Review of: "Throwing is affected by self-movement"

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Potential competing interests: No potential competing interests to declare.

I believe this is an interesting study with nice results. I think that authors performed two interesting experiments with results which can improve our understanding of multisensory perception and perception-action interactions.

However, I have several suggestions for authors, hopefully to make the paper better. I have a few general remarks, and several specific ones. I linked my suggestions to authors' sentences from the text, where it was possible and/or meaningful.

General remarks:

„In this study, we propose to test whether this perceptual overestimation has a correlation with the action of throwing a ball to a basket.“ – It would be great if authors can argue here why would this be important to examine, in accordance to what they previously wrote in the introduction or beyond. I think it is important to see the possible relevance of the research at this point.

How was the speed of 6 km/h chosen, based on what criteria did authors decided to use that certain speed?

“The target was a hoop 165 cm tall, and the indicator was a white stake of the same height with a tripod that allowed it to remain vertical at the point determined by the observer” – Why did the target and an indicator differ? Could this influence the results? We know that perceived distance and size are correlated, so could this be the reason for general distance underestimation?

“…proceeded to mark the position and then the process was restarted and performed 5 times for each condition.” – What was the starting point of an indicator? Was it the same always or not? Also, authors should state how many conditions were in total (treadmill position changes), or was it 5 in total - I am not sure, so please clarify this.

Effect sizes are missing in results for both experiments, Cohen's d, or eta squared should be added.

“Paired-sample t-tests revealed significant differences in both cases” – Post-Hoc tests should be done instead of simple t-test here, since they include multiple comparison correction, Sidak or Scheffe test for example.

Specific comments:

“…always 600 cm” – I think it would be clearer to write 6m. Also, why did authors decided to use just one distance? Would it be easier and methodologically more sound to have a few more, at least two?

“They were strongly asked to ignore external references (e.g., the assistant's height) when comparing distances and to focus specifically on their…” - Is this instruction enough to be sure that participants did not use these additional information as cues?

Figure 1 - please explain all the symbols on a scheme.

“What is striking about our results in Figure 3 is that the Distance Error is dependent on the height.” – I think several references might help to explain this results, referred to angular declination hypothesis:

Li, Z., & Durgin, F. (2012). An angular expansion hypothesis quantitatively accounts for several well-documented biases in space perception. *Journal of Vision*, *12*(9), 910-910.

Ooi, T, L. Wu, B. He, Z, J. 2001. Distance determined by the angular declination below the horizon. Nature 414 (8), 197-200.

Ooi, T, L. Wu, B. He, Z, J. 2006. Perceptual space in the dark affected by the intrinsic bias of the visual system. Perception 35, 605-624.

“Finally, as depicted in Figure 4, it is evident that the effect of running on the treadmill” – Analysis is missing here, are these differences significant? Also I would put this graph into the results section although it is not primarily aimed to perform this analysis. And, this is the only case of overestimation of the distance HR condition, and it should be noted at least, if not explained or related to other findings…