Reviewer’s report

Title: Pacing strategy in male elite and age group 100 km ultra-marathoners

Version: 1
Date: 18 August 2014
Reviewer: Brian Hanley

Reviewer’s report:

The purpose of this study was to investigate pacing strategies amongst male competitors in an ultra-marathon race. There is a rationale for this study in terms of showing differences between age groups and with regard to the area of ultra-marathon running in general. The authors have completed a reasonably good study, although there are some areas where the article can be improved. More specific comments are below:

- Major Compulsory Revisions

1. Methods, Paragraph 4 - Some of your statistics are on percentages (which tend to be skewed) so please arcsine transform them for the purposes of comparing groups (this is especially important given how close the values are to 100%). This webpage is quite useful in explaining more: http://archive.bio.ed.ac.uk/jdeacon/statistics/tress4.html

2. Methods, Paragraph 4 – While you have found p-values (which is fine), you should also have some measure of effect size. For example, a quick calculation using Cohen’s d of some of your significantly different findings showed that the effect size is very small and might not be important (this might actually improve the robustness of your important findings). Please calculate these and include them as appropriate.

3. You can simplify the results section a lot by combining the information from different tables, figures and text. For example, the statistical information in Table 3 should be included with the data in Table 2 (this will simplify the information for the reader greatly). Figure 4 and Table 2 should also be combined as they present the exact same data (some of which are unnecessarily repeated in the text).

4. Discussion, Paragraph 3 – Please provide a reference that supports your suggestions for why the athletes might be motivated by increasing daylight. I would also recommend you make more of the idea that knowing the finish is near, as this is something that has been noted in other long distance competitions, such as 50 km race walking (http://journals.humankinetics.com/ijspp-back-issues/ijspp-volume-8-issue-4-july/an-analysis-of-pacing-profiles-of-world-class-racewalkers).

5. Discussion, Paragraph 6 – Although you have explained this part quite well (about the differences in age groups), I think you can emphasise it even more as it’s probably the most important finding of your study. It is noticeable that you haven’t included any recommendations for ultra-marathon runners so please do
so (i.e. highlight the benefits of this research). One of them might be for younger athletes to be more cautious about pacing, to complete many shorter races in advance, etc.

- Minor Essential Revisions

1. You don’t need to use the term ‘ultra-marathon’ as often as you do, as it is clearly explained in the first sentence (Introduction, first paragraph) what defines an ultra-marathon. So, for example, you could rewrite “the 100 km ultra-marathon distance” as “the 100 km distance”.

2. There are instances where the meaning of a sentence is fairly clear but it could be improved by a native speaker of English to make it more idiomatically correct. For example, in the Introduction, Paragraph 2, “also the pacing strategy has been investigated” is better written as “the pacing strategy has also been investigated”.

3. Introduction, Paragraph 4 – Please delete the last part that’s in brackets as you have already explained this in the first sentence of this paragraph.

4. Methods, Paragraph 2 – It would be better to refer to Figure 6 here (and therefore also change the numbering of your Figures) as this is where you first mention that there is a change in altitude. This is important information that needs to be made clearer at this point so the reader knows the course has many changes in gradient before seeing the results.

5. Methods, Paragraph 4 – Would it not have been easier to perform a repeated measures ANOVA with repeated contrasts to compare the running speeds? This is essentially what you have done (although you don’t say if the ANOVA was repeated measures); please include some references to justify the choice of statistics used, so that the reader can see what the basis for them was (e.g. if they wanted to do a similar study to yours).

- Discretionary Revisions

1. Results, Paragraph 1 (and Figure 2) – I can’t really see the importance of comparing between editions of the race, as there are so many variables that can differ. Please either remove this information or justify its inclusion (it might have an importance that is not obvious to the reader). Table 5 is also confusing – were these the temperatures at the time of the race? How hot was it during the night (e.g. at midnight) when the athletes were actually running? I would advise you to either remove this Table or insert meaningful data like temperature and humidity values.

2. Similarly, in the Discussion, Paragraphs 1 and 2, please explain why the decrease in speed of the top ten finishers is such an important finding. I think you should remove this and concentrate on the other two findings, which are far more important and useful.

- Minor issues not for publication

1. In some instances (e.g. first line of Introduction, Paragraph 2), you have not included a space between the number and the unit. Please correct this as
appropriate.

2. Introduction, Paragraph 2 – Please remove the words “during the race” from the fourth line as this is obvious from the rest of the text.

3. Methods, Paragraph 3 (and throughout text) – Using ‘annual’ in this context doesn’t read very well, so in some cases you should omit it where it’s not needed, and in others you might want to rephrase it (e.g. to something like “the top ten athletes in each edition”).

4. Discussion, Paragraph 1 – Please change the phrase “such as the” in the first sentence as this was the actual race analysed, not an example of one.

5. Discussion, Paragraph 3 – Please use either 0530 or 5:30 a.m., and not a combination of both systems.

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests