

Study Registration

For the Koestler Parapsychology Unit Study Registry

The registration information for the study is given below. Each section can be expanded as needed.

1. The title or name of the experiment (for listing the experiment in the registry).

Pupil dilation prediction of random negative events. Can they be avoided?

2. The name, affiliation, and email address for the lead experimenter(s) for the study.

Patrizio Tressoldi, Dipartimento di Psicologia Generale, Università di Padova

Patrizio.tressoldi@unipd.it

3. A short description or abstract of the purpose and design of the experiment.

This experiments will test if pupil dilation can predict the appearance of one neutral image (a smile) and a negative one (a gun associated with an acoustic “bang”). When a negative stimulus is predicted, it will be blocked and not presented. This experiment is fundamental to test if prediction is based on an anticipation of future sensory stimulation or simply of its “potential” emotional value.

4. A statement or list of the specific hypothesis or hypotheses being tested, and whether each hypothesis is confirmatory or exploratory.

In this experiment we will test a single confirmatory hypothesis, namely that pupil dilation can predict and avoid potential negative stimulation

5. The planned number of participants and the number of trials per participant.

With an expected effect size of 0.25 and a statistical power >0.80 , we plan to test 100 participants. Each participants will perform 20 trials

6. A statement that the registration is submitted prior to testing the first participant, or indicating the number of participants tested when the registration (or revision to the registration) was submitted.

This registration is submitted prior to testing the first participant

In addition to the minimum content above, further information is highly recommended, particularly for well-planned confirmatory experiments. The additional information includes some or all of the following:

7. The specific statistical test method that is planned for each hypothesis, including any adjustment for multiple analyses. (Can be included in section 4 above.)

The main hypothesis, that is if the percentage of correct prediction of the negative stimuli is better than chance, corresponding to 50%, will be tested using both a frequentist (effect size and corresponding 95% CI of the hits/trial difference) and a Bayesian statistical approach (Bayes Factor and parameters estimation using uniform beta and Jeffreys-Zellner -Siow, priors)

8. The power analysis or other justification for the number of participants and trials.

See point 5

9. The methods for randomization in the experiment.

Randomization will be implemented using the randomization algorithm built in in EPrime® 2.0, resetted after each of the 20 trials

10. A detailed description of the experimental procedure.

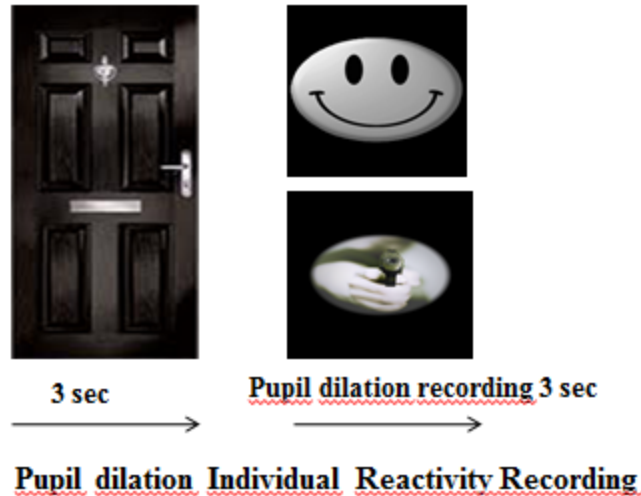
Procedure

Each participant will be seated in front of a 19 inch monitor in a sound and light attenuated lab.

Before the formal sessions, each participant will be informed as follow: "Before the formal experiment, we must record your personal pupil dilation reactivity to the two types of stimuli you will see behind the door. You must simply watch what will happen on the screen without doing nothing. When the door opens, you will see a gun shooting

on you hearing a shot or you will see a smile. You will see ten times the shooting gun and ten times the smile, presented randomly”.

After the calibration using a Tobii120® eye-tracker, the task will start with the individual reactivity recording phase (IRR). The sequence of events is presented in Figure 1a. Inter item interval was 3 sec.

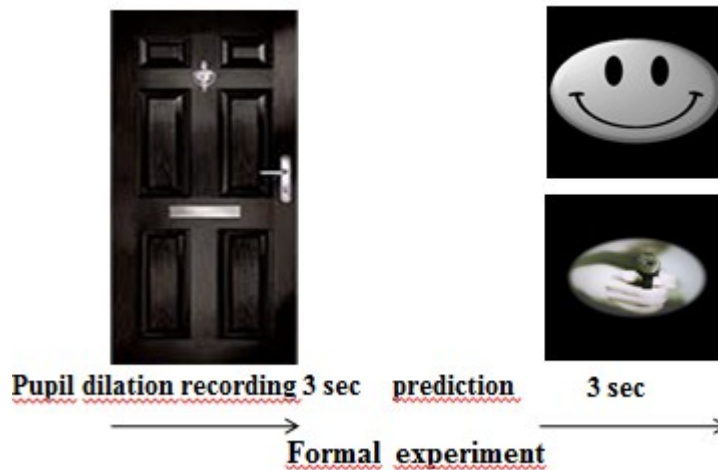


At the end of the IRR, the software will average the pupil dilation measures related to the shooting gun and the smile that will serve as templates to be compared with the averaged pupil dilation measured in the prediction phase in the formal experiment.

After the recording of the IRR, the formal experiment will start.

The research assistant instruction to each participant will be: “Now your task is to guess what you will see behind a closed door that will be presented in the center of the monitor. Behind the door you can see a gun shooting on you or a smile. The computer will monitor your pupil dilation and will guess for you what you will see. Remember that the choice of the shooting gun and the smile, is completely random and hence it is not possible to find an underline rule to predict their sequence. The task consists in two sessions of 10 trials each. For each correct hit you will gain 0.5 euros”.

The sequence of events is presented in Figure 1b.



In this case pupil dilation will be measured for 3 sec during the fixation of the door. Just after, the software will match the averaged pupil dilation with the two templates related to the shooting gun and the smile, recorded in the IRR. The smallest difference will be used to predict which of the two stimuli will appear. For example, if in the IRR, the averaged pupil dilation measures related to the shooting gun and the smile were 4.5 and 4 mm. respectively, and the averaged pupil dilation recorded during the fixation of the door was 4.4, the software will predict the shooting gun that will be skipped. On the contrary, the prediction of the smile, will allows its presentation

Software: the program controlling stimulus presentation, pupil measurement and automatic scoring and its connection with the eye tracker is developed in E-Prime™ v.2.0.

Eye-Tracker Apparatus: The eye-tracker model Tobii T120® has the following technical characteristics: data rate, 120 Hz; accuracy, 0.5 degrees; freedom of head movements, 30 × 22 × 30 cm; monitor, 17 inch; 1280 × 1024 pixels; automatic optimization of bright-dark pupil tracking.