Reviewer’s report

Title: Concurrent validity of the Fitbit for assessing sedentary behavior and moderate-to-vigorous physical activity

Version: 1 Date: 30 Oct 2018

Reviewer: Dane Domelen

Reviewer's report:

- The equivalence testing is unclear to me. Typically in equivalence testing the null hypothesis is that the effect (in this case, difference in mean sedentary time based on Fitbit and GT3X+) is outside of some range, like 30 min/day, and the alternative hypothesis is that it is within that range. But it appears that you are basing it on a percentage of the GT3X+ mean, or 10% of 600.4 which is 60.04. That seems like a large range. Anyway, it would be helpful to give a little more detail on what exactly you are testing, and also how to interpret Figure 2. Does the entire interval for Fitbit have to fall inside interval for GT3X+ to reject the null? Also, I am not sure whether "significantly equivalent" is the right phrase.

- Pearson correlation does not require normality, so I am not sure you necessarily had to exclude the 2 outliers. But if you wish to exclude the 2 observations, it should be briefly explained in the manuscript.

- Abstract. Why only report the $r = .65$, $\rho = .69$ correlation for MVPA? A range covering all 3 may be more appropriate.

- Abstract. Meaning of +/- should be given, e.g. age: $M = 47$ years, $SD = 14$ years.

- Abstract. Suggest changing "...was estimated using three different cut-points..." to "...were estimated using various cut-points..." to avoid implying that 3 cut-points were also used for SED.

- P. 4, lines 17-18. Why not state the cut-points here?

- P. 5, line 5. This is a very long paragraph; suggest breaking it up.

- P. 6, lines 12-14. Again, you mention three cut-points, but really use one for SED and three for MVPA.

- P. 6, line 17. Should be convenience sample.
- P. 7. Should be consistent in usage of g vs. grams and hz vs. Hz.

- P. 7, line 18. Should say "...were instructed to simultaneously..." since some non-compliance is expected.

- P. 8, line 1. Should be something like "...which is a standard placement site..."

- P. 8, line 5. Should be e.g. not i.e.

- P. 8, line 7. Would not say it was downloaded immediately.


- P. 9, line 16. Isn't there only 1 cut-point for SED?

- P. 9, line 19. I would replace "to determine measurement errors" with "to assess similarity".

- P. 9, line 23. Systematic bias usually refers to the mean being wrong, not to two measurement methods having different variances.

- P. 11, line 5. Either say "all P < .01" or maybe omit p-value here since it is given in the table.

- P. 11, line 6. Should be "one-way repeated measures ANOVA" to be more precise.

- For confidence intervals, I would suggest a different notation to avoid confusion between negatives and dashes. In Table 4, I think -74.05, -2.40 would be easier to interpret.

- P. 11, line 13. I think you need to be more precise with terminology. Pitman's test is for whether the variance of Fitbit and GT3X+ measurements are the same. I don't think it can be interpreted as having anything to do with random bias (do you mean random error?) or systematic bias.

- P. 12, line 11. Again, it is confusing to talk about 3 cut-points for SED, when it is really just 1 cut-point of 100.

- P. 12, line 17. "Nearly an hour or more" should be reworded.

- P. 12, line 22. Should be "strong correlations".

- P. 12, line 23. Confusing to say "latter study" when citation hasn't been given yet.
- P. 13, line 3. No need for comma after et al.

- P. 13, line 20. Not sure what you mean by "...and SED differences were not significantly biased by the total amount of daily SED."

- P. 15, line 20. Need citation for "more popular than hip worn models".

- P. 16, line 1. I think it is too strong of a statement to say that using 3 cut-points makes your results "not confounded by cut-point criteria non-equivalency."

- P. 16, line 18. Again, not sure about the "significantly equivalent" phrase, and also I think that some readers might view a 37 min/day difference as non-negligible.

- Table 1. Footnote still refers to p-value.

- Table 2. I don't think you need the last footnote, but up to you/journal.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

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I am able to assess the statistics

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