**Project: Emotional Metamemory**

On 14 August 2019, the Danish Neuroscience Center Institutional Review Board (IRB) carefully reviewed and discussed the submitted material regarding your project “Emotional Metamemory”.

Before giving its final approval of the project, the IRB asks that a number of concerns are addressed, and that specific changes are made to the documents and project:

1. The IRB is concerned that the choice of primary language among the participants may confound the proposed experiments. The IRB worries that couplings between words and emotions are established and may be strongest ‘within’ the participants’ native language. Accordingly, differences in non-native English speakers’ language skills and intrinsic ‘strategies’ to elicit emotional responses via foreign language cues may introduce unwanted variability. Short of a translation and revalidation of the proposed test for Danish, the IRB therefore suggests that only native English speakers participate in the study when the validated, English test version is used.

We thank the committee for their extensive and constructive review of our project. We agree that the language issue is indeed a potential limitation of the study, however, for this exploratory bachelor project, exclusively recruitment of native English speakers is not an option.

However, to minimize the negative impact of this condition, we have now amended our protocol in the following ways:

1. We will try our best to recruit as many English native speakers as we can. We will only include participants who self-report having a very high level of fluency in English (i.e 10 or more years with daily exposure to English).
2. All subjects will now provide arousal and valence ratings of all included English stimuli in an at home-rating procedure, together with a financial incentive to complete the ratings (50 additional DKK). This will enable us to validate our stimulus categories, and also to perform control analyses comparing any obtained results when analyzing data based on the original arousal and valence classification, versus the actual ratings of our local participants.
3. As a positive control, we will analyze heart-rate variability and acceleration as markers of stimulus induced arousal. If this analysis shows no effect of stimulus arousal on cardiac response, then we will conclude that the manipulation of arousal was unsuccessful. This is itself an informative outcome for the project and consequent publication of results.

Together, we feel that these procedural amendments will help to ensure that this is not a fatal flaw of our study, but rather a useful starting point for future investigations.

2. The information under ‘Personal data’ about data storing is not clear. Participants need to know that data will be stored safely, in accordance with the stipulations in the General Data Protection Regulations and other relevant Danish legislation, not specifically how this is accomplished. Please ensure that the information in the participant information and the protocol are similar.

We updated this information.

3. The information for participants should be clarified:

Please state whether the tests take place right after the information session. In general, it is recommended that each participant is given time (at least a day) to consider whether he/she wants to participate

The recording of electrical signals for the purpose of heart rate variability calculations should be described to potential participants. The IRB welcomes an information package draft that might be used by other researchers/projects

If relevant, information on the handling of incidental findings needs to be stated. The electrical signals recorded from the heart in this study are not in any way suited for diagnostic purposes and will not be reviewed by a medical specialist. On rare occasions, experimenters may find abnormalities that they suspect might warrant medical attention. In such cases, the subject agrees to such sharing of his/her data with the medical professional(s), and to being contacted in case a medical professional asserts that further examination could have significant health benefits for the subject.

Please state that participants will be “compensated” for their participation in the study. This compensation should not be mentioned in the context of a “salary”. Accordingly, the compensation must be stated as a total amount, not as pay per hour.

Under ‘type of personal data and when it is deleted/anonymized’ the last sentence must be changed to ‘We store your personal and general demo- graphic information until the end of the data collection, after which data will be anonymized’.

The information for participants encourage them to read the Scientific Ethics Committee’s information. Include a link to this information \*

\*We are now describing their rights in the text and we will also include a printed version of the rights of participants.

Information about AU’s DPO should be included.

Dr Micah Allen should be listed as PI under Contact Person.

           We updated all the items from list #3

4. The protocol needs to state

In the section “Main hypothesis” the authors describe that the significance of the null hypothesis will be assessed using Bayes factor analysis (BFA), which, with n=35, sounds plausible and reasonable. However, the approach used for BFA or any other Bayesian analysis is not described in the section “Data analysis”. A short description, or simply renaming the “hierarchical linear model” to “Bayesian hierarchical linear model” if this approach will be used, would benefit the scientific evaluation of the application. Furthermore, the choice and motivation of priors used in the BFA should be mentioned and motivated.

**Testing Hypothesis**

Our primary analyses will consist of 2x2 Repeated Measures ANOVAs on d’, m-ratio, average confidence, and reaction time. These will be conducted in JASP using frequentist statistical tests, alpha level = 0.95. Additionally, we will split trials into correct vs incorrect trials and estimate a 2 (valence) by 2 (arousal) by 2 (correct/error) ANOVA on average confidence ratings. In the case of any non-significant (i.e., null) effects we will re-run these tests using the equivalent Bayesian test under the default Cauchy prior = 0.707 in order to assess the evidence for the null hypothesis.

**Choice and motivation for priors**

The choice and motivation for priors used in the BFA are based on the default prior settings recommended by the authors of JASP and the underlying statistical packages in R (e.g., E.J. Wagenmakers and Richard Morey). These are justified as delivering an optimal tradeoff between type 1 and type 2 errors; in particular in exploratory studies such as ours in which there is no available prior information about effect sizes. These tests will thus deliver a conservative estimate of the evidence for the null, relative to the alternative model specified by our design.

For references, please see here <https://link.springer.com/article/10.3758/PBR.16.2.225> and here <https://psyarxiv.com/yqxfr>

This information has been added to the Scientific Protocol document.

Information on data acquisition is missing.

We added the data acquisition description.

Information on ECG or other electrical recordings for heart rate variability must be stated in the protocol

We updated the information for acquiring heart rate variability with the pulse oximeter.

Thanks to the committee for your time and consideration of our project.