AsPredicted Preregistration Template

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

- No, no data has been collected for this study yet.

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

In the repeated recording illusion (Anglada-Tort & Müllensiefen, 2017), participants listen to the same piece of music repeated three times. Many do not detect that the three musical excerpts were in fact the same piece.
We ask, how do working memory load and explicit information together affect the likelihood of participants believing they heard different pieces, when in fact they were always presented with the same excerpt.

In a between-subjects-design one group will perform a working memory load task while listening to the musical excerpts. Our first hypothesis is that the WM load group will fall more often for the illusion, as part of their working memory and attention is already focused on retaining unrelated information.

Hypothesis 1: Participants with WM load tasks fall more often for the illusion than without.

Our main focus is to collect data in the explicit information x WM load condition. If we are able to collect enough data (see 7, sample size) we plan to additionally investigate a Mere Exposure x WM load condition (neutral texts instead of priming). In that case another hypothesis in a between-subjects-design is that the Explicit Information x WM load group will fall more often for the illusion, than the Mere Exposure x WM load group.

Hypothesis 2: Explicit Information x WM load participants fall more often for the illusion than Mere Exposure x WM load participants.

In a within-subjects-design the Explicit Information group will listen to each musical excerpt once in a baseline condition without information, once with a low-, and once with a high prestige text beforehand. Our third hypothesis is that the musical excerpt in the high prestige condition will be liked better than the low prestige condition.

Hypothesis 3: The Explicit Information group will like the musical excerpt with a high prestige priming better than the musical excerpt with a low prestige priming.

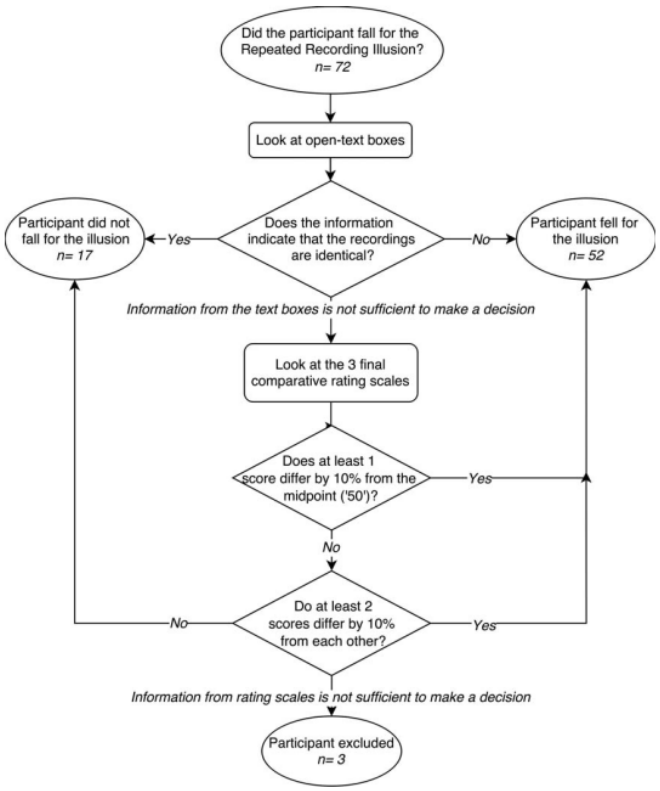
References

Anglada-Tort, M., & Müllensiefen, D. (2017). The repeated recording illusion: the effects of extrinsic and individual difference factors on musical judgments. *Music Perception: An Interdisciplinary Journal*, *35*(1), 94-117.

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

For our first and second hypothesis the dependent variable is the proportion of people who fall for the repeated recording illusion. We will determine whether a participant fell for the illusion or not, by evaluating the information from the open-text boxes and looking at the liking scales as described in the following illustration.

Decision Diagram of the Procedure used to Determine Whether Participants Fell for the Repeated Recording Illusion



For our third hypothesis the dependent variable is the overall liking of the audio stimulus. We will create a composite score of liking by computing the mean of the first 4 liking questions.

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

Participants will be divided into two groups, a control group and an experimental group (cognitive load task), but will be presented the same prestige stimuli and audio files.

Participants of the control group will perform two blocks, each block is built up by three rounds. One block contains a classical music piece (***Bruckner Symphony No. 4 ‘‘Die Romantische’’***), the other block a rock music song (***Devil in her Heart, The Beatles***). In one block the same audio file is played in both rounds. One group is performing the test with prestige stimuli input (high and low factored text), the other group is tested with a neutral stimuli input (two different neutral texts) for mere exposure conditions. The first trial of both

groups is a baseline condition, where only the music piece is presented and must be evaluated. The next two rounds include three steps, first a prestige or neutral stimuli input, secondly the presentation of the audio file and at the end an evaluation questionnaire of the presented audio file with a liking scale and open-answer box, to evaluate if they fall for the repeated illusion.

