Introduction to the Special Issue on Open Research Practices and Reproducibility in Expertise Research

Samuel T. McAbee[1] and Brooke N. Macnamara[2]
[1]Department of Psychology, Bowling Green State University, USA
[2] Department of Psychological Sciences, Case Western Reserve University, USA

Correspondence: Samuel T. McAbee: smcabee@bgsu.edu; Brooke N. Macnamara: brooke.macnamara@case.edu

Abstract

In recent years there has been increased attention on research methods and practices that increase reproducibility, transparency, and data sharing, as well as attempts to replicate previous research. These open science initiatives increase confidence in empirical findings, leading to improved theory development. The goal of this special issue of the *Journal of Expertise* is to examine and discuss open research practices and reproducibility in the area of expertise research.

From its origins in the 1800s (e.g., Galton 1869), expertise researchers have used a variety of techniques to investigate individual differences in human performance. Expertise researchers may use behavioral genetics, neuroimaging, questionnaires, reaction times, and other techniques to examine skill differences. Further, researchers examine experts from different disciplines, from fingerprint categorizing to Olympic sports. The multidisciