and completed.

After a participant has completed all the sessions they are taking part in, they are asked to fill out some questionnaires: the DOmain SPecific Risk Taking (DOSPERT) questionnaire and the propensity test. Those questionnaires are used to assess the participants' personal risk preferences in the real world. The results are then correlated with the choices they have made during the active phase of the session, and this correlation can be used to ascertain whether participants make choices according to a personal risk preference or a common risk preference.