

## Peer-review comments and authors' responses

### Reviewer 1

#### 1. METHODS:

- a) *Manuscript pg. 6 'Participants': Since they are full time college students, the standard deviation in age was not high. But I would suggest you to establish a maximum age since it can be a confounder.*

Respectfully, we are not clear on this comment. As stated in the paper, our inclusion criteria for the pilot study included '...18 years of age and older.' It is not possible at this time to change the inclusion criteria, as this pilot study has been completed. Perhaps addressing the intention of this comment and related to a comment by Reviewer 3, text has been added to the Study Limitations section on pg. 14 regarding the limited age range of the study participants and the importance of addressing this in continued research.

- b) *Manuscript pg. 6 'Participants': Additionally to this, it's important to consider other factors that may be exclusion criteria or controlled in your statistical analysis, since they are possible sources of bias: medications in use, sleep issues, alcohol / substance use, etc.*

Thank you for this valuable feedback. This feedback has been incorporated into the Study Limitations section (pg. 14).

- c) *Manuscript pg. 6 'Procedures/Experimental Tasks': The order of the presentation of the activity it's an important factor to consider since it can impact the performance of the subject in the task. Additionally it's not clear if the participant knows or not in advance which activities he will perform.*

We wholeheartedly agree that order of activity presentation is important, which is why we randomized the order of the activities across participants as stated in this section of the paper. Text has been added to clarify that participants did not know in advance what the activities were (pgs. 5-6).

- d) *manuscript pg. 8 'Statistical Analysis': It was not clear for me which measures you are considering "at rest". It is the pre and post activities? If is, it should be more clear. But it can lead to bias, since before the task the participant can be more tense and anxious.*

Thank you for this comment. We have clarified on pg. 5 in the manuscript what we meant by the ‘*at rest*’ condition in this study and that the ‘*at-rest*’ condition analyzed was the pre-activities one (pg. 8). Also, in Discussion on pg. 12, we have added text acknowledging the possibility that participants may have been more tense/anxious at the start of the study, when we ran the ‘*at-rest*’ condition, thereby biasing the validity of that EEG data.

## 2. DISCUSSION:

a) *Manuscript pg. 11 ‘Cortical Stimulation Associated with Tabletop Cognitive Activities’: Indeed, in these “passive” tasks, other brain regions play a more important role. So the nature of the activity is an important issue to consider in your analysis. Generally, tasks that involve problem-solving are considered more cognitively demanding since they require a greater participation of PFC. It’s a suggestion to consider this in your reasoning and mention some references to it.*

Thank you for reinforcing this point. We have re-worded the text on pg. 11 to more clearly make this point than we did originally, with the four original references we cited unchanged.

b) *Manuscript pg. 11 ‘Cortical Stimulation Associated with Tabletop Cognitive Activities’: It’s not that they aren’t stimulating. You cannot forget you are assessing health subjects in your study. Generally, even these “easy” tasks can be cognitively demanding for patients who suffer from some kind of brain impairment. The connectivity and activation may be different in these patients. So, doing this affirmation is a little bit dangerous, especially without any reference to sustain it.*

Thank you. In response to this excellent point, we have re-worked the text on pg. 11 and added a supporting reference.

c) *Manuscript pg. 12 ‘Self-Perceived Challenge of Tabletop Cognitive Activities and LDLPFC Activation’: As I mentioned before, it’s important to explain what you are considering “at rest” since the periods before and after the activity can generate different patterns of function. Additionally, I suggest you explain why you think, in your study, the participants utilized their PFC during “at rest”, providing possible reasoning for that that may be linked with your experiment.*

Thank you again for this comment. We have added text in this Discussion sub-section (pg. 12) acknowledging the possibility that participants may have been more tense/anxious at the start of the study, when we ran the ‘*at-rest*’ condition, thereby biasing the validity of that EEG data.

