Pink noise exp, Jerusalem, March 2019 (#20988)

Author(s)
Nathalie klein Selle (The Hebrew University of Jerusalem & University of Würzburg) - nkleinselle@gmail.com
Yoni Pertzov (The Hebrew University of Jerusalem) - pertzov@gmail.com
Matthias Gamer (University of Würzburg) - matthias.gamer@uni-wuerzburg.de

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1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
The present study will use a modified directed forgetting paradigm to examine whether, and how, eye scanning patterns play a role in motivated memory. In order to examine this question, all participants will undergo two testing sessions, two/three days apart:
• In the first session, each trial will begin with the presentation of 1 of 90 colored scene-pictures (for 3000ms; i.e., memory encoding). Immediately after, participants will be presented with both an auditory message and visual cue (for 650ms) instructing them to: either due nothing (white fixation dot), forget (purple fixation dot) or remember (green fixation dot) the previously presented picture. Importantly, not more than 2 identical cues will appear consecutively. Immediately following the cue, a pink noise image will be presented (for 3000ms; i.e., memory control).
• In the second session, participants will receive a recognition memory test in which they will be presented with the 90 pictures from the study phase and 90 foils (each picture will be presented for 3000ms). Participants will be asked whether the presented item had been presented during the study phase. Importantly, they will be explicitly told to disregard the previous forget and remember instructions, and that all earlier presented stimuli, regardless of instructions, should be endorsed with yes. Participants will be given unlimited time to make their responses and accuracy will be encouraged by promising a monetary bonus if at least 75% of the answers are correct.
This specific design will enable the comparison of eye-gaze during initial memory encoding, subsequent memory control and final memory testing. As participants do not know in advance whether to remember or forget, the implemented control processes acted solely on the actual memory representation and not on initial memory encoding. Finally, at the end of both sessions, participants will receive a paper-and-pencil questionnaire in which they will be asked (1) to rate their motivation and efforts to remember/forget, and (2) to describe any methods used to forget/remember.

3) Describe the key dependent variable(s) specifying how they will be measured.
• Eye-movement pattern similarity (i.e., similarity of scanning patterns in the memory encoding, memory control, and memory test phases). The eye-movement data will be extracted and parceled using an Eyelink 1000 setup.
• Skin conductance responses (SCR; i.e., maximal increase in skin conductance in 1-5s after stimulus onset), will be measured using a biopac system.
• Recognition memory: button-press (g = yes; j = no)
• Reaction Time (RT) of button press in the memory test.

4) How many and which conditions will participants be assigned to?
There are three within-subject conditions: remember, control, and forget.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
• The eye-movement similarity data: will be analyzed using a 3 x 2 repeated measures ANOVA with experimental condition (remember, control, forget) and memory-performance (hits, misses) as within-subject factors. In case of a significant interaction, we will perform for each experimental condition a paired sample t-test, comparing the hits and misses. Importantly, these comparisons will be supplemented by Bayes Factors (BFs).
• SCRs during memory control and memory testing: will be analyzed using a 3 (Experimental condition) x 2 (Memory-performance) repeated measures ANOVA. Follow-up t-tests will be supplemented by BFs.
• Recognition memory data: will be analyzed using a repeated measures ANOVA, comparing the remember, control, and forget conditions.
• RT data: will be analyzed using a 3 (Experimental condition) x 2 (Memory-performance) repeated measures ANOVA. Follow-up t-tests will be supplemented by BFs.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
- Before the start of each experiment we will check the quality of skin conductance and eye tracking recordings. In case we detect a serious problem with either one of the measures, we will terminate the experiment at that point.
- Eye-tracking data: trials with less than 3 fixations will be discarded and participants that remain with less than 80% of their data will be disqualified.
- Skin conductance data: individual responses will be removed if excessive movements are made during the measurement window or if the response is an outlier (Z-score larger than 5 or smaller than -5).

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
A power analysis was conducted to determine how large the sample size needs to be to find a difference between the hits and misses. The analysis revealed that to obtain a statistical power of at least 0.80 for detecting a medium effect size (i.e., Cohen's d of 0.50), the sample size should be about 34.

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

• We will analyze the motivation-questionnaire data, which will be obtained at the end of the experiment, using paired sample t-tests (e.g., motivation to forget vs. motivation to remember).

• In addition to the eye-movement similarity analysis, we may also analyze other eye-tracking related measures such as fixation duration/fixation count.