The experimental group is performing the same test as the control group but has to perform a working memory task during the trial. Participants will as well be divided into prestige and neutral condition group and must absolve two blocks of three rounds each. The first round is like the first round of the control group condition. Here, they must hold 8 consonants in memory and recall them after the evaluation. The next two rounds are built up by five steps. First, the digit maintenance task, where participants have to learn 8 randomly presented consonants and have to recall them in the last step. Secondly, they will be confronted with either prestige or neutral stimuli and in the next step listen to the audio file. The fourth step contains the same evaluation questionnaire as the control group. At the end they have to recall the information learned in step one, where they will be asked to name as many letters as possible that they can reproduce, best in the presented order.

At first, we will run the experiment with the prestige groups of the control and experimental group. When having enough participants in the prestige condition, we will measure the mere exposure effect with the neutral condition in the control and experimental group.
The different audio files (songs of classical and rock music), as well as the prestige or neutral stimuli inputs are counterbalanced over each personal trial to guarantee a fully randomized run of each participant.

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

We will aggregate participant's ratings on the four Likert rating scales into a single scale as a measurement of "liking".

Hypotheses 1 & 2: WM load and prestige suggestion should affect the frequency with which people fall for the repeated presentation illusion.
Analysis: Perform three Chi-square tests on frequency of positives (fell for it) + optionally: logistic regression model for detecting interactions

Outcome variable

a) frequency of positives (fell for illusion)

Dependent variables

1. WM load (between-subjects)
2. Prestige suggestions (within-subjects)
3. Musical genre (within-subjects)

Hypothesis 3: In the prestige suggestion group, we will observe higher aggregated liking scores after the high-prestige suggestion vs. after the low-prestige suggestion.
Analysis: We will run a linear mixed model for each music condition respectively.

Outcome variables

a) aggregated "liking" score

Dependent variables (fixed effects)

1. explicit information of text (low or high or no prestige text)
2. repeated exposure (first, second, or third position)
3. WM load (yes or no)

\+ *Participants as random effects.*

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

If information from the open-text boxes is not sufficient and/or too ambiguous to make a clear and objective decision, we will not include the participant's data in subsequent analysis for the repeated recording illusion.

We will exclude trials from the cognitive load condition in which less than 5 letters are recalled for the subsequent analysis. If this criterion is too strict, we will set the lower limit to a number of letters that is successfully recalled in 90% of trials.

7) Sample Size. 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.
We performed a power analysis based on the model R^2 values from Anglada-Tort & M-2017. We found that we would need 34 participants in the popular music condition, and 71 participants in the classical music condition, to detect an effect at alpha = 0.05 and power = 0.95. Given this and our timing and budget constraints (we cannot pay participants for their participation) we plan to:

Step 1: We will need at least 80 participants, who will all be assigned to the prestige condition and split into two groups: one group with WM load and one group with no WM load.

Step 2: When we succeed with Step 1, we continue recruiting new participants for the two mere exposure conditions until mid-January. Ideally, we would also recruit 80 participants for the mere exposure conditions, which would make 160 participants in total (N = 160).

8) Other. Anything else you would like to pre-register?

(e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

We will perform a principal component analysis on the aggregated scale of liking.

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

Suggestion: use the name of the project, followed by study description.

Everything is not like it sounds: The influence of cognitive load on the repeated presentation illusion

The general structure of our experiment is a 2 x 3 x 2 design. We will manipulate the following variables:

a) Cognitive load (between subjects, two steps: presence of load **or** no load)
b) Explicit information (within subjects, three steps: none, low prestige, high prestige)
c) Musical genre (within subjects, two steps: classical **or** pop music)

If we can recruit enough participants (*see Section 7*), we will add a second 2 x 3 x 2 design, in which manipulation of explicit information is changed compared to the first design.

a) Cognitive load (between subjects, two steps: presence of load **or** no load)
b) Explicit information (within subjects, three steps: none, neutral prestige 1, neutral prestige 2)
c) Musical genre (within subjects, two steps: classical **or** pop music)

Finally. For record keeping purposes, please tell us the type of study you are pre-registering.

- Class project or assignment
- Experiment

- **(https://aspredicted.org/create.php)**