*d) Discuss the potential impact of the gender imbalance in the sample and consider including more male participants in future studies.*

Thank you. We have added text regarding this important point in the ‘Study Limitations’ Discussion sub-section (pg. 14).

*e) Provide a more comprehensive explanation of how missing data were handled and its potential impact on the study’s findings.*

Thank you. We have added some text to the ‘EEG Cleaning and Missing Data’ section of Materials and Methods (pg. 8), including a more elaborated reference on this page to our Manuscript Supplement document which comprehensively details how missing data were handled. Text in the ‘Study Limitations’ section of Discussion discusses newly added potential strategies to control for EEG artifacts/missing data (pg. 15).

*f) Expand the discussion on the broader implications of the findings for cognitive health interventions and long-term brain health.*

Thank you for this feedback. We have added text expanding the implications of study findings to broader applications in cognitive health interventions and long-term brain health (pg. 14) and added a supporting reference.

### 3. CONCLUSION:

*The conclusion should provide clearer recommendations for future research, including suggestions for larger and more diverse samples, alternative experimental designs, and potential modifications to the chosen cognitive activities to better capture a range of cognitive challenges.*

Thank you for this point. The added text that you have suggested nicely concludes the paper (pg. 15 and pg. 16).

*In addition to my comments above and in the attached revised version of the original file, I would like to share some reflections on the study. As this is a pilot study, I believe there are several points that may benefit from further consideration. The following orientations may prove beneficial for the comprehensive completion of your research...*

THANK YOU for taking the time to share your reflections – we greatly appreciate your kindness doing so. These will greatly benefit the quality of our ongoing research.

## Reviewer 2

### 1. METHODS:

- a) *Regarding the recruitment and inclusion criteria, adding different levels of education would enhance the generalizability of your study, as the sample of your study represents a small portion of the population. For that, I would suggest that subjects with other levels of education be added to your sample or acknowledged in the manuscript.*

Thank you for this feedback. We have added text that speaks to recruitment and inclusion criteria in this study being a study limitation on pg. 14.

- b) *With Friedman's test, I'm used to seeing the results of the omnibus test indicating a difference among the groups, followed by the Wilcoxon test with correction of family-wise error rate for multiple comparisons. In the manuscript, it wasn't clear to me how this was accomplished.*

Thank you for this comment. You are correct that the omnibus test was first performed and, when an overall difference among groups was identified, the Wilcoxon test followed to explore pairwise comparisons. No corrections for multiple comparisons were made as this is an exploratory/hypothesis generating study. We clarified this in the Statistical analysis section of the manuscript (pgs. 7-8) and edited Tables 3 and 4 to make this evident.

### 2. TABLES:

*I suggest that tables be sent in a different format, as some values were cut off the file that was sent.*

The tables have been re-formatted.

3. *GRAMMAR & TYPO: Two typographical errors (p1, line 2 'that that'/missing parenthesis after Wilson, 2003 in the first paragraph).*

Thank you for seeing these typos, which have been fixed (pg. 3).

Dear Reviewers

Thank you for your thoughtful and helpful feedback regarding our manuscript. Kindly see our response to each of your comments below. We believe that we have responded to all suggestions and that the paper is improved because of your feedback.

Dr. Felipe Fregni, Editor-in-Chief  
*Principles and Practice of Clinical Research*  
September 17, 2024

Dear Dr., Fregni,

Here is our manuscript revision based on reviewer feedback regarding “Cortical Activation During Tabletop Cognitive Activities and the Influence of Self-Perceived Challenge as measured by Electroencephalography: A Pilot Study,” for possible publication in *Principles and Practice of Clinical Research*.

We appreciate the reviewers’ feedback regarding our manuscript. Beginning on the next page, please find a summary of all of the reviewers comments and our responses to them.

We hope that you will find our revised manuscript acceptable for publication.

Thank you in advance for your consideration,

*Therese M. O’Neil-Pirozzi,*

Corresponding Author

