Author’s response to reviews

Title: Virtual Reality among the Elderly: a Usefulness and Acceptance Study from Taiwan

Authors:
Shabbir Syed-Abdul (drshabbir@tmu.edu.tw)
Shwetambara Malwade (sv14kekade@gmail.com)
Aldilas Achmad Nursetyo (mail.aldilas@gmail.com)
Mishika Sood (mishikas@gmail.com)
Madhu Bhatia (bhatia.madhu23@gmail.com)
Diana Barsasella (diana.barsasella5@gmail.com)
Megan Liu (fangliu@tmu.edu.tw)
Chia-Chi Chang (cchang@tmu.edu.tw)
Kathiravan Srinivasan (kathiravan.srinivasan@vit.ac.in)
Raja M (raja.m@vit.ac.in)
Yu-Chuan (Jack) Li (jaak88@gmail.com)

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Author’s response to reviews:

We are thankful to all the reviewers for the review of our manuscript and appreciate all your comments and suggestions. We have modified the manuscript as per your feedback as below.

Reviewer 1
Mario Ulises Pérez-Zepeda, M.D., M.Sc. (Reviewer 1): The manuscript improved. The authors included my suggestions. I still have some minor concerns.
1. English is much better, however there are still some minor issues with the manuscript that a final revision could arrange.
   • Thank you for all of the suggestions. We made more changes to the manuscript and also had it checked by a professional English editing service.
2. Please check the use of abbreviations and the time they are defined for the first time (or not defined, as PI). Even that a list of abbreviations is now included, the text needs to have them defined whenever they appear for the first time.
  • Thank you for the feedback. We re-checked this aspect and defined all abbreviations when they appear for the first time.

3. Figure 1 needs a more informative caption.
  • We changed the caption of Figure 1 to: “Research model for the study, with hypothesized relations among the variables.”

4. Please do not interpret in the results section (things like 'a good cronbachs alpha...'), leave interpretations for the discussion section.
  • Thank you for the suggestion. We shifted all interpretation to the "Discussion" section.

5. Discussion is still outreaching. For example: how can these results show the need to alert family, caregivers etc? This is clearly out of the scope of the manuscript.
  • Thank you for the suggestions. We modified the "Discussion" section to better fit within the scope of the manuscript.

Reviewer 2

Jason Fanning (Reviewer 2): The authors have submitted a revised manuscript describing older adults' perceptions of virtual reality across several dimensions of the TAM.

General Comments

1. The revised manuscript remains formatted in a very odd way, and requires substantial revision for grammar, spelling, and structure. The authors would be well-served by reading other literature in the area to get an idea for appropriate structure. In future submissions, it would be advisable to avoid submitting a tracked changes copy, instead highlighting relevant new additions, as it was very difficult to read this copy. And lastly, the authors should proofread the new content for clarity, spelling, and grammar.
  • We sincerely apologize for the inconvenience caused by the use of the "track changes" function. We made further revisions to the manuscript in red font and used strikethrough where needed, in order to highlight the changes. We also numbered each section to improve the structure of the manuscript.
  • We had the paper checked by a professional English editing service for clarity, spelling, and grammar.

2. The health promotion perspective sets the reader on the wrong path. Virtual reality applications designed to enhance cognitive functioning or physical activity will have a specific form and function, and will require lengthy engagement on most days of the week. The older adults in this study interacted with apps that are primarily for low-intensity entertainment purposes (e.g., passively viewing an Everest climb) or for education (arguably Google Earth VR, The Body VR). They were asked to interact with these apps in a fairly low-contact fashion (30 total weekly minutes), and seemingly could choose any of the apps to interact with. Because of this design, there is no reason to assume that the results would apply to VR applications capable of producing health effects and undertaken at sufficient frequency and intensity to achieve benefit - this is a fundamentally different use that will produce a very different experience for the older adult user.
  • We agree with your comments. However, for the actual purpose of the study, we were more interested in exploring the acceptability of VR (which is a newly emerging technology) among an older population and their perceptions of its use for health purposes.
This was a pilot study and was intended to provide an opportunity for older adults to begin using VR, by providing entertainment through minimal engagement, and motivate physical activity. For instance, each of our VR applications encouraged some kind of movement in some way, such as:

- high-intensity movement: engaging in some sport (Apps: Sparc, Final Soccer VR);
- low-intensity movement: climbing Mount Everest (Everest VR), moving with super human abilities (To the Top), walking around in nature (Found), or exploring a place (Google Earth);
- very-low-intensity movement: acting like a magician (Walt of the Wizard) and exploring the body cells (Body VR).

There were varied movement intensity apps, considering the age group and the level of activities they could sustain. Although the older adults were allowed to choose the app of their choice at every visit, we ensured that during the course of 6 weeks, they chose each app at least once.

3. The analyses are poorly described, and do not address the hypotheses. For instance, many of the hypotheses suggest mediation, but simple linear regressions were conducted. Whether relevant assumptions were checked for each analysis is unclear.

The authors note that means were used in regressions, but the meaning of this statement is not clear. The full factor analysis table is not presented, so it is hard to investigate potential cross loadings or better fit across other factors.

- Thank you for these suggestions. We conducted a mediation analysis, and included the modified analysis in Table 5 and the models in Figure 3. We also included a summary of the statistics, giving the means and standard deviations of the responses in Table 2.

- With regards to the factor analysis, we changed the method of analysis to criterion validity using Pearson's product-moment correlations. The results are shown in Table 3.

4. The results are very challenging to follow given the authors provided only tracked changes, and as a result there are many extra figures and tables. The regression analyses are reported in a very odd fashion, and it is unclear how the models are constructed. They appear to be simple single-predictor regressions, in which case they are equivalent to the correlations presented in the last submission.

- We apologize for the issues caused by the "track changes" function. The current version of the manuscript has the newly added tables in red font, and the ones that were removed are marked with strikethrough. We have added models from the mediation analysis to Figure 3. We also modified the linear regression in table 4, and report more details with regards to the same.

5. Lastly, the discussion makes some fairly broad claims given the data presented. For instance, "there were no negative opinions in the use of VR" is written, despite negative questionnaire responses. The simple analyses single time point analyses cannot be used to say one factor influences another, and much of the potential information is lost without proper mediation analyses. As such, the authors might say that user experience is related to intention to use VR, but it is not clear what such a statement would add to the literature.

- Thank you for the feedback. With regards to “no negative opinions”, we meant that in the qualitative interviews with the respondents, they gave no negative views about VR. However, we removed the sentences about “negative opinions” to avoid any further confusion.

- As suggested, we conducted a mediation analysis, and the results are shown in Table 5 and Figure 3. We modified the "Discussion" section to better fit the scope of the manuscript.