1) Data collection. Have any data been collected for this study already?

No, no data have been collected for this study yet.

2) Hypotheses. What's the main question being asked or hypothesis being tested in this study?

1. Differences in acquisition between the disgust (DC group), fear (FC group) and mixed conditioning group (MC group):
   The acquisition strength (discrimination between CS+ and CS-) will be lower for the FC group than for the DC and MC group.
2. Differences in extinction between the DC, FC and MC group:
   The FC group will show better extinction learning (lower discrimination between CS+ and CS-) than the DC and MC group.
3. Differences in extinction retrieval between the DC, FC and MC group:
   The FC group will show better extinction retrieval (lower conditioned responses) than the DC and MC group.

3) Dependent variable. Describe the key dependent variable(s) specifying how they will be measured.

The conditioning measures will be obtained before, in the middle and after each conditioning phase (except for habituation and extinction retrieval).
CS Valence ratings ("How pleasant do you find this face?") will be obtained with visual analogue scales displayed on the computer screen. The anchor points range from 0 ("very pleasant") to 100 ("very unpleasant").
UCS expectancy ratings ("Do you think that this face is paired with an unpleasant picture?") will be obtained with visual analogue scales displayed on the computer screen. The anchor points range from 0 ("extremely unlikely") to 100 ("extremely likely").
Fear ratings ("The face evokes…") will be obtained with visual analogue scales displayed on the computer screen. The anchor points range from 0 ("no fear") to 100 ("a lot of fear").
Disgust ratings ("The face evokes…") will be obtained with visual analogue scales displayed on the computer screen. The anchor points range from 0 ("no disgust") to 100 ("a lot of disgust").

4) Conditions. How many and which conditions will participants be assigned to?

There will be three conditions: a disgust conditioning (DC group), a fear conditioning (FC group) and a mixed conditioning group (MC group). The DC group will receive an acquisition phase in which the reinforced conditioned stimulus (CS+) will be paired with disgust-evoking pictures. The FC group will receive an acquisition phase in which the CS+ will be paired with fear-evoking pictures. The MC group will receive an acquisition phase in which the CS+ will be paired with pictures that evoke fear and disgust at the same time. These pictures were chosen based on results of a pilot study. The rest of the study will be the same for all groups. Two neutral male faces from the Karolinska Directed Emotional Faces set (Lundqvist, Flykt, & Öhman, 1998) will serve as conditioned stimuli.

All groups will go through the following phases during the experiment:
Day 1:

- Filling out questionnaires (Intolerance of Uncertainty (Gerlach, Andor & Patzelt, 2008), Obsessive-Compulsive Inventory-Revised (OCI-R; Gönner et al., 2007), Depression, Anxiety and Stress Scale (DASS-21; Nilges & Essau, 2015) and Assessment of Disgust Sensitivity Questionnaire (Schienle et al., 2002))
- Habituation: 2 presentations of CS+ and CS- without reinforcement
- Acquisition: 14 presentations of CS+ and CS-; CS+ will be reinforced with the unpleasant unconditioned stimulus 9 times (UCS+) and the CS- with a neutral UCS- 9 times
- Contingency awareness check

Day 2:

- Extinction: 14 presentations of CS+ and CS- without reinforcement

Day 3:

- Extinction retrieval: 1 presentation of CS+ and CS- without reinforcement
- Memory test: 3 old UCS+ und UCS- and 2 new UCS+ und UCS- will be presented and then participants will be asked to determine which ones are new and which ones are old

5) Analyses. Specify exactly which analyses you will conduct to examine the main question/hypothesis.

To examine the differences between the groups during fear acquisition, extinction and extinction retrieval a mixed analysis of variance (ANOVA) for repeated measures will be conducted. Group (DC group vs. FC group vs. MC group) will be entered as between-subjects factor and CS type (CS+ vs CS-) and experimental phase (pre-acquisition, mid-acquisition, post-acquisition, pre-extinction, mid-extinction, post-extinction, extinction retrieval) as within-subject factor.

6) Outliers and Exclusions. Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

Participants will be excluded due to non-attendance on at least one of the three days and missing contingency awareness after acquisition.

7) Sample Size. How many observations will be collected or what will determine sample size?

An a priori calculation of statistical power (G*Power) suggests that the recruitment target should be 105 participants (35 participants per group) to achieve a medium effect size of 0.20, an alpha level of 0.05, and a statistical power of 0.95.

8) Other. Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

Dispositional measures obtained from the questionnaires, will be added as moderators to the analysis to explore their roles in conditioning.

9) Name. Give a title for this AsPredicted pre-registration

Exploring different Emotional Conditioning Paradigms in an Online Study

10) References

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