Review of: "Role of Environment and Experimenter in Reproducibility of Behavioral Studies With Laboratory Mice"

Thomas D. PREVOT[1]

1 Centre for Addiction and Mental Health

Potential competing interests: The author(s) declared that no potential competing interests exist.

This article summarizes previous research and novel information around the importance of reproducibility in behavioral studies. It brings some lights on the importance variability caused by the experimenter, the environment and the inherent strain differences.

While standardization of approaches across laboratories is an idealistic goal, and maybe optimistic thinking, it still contributes to reducing variability. Results show how the experimenter and the environment influence the behavioral tests with a variable dependent effects, but mostly show how strain differences, between DBA and C57 mice are the most important driver for phenotype differences. Indeed, behavioral outcomes across sites and between experimenters shows consistency in the results, whether it is performed with one experimenter, or the other, and whether it is performed at one site or the other. Analysis of all behavioral outcomes is inclusive and innovative, using heatmap presentation to graph the effect. It shows intensive ways of analyzing data which I hope will be used in future studies.

Of course the study has limitations. The use of only female mice is a critical one in my opinion. With the increasing efforts to consider sex as a critical variable, it is problematic not to include male in the study, in particular if they are known to suffer more from variability than females. Another missing element in this article, in my opinion, is the absence of automated tests to assay how automated assays can (or cannot) improve reproducibility. The authors mention the use of automated approaches to limit variability, which are more and more used in laboratory animals, but do not include one here. It would be interesting to investigate same. Finally, while putting an emphasis on variability between labs that can be caused by experimenters, the methods describe that the experimenters were a 25-years old female, and a 49-years old male. This already generate a bias that complicates comparison due to their age-difference, sex-different and potential experience-difference, so comparison between the 2 might not be appropriate.

To conclude this short review, it is important to remember that while variability between laboratories, studies, or experimenters may represent an issue in reproducibility of data, it remains the responsibility of the scientific director to interpret the “output” measures in a way that reflects how the animals behaved and how it may correspond to a specific outcome from their behavioral repertoire.