Please find enclosed our reply to the reviewers’ comments and a revised version of our manuscript.  We would like to thank the reviewers for their valuable comments. We have made all the changes requested to clarify and improve our manuscript according to the reviewers’ comments.

 We are confident that this revised version is suitable for publication in JOVE.

 Best regards,

Julie Nantel and Christopher Dalton.

**COMMENTS:**

-Short abstract – Please use complete sentences.

Complete sentences are now used throughout short abstract.

-Please copyedit the long abstract for typos. Also, please use complete sentences.

Edited and complete sentences are now used throughout the long abstract.

-2.1.1 – Please delete “3)”

This has been deleted.  
  
•Formatting:  
-Please make sure all steps are sequential. For instance, 3.2.2 is repeated.

The sequence for all of the steps has been double checked.

-Please bold all figure titles.

Figure 1 and Figure 2 titles have been bolded.

-References – Please abbreviate all journal titles.

All journal titles in the reference list have been abbreviated.  
  
•Additional detail is required:  
-3.2.2 – Are the sensors the same as the IMUs?

Yes they are the same. To avoid confusion, we have removed the term IMU and solely refer to them as ‘sensors’.

How is recording started or synchronized?

This has been added to section 3.2.4.

How are sensors attached?

This has been added to the MS. They are attached using adjustable Velcro straps.

-3.3 – How is the force plate calibrated here?

Once linked to the system, the operator must ensure that they are zeroed to be calibrated properly. This was added to the MS.

-3.3.1 – Please provide step-wise instruction for each calibration type if this is to be filmed. Otherwise, provide a citation.

We have added simple instructions

-3.3.2 – Which landmarks? How are markers attached?

The landmarks and therefore, positions of the sesnsors have been added to the MS. Also, they are attached using double sided-tape has been added as well.

-Table 1 – What do crosses and asterisks represent?

Indicated that they represent the p<0.01 and p<0.05 significance levels in comparing WP to NP.

-Figures – Please indicate in the legend what the asterisks and arrows indicate.

Indicated this within the ‘Figure Legends’ section.

•If your figures and tables are original and not published previously, please ignore this comment. For figures and tables that have been published before, please include phrases such as “Re-print with permission from (reference#)” or “Modified from..” etc. And please send a copy of the re-print permission for JoVE’s record keeping purposes.

Not published previously.  
  
\* JoVE reference format requires that DOIs are included, when available, for all references listed in the article. This is helpful for readers to locate the included references and obtain more information. Please note that often DOIs are not listed with PubMed abstracts and as such, may not be properly included when citing directly from PubMed. In these cases, please manually include DOIs in reference information.

DOIs have been added for all journal articles that have a DOI number.

***NOTE: Please copyedit the entire manuscript for any grammatical errors you may find. This editing should be performed by a native English speaker (or professional copyediting services) and is essential for clarity of the protocol. Please thoroughly review the language and grammar of your article text prior to resubmission. Your JoVE editor will not copy-edit your manuscript and any errors in your submitted revision may be present in the published version.***

***We have copyedited the manuscript.***

**Reviewers' comments:**  
  
**Reviewer #1:**   
*Manuscript Summary:*   
The manuscript presents a gait assessment study of 17 older adults during Nordic Walking. The authors investigated Nordic Walking with and without poles, and found differences in several gait parameters. Since the journal supports an unusual style of writing an article, the manuscript contains instructions like "Export to PDF" or "click on 'Run'". Therefore, I missed some technical parts of the manuscript.  
  
*Major Concerns:*  
N/A  
  
*Minor Concerns:*  
\*In the protocol instruction was stated that the data of the 6 sensor node were synchronized. How was that done?

This is briefly described in section 3.2.2), in the ‘NOTE’ portion. It states the following: “**NOTE:** Kinematic data is wirelessly transmitted from these sensors to an access point, which is used to precisely time the transmission of the synchronized data.” We also added to section 3.2.1), stating that the sensors are synced via the system’s docking station.

And how was synchronization done with the data of the motion capturing system?

This is briefly described in section 3.3), in the ‘NOTE’ portion. It states the following: “**NOTE:** Ensure that the motion capture system collects real-time information from both the left and right legs from foot strikes on each force platform and allows for spatial-temporal, kinematic, and kinetic analysis.”

Which communication protocol did the authors used? Did the protocol handle data transmission failures? Were there sections of missing data?  
\*There is also the note that the turns were removed automatically. It would be interesting to learn how the algorithm works (maybe a reference will help).

The information regarding the algorithm is not provided by the company due to commercial exclusivity. However, a reference to the User guide was provided in section 4.1

Did the authors ensured correct accelerometer/gyroscope calibration?

Information regarding the synchronization of the sensors has been added to section 3.2.1), and defines that the sensors must be docked together and calibrated prior to use. Further details of the calibration algorithm can be found in the User Guide mentioned above.

\*It would be interesting to learn how the participants were recruited for the study. Were these participants from a retirement home, or were they community-dwelling older adults, or recruited with a newspaper ad?

We have added a new 1.1) section to the manuscript that outlines the recruitment methods that should be used and populations that should be targeted for such a population. However, depending on the population being studied, these methods may be altered.

The recruitment method may have an influence in the results and may also bias the results. Some characteristics (weight, sex, etc.) would also be interesting.

As the focus of this journal has to do with methods, and not so much results, I am not sure where in the manuscript to place such characteristics. The goal of the paper is to substantiate the data collection techniques, regardless of the population being assessed, therefore I’m not sure that this is overtly important

\*What happend to the questionnaires and to the assessment data? Are there some interesting results?

The questionnaires were simply used to ensure that all participants met the study eligibility criteria. We did not run any correlations with any of the questionnaire data, therefore really don’t have any major results from these.  
  
