Author’s response to reviews

Title: Handgrip Force Steadiness in young and older adults: A Reproducibility Study

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Author’s response to reviews:

Manuscript: BMSD-D-17-01189R2 entitled “Handgrip Force Steadiness in young and older adults: A Reproducibility Study”

Dear Charlotte Beaudart,

We greatly appreciate the review of our revised manuscript.

Below please find the reviewer’s comments followed by our point-by-point response and further adjustments.

Yours sincerely,

Eling de Bruin
Response to reviewer #3 (Olivier Bruyère):

“1. If the validity of the apparatus has previously been confirmed, it should be clearly stated in the manuscript and the authors must provide appropriate references.”

We agree that all appropriate references should be provided. The sentence in the introduction paragraph now reads: “The WBB has previously shown promising results as a valid instrument for the accurate assessment of force32, balance33–35, reaction time36, isometric handgrip strength37 and whole isometric lower limb strength38,39.” (page 4, line 19-21). Reference 32 has been added to the reference list.

“2. The discussion regarding the percentage of MVC must be included both in the methodology and in the discussion sections.”

The rationale for choosing 5, 10 and 25% of MVC are mentioned in the methodology section and are now further elaborated on in the discussions section: “This concurs with the finding that force steadiness at lower force levels varies the most with respect to age, sex and neurological disorders3,15,42. For a given method, the more heterogeneous a sample is with respect to the measurement under investigation, the more reliable (i.e. higher ICC) the method becomes since it is less likely that the individuals change rank with repeated tests. Moreover, high force levels (e.g. 50% of MVC) requires more muscle strength endurance to maintain target force, and we risk testing strength endurance rather than the accuracy of force production with durations of 20 seconds or more, which is likely necessary to accurately assess force steadiness.” (page 10, line 17-25)

“3. The fact that the FysioMeter software has a cost must be highlighted in the manuscript.”
We agree with the reviewer on this point. The relevant sentence now reads: “The WBB is a relatively cheap, widely available and portable device, and the FysioMeter software is accessible for purchase to support the instrument.” (page 13, line 19-21)

“4. The authors seem to agree with the reviewer regarding the relevance of their results for epidemiological studies and also pointed out that extra work is needed to assess the utility for clinical setting. This point must be highlighted both in the abstract and in the full manuscript.”

This point has now been emphasised in the full manuscript, “More research is needed to investigate its utility in the clinical setting, and to understand and characterize how handgrip steadiness is related to age, handedness and over repeated assessments.” (page 14, line 7-9) and in the abstract, “More research is needed to assess their utility in the clinical setting.” (page 2, line 26-27)

“5. There are some interesting discussions in the response to reviewer section that, unfortunately, are not present in the full manuscript. The authors must have in mind that all reviewers’ comments are probably the comments of most of the readers and that some points of discussion the authors had with the reviewers could be part of the manuscript, for example in the discussion section.”

We fully agree and hope the changes added to our manuscript reflect the reviewers’ comments. Changes include the added definition of reproducibility, clarified the objectives, added references for the validity of the instrument, elaborated on our rationale for choosing 5, 10 and 25% of MVC, added information regarding the SRD measure and discussed the likely relevance of visual feedback on force steadiness measures. We have now also added points from our discussion with the reviewer regarding the Area measure in the discussion section: “The Area measure, on the other hand, is an approximated measure of the absolute deviation between target
force and force produced, independent of the standard deviation and the mean force produced. However, the reliability and agreement of the Area measure using the WBB was poor and thus found not to be a recommendable measure.” (page 11, line 17-19).