Review of: "Effect of Self-Movement on Visually Directed Throwing: Implications for Distance Perception"

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Potential competing interests: No potential competing interests to declare.

Although I find the topic of this study very interesting, in my view the manuscript is poorly written and some aspects of the study design seem to be faulty.

In the introduction, instead of discussing in a vague manner equations that seem to be irrelevant to the topic of the study, Authors should present in the detail their rationale for the study. This is, Authors should explain thoroughly i) why did they decide to use motor action execution as a measure of distance estimation? ii) why did they decide to use motor action execution without visual feedback? Yes, I am aware that Authors mention these issues in their manuscript but not in the introduction. In the General Methods Authors just write that throwing as a mean to gauge distance perception “minimizes the influence of prior knowledge”. I know that motor action execution is utilized for measuring distance perception, however, spatial information processing differs in ‘pure’ perception and action performance, and that should be discussed in the introduction. In the case of action execution without visual feedback Authors try to explain why they use such method (they talk about “perceptually directed action based on a representation of space in memory”), but this rationale is very unclear and difficult to understand. Again, this should be presented in the detail in the introduction. Additional thought is that maybe it would be better to conduct this study with smaller steps? This is, maybe both factors (i.e., action execution as a measure of distance perception and action execution without visual feedback) should not be included from the start in one experiment.

Regarding the study design my concerns relate to the Experiment 2. First, the target hoop should be presented to the participant and then covered before every throw (or up to three throws), and not once per block. Second, throwing should not be performed during running (especially on a treadmill where running is different). In my view, it should be done this way:

- Running condition:

one minute running – stop – max 3 throws;

one minute running – stop – max 3 throws;

one minute running – stop – max 3 throws;

and so on.

[Actually, this would resemble more the basketball situation, especially with the throws from 6 m distance]

- Standing condition:

one minute standing then max 3 throws;

one minute standing then max 3 throws;

one minute standing then max 3 throws;

and so on.

Running may affect throwing and that should be controlled.

There are also some problems with the results. Stats values are missing in the Experiment 1. In the Experiment 2 it should be explained in the detail how were the distance errors calculated. Results presented in Figure 4 show that although participants threw farther in the running condition than in the standing condition, paradoxically the error was smaller in the running condition, meaning that in this condition participants performed better. When describing the results for distance error at the ground level Authors mistakenly write that the error was minimal in both standing conditions, what is not true, as the minimal error was in the LR condition.

Finally, because the results from the Experiment 2 are incoherent, the Discussion is unintelligible and needs to be rewritten.