Review of registered report: "Changes in memory function in adults following SARS-CoV-2 infection: findings from the Covid and Cognition online study" by Josefina Weinerova et al.

Dipanjan Ray

Ashoka University, India

I am pleased to provide my review of the registered report submitted for consideration. Overall, this report presents a well-executed study, marked by several strengths and contributions to the field. While the report has several noteworthy merits, there are also a few caveats that warrant careful consideration and potential refinement. In the following review, I will discuss both the strengths and limitations of the report, offering constructive feedback to help enhance its overall quality and impact.

The research question is scientifically valid, addressing a timely and relevant issue. The study seeks to explore (i) the impact of SARS-CoV-2 infection on memory function, (ii) potential variations in this effect concerning memory type (item vs. associative) and stimulus type (verbal vs. pictorial), and (iii) whether these effects are moderated by vaccination status. These inquiries are firmly rooted in current scientific concerns and draw from an existing body of evidence.

The hypotheses put forth in the report are logical and plausible, with clear connections to existing literature. The distinctions between item and associative memory, as well as verbal and pictorial stimuli, are well-founded in the realms of cognitive psychology and neuroscience research. The hypotheses are articulated precisely and flow directly from the research questions.

The design is straightforward, the analysis plans seemed appropriate. The statistical power analysis supports the feasibility of the sampling plan. The inclusion of Bayesian ANCOVA with uniform priors is particularly noteworthy for its transparency and ability to quantify evidence for the null hypothesis. The methodological information provided is adequate for replication, offering clear group definitions as well as concise descriptions of cognitive tasks and analysis plans.

My primary concern revolves around participants potentially encountering difficulties when accurately recalling specific details. These details encompass the timing of their last vaccine dose, the type of vaccine received for each dose, whether they tested positive in a Rapid (Lateral Flow) or PCR test, and the

timing of any confirmed COVID-19 diagnosis in relation to their vaccination history. This task becomes even more challenging considering that COVID-19 has been demonstrated to impact memory function, which is the focus of the current study.

To address this issue, I propose two strategies, either of which the authors can consider implementing to partially mitigate this challenge:

1. Confidence Rating: Alongside each question, incorporate a confidence scale. After participants provide their response, ask them to rate their confidence in their answer using a scale, (such as 1 to 5 or 1 to 7), with 1 representing "not confident at all" and the highest number indicating "very confident." This approach allows for the identification of responses where participants may lack confidence, highlighting potential areas of uncertainty.

2. "I Don't Know" Option: Introduce a response option that allows participants to select "I don't know" or "unsure". This enables participants to acknowledge when they are uncertain about an answer rather than making guesses, enhancing the accuracy of the data collected.

Nevertheless, it appears that the majority of the data has already been gathered, with 421 out of the expected 450 subjects collected. Given this situation, there may be limited room for revisions, and I am uncertain if this goes against the original intent of a preregistered report. I would like to request clarification from the he recommender.

If feasible, I suggest including a "confidence rating" or "I don't know" options for new subjects. This could provide a preliminary understanding of how the aforementioned issue might impact the interpretation.

Furthermore, the absence of inquiries about participants' memory competence prior to the COVID-19 pandemic represents a potential limitation in this study. This information would have served as a valuable reference point. Without this baseline data, it becomes difficult to ascertain whether other pre-existing factors that cannot be captured based solely on age, education level, or medical history might be influencing any detected variations in memory performance.

In summary, this registered report presents a well-structured study with clear and replicable procedures. It effectively addresses a significant research question, supported by a logical and well-founded hypothesis. The analysis pipeline is robust, incorporating appropriate statistical considerations. Nevertheless, it is important to acknowledge certain caveats, such as the absence of a test for the reliability of participants' memory or the lack of baseline memory competence data, as previously mentioned.