**PCS**                                                           **IMWUT**

IMWUT 2019 August 2019

# Review of 8897 - *"Predicting participant compliance in a large longitudinal study"*

## Reviewer 3 (Reviewer)

### Contribution to IMWUT

This paper uses a large real-world dataset to build predictors of engagement (self-report adherence and wearable device use). The dataset and the results of this paper are very interesting. Engagement is also a pressing problem for digital health, and I am not aware of any other studies that used a large enough dataset to study engagement as this paper did.

I argue for a minor revision of the paper and I describe the reasons for the minor revision below.

### Impact

Significant impact

### Review

I argue for a minor revision of this paper because it is already in quite a good shape. However, the paper needs a better description of the collected dataset, the use of only baseline covariates (there is no longitudinal analysis in this paper even though the data is longitudinal), the exploratory nature of the analysis (i.e., p-valures are not confirmatory). There is some minor writing issue as well, which I describe below:

1. At the end of page 3 and at the start of page 4, the paper talks about compliance. It is not clear how often reminder prompts were sent when people are non-compliant. Also, why consistently non-compliant people are excluded from the study. The analysis should adjust people that are not-compliant and treat them as people are non-respondent. Furthermore, reminder prompts change how compliance is influenced. The author needs to clearly specify what was the protocol for reminder prompts (what are criteria for "missing recent data" or "cumulative non-compliance").

2. The paper only uses the aggregate number of self-reports or wearable adherence as an outcome. While this is fine, the author did not do a longitudinal analysis of data. A longitudinal analysis would consider each day of non-adherence as 0 and adherence as 1. This type of longitudinal analysis with a binary outcome would make the analysis very interesting for mobile health---because we can then know how adherence changes over time and by context so that we can give just-in-time intervention. Currently, the authors only use baseline variables---which is not bad, but the authors can discuss longitudinal analysis as future work.

3. The statistical analysis is exploratory in nature. i.e., this paper is not a confirmatory analysis that uses pre-defined hypothesis. Acknowledging the exploratory nature would make the reader read the p-values differently.

Specific comments:
4. Fig 1, x-axis has no label. I do not know what 0 or 1 means. Why does 1(a) and 1(d) have different number of bars? What is the difference between 1(b) and 1(c)?
5. The graphs 3-6 can be removed. The aggregate information is not meaningful unless it is related to adherence.
6. The surveys are every two weeks and they take nearly 90 minutes to complete. Are these surveys financially compensated? Also, bi-weekly surveys are not similar to EMAs or daily self-reports that are commonly used in mHealth. So, the author should acknowledge that as a limitation, and their results do not generally apply to adherence in mHealth (e.g.,EMAs).
7. Section 5.4 is very well-written. It would be great to highlight the variables in table 4 that are significant.
8. In table 4, several features were significant. However, age, personality, cognitive ability, "born in the US" are not changeable. So, it would be great to hear authors' thoughts what are design the implications of the statistical significance they are reporting. I believe the authors should give "design implications" a try at least since they are the experts on why the variables are included and they may know what interventions may be more applicable for low conscientiousness people.

## Recommendation(s) to 1AE

Acceptable with minor (or no) changes

## Major / minor revisions (recommendation to 1AE)

Please see the comments above.

**Confidence**

Very confident - I am knowledgeable in the area

**Confidential Comments (Optional)**

I think this paper is great. But, the writing is not polished and the paper seems to be written at a rush in the last minute.

I did not give this paper a major revision because this paper by no means should be rejected. But, it can't be accepted at its current condition of writing.