*Additional Comments to Authors:*  
N/A

**Reviewer #2:**   
*Manuscript Summary:*   
General comments:  
The present deals with a very interesting approach to analyse gait patterns with an accelometry system. There are some methodological aspects I have to comment on, as the present version shows a lack of validity and reliability:  
To my understanding, you argue that using an accelometry system will be suitable to compare NP with WP walking, especially if you conduct a field test. Following your argument, I would have expected a study concerning the validity of the accelometry/gyroscope system by comparing the system with the golden standard (3D-kinematics). You should do this comparison by using the 'limits of agreement' approach which was presented by Bland and Altman (1986). As you did not present any references according to the accelometry/gyroscope system, I suppose that these data are missing.   
  
Bland JM, Altman DG Statistical methods for assessing agreement between two methods of clinical measurement Lancet. 1986 Feb 8;1:307-10. PMID 2868172  
Bland JM, Altman DG Measuring agreement in method comparison studies Stat Methods Med Res. 1999 Jun;8:135-60. PMID 10501650

We appreciate reviewer 2’s comment. However, the validation process of the system has been made prior to the commercialisation of the product and therefore was not at main goal of the present study. Furthermore, the rational behind using two systems to collect data is to complete the information relative to the gait pattern rather than duplicate it. Indeed, the traditional analysis using the optoelectronic system allows to quantify only short bout of gait while the accelerometer system allows to investigate longer trials. Therefore it was not our intention to compare these two systems. For more information regarding the validity and reliability of the system, please refer to the User guide.

Specific comments:  
Introduction  
As you describe in the title of the manuscript and in the methods section, you compare NP with WP gait pattern in elderly people. This point is missing in the introduction. Please add some information why older people are your target group.

We have added a few sentences as to why older adults were our main target group and what we hope to add to the existing literature. This is located at the end of the introduction, coinciding with our purpose statement.

Methods  
The instrumentation and the validity of its use should be presented more precisely:  
\*Lines 188-90: Present more details about the accelerometry system. Which system did you use.

Previous comments from the editor asked that we remove any commercial brands and names (e.g. Kistler, Vicon, etc.). Therefore, for the breadth of this journal, we are unable to include the type of force plate that was used, within the MS (according to the Editor). Although, it was an APDM accelerometry system that was used in this study.

Are there any studies on the validity and reliability of the system in gait analyses. If not, this would be a necessary point to include into your study, especially, as you compare gait pattern between NP and WP walking in elderly people.

\*Lines 192/193: Include more information concerning the sensor placement. As mentioned above, you need a reference for this procedure. Otherwise, you should add a study about the reliability of this procedure.

I have added more information pertaining to the placement of the sensors at all 6 landmarks. A reference to the User Guide has been added to the MS in section 4.1). Therefore, for more details please refer to previous comment on that topic and to the User guide.

\*Lines 208-210: Which force plate did you use.

Previous comments from the editor asked that we remove any commercial brands and names (e.g. Kistler, AMTI, Vicon, etc.). Therefore, for the breadth of this journal, we are unable to include the type of force plate that was used, within the MS (according to the Editor). Although, 2 Kistler force platforms were used in this study.

\*Lines 237-240: Add information about the software you use. Is it a custom-made software?

Once again, based on the previous editor comments, we cannot include the software used due to the use of commercial brands and names. Although, the software used was specifically from APDM and we used the algorithms within the software to extract a plethora of variables.

\*Data and statistical analysis: It would be more reader-friendly if you would add a table with the parameters you calculated.

We recognize that including the results in a table could facilitate the reading. However, we were unsure whether a second table could be included in the MS. We do have a table (with lower extremity power outputs) ready and will leave it to the editor’s discretion to decide whether or not this second table should be included.

\*Statistical analysis: I recommend adding the limits of agreement concerning the kinematic parameters and Bland-Altman-plots.  
  
References:  
Cite only published papers or conference presentations. Reference 15 is not available.

We double checked to see if this reference was available by copying and pasting the link into the address bar of our search engine. When we did this, the reference was available for us.

Revise ref. 14 according to JoVE style.

We have revised this to fit JoVE style.  
  
*Major Concerns:*  
N/A  
  
*Minor Concerns:*  
N/A  
  
*Additional Comments to Authors:*  
N/A

**Editorial comments:**  
  
1. ***NOTE: Please download this version of the Microsoft word document (File name: 53926) for any subsequent changes.***  
2. The authors have not submitted a response letter to the editorial and peer review comments with the previous revision. Please enclose a rebuttal or response letter. For this and the previous submission.  
  
3. JoVE is unable to publish manuscripts containing commercial sounding language, including trademark or registered trademark symbols (TM/R) and the mention of company brand names before an instrument or reagent. Please remove all commercial sounding language from your manuscript and replace it with a more generic term as much as possible throughout the entire manuscript. All commercial products should be sufficiently referenced in the table of materials/reagents. Examples of commercial sounding language in your manuscript are PowerPoint, etc.  
  
4. In step 3.3, how are the force platforms synchronized with the motion capture system? How are the force platforms zeroed? How are they collecting samples?

We have added additional steps as to what is required for synchronizing the system and force plates, zeroing them, and a mention of when to input the sampling rates.

5. Text in step 3.3.1 is not written in imperative tense. Please split this in two steps.

This has been changed into imperative tense. Also, due to the inclusion of the steps mentioned above (i.e. synchronization, etc.), we have renumbered the steps. Step 3.3.1) is now **3.4)**

6. Please split step 3.3.2 into two steps.

This has been split into two steps. Also, due to the inclusion of the steps mentioned above (i.e. synchronization, etc.), we have renumbered the steps. Step 3.3.2) has been split into two steps and are now number **3.4.1) and 3.4.2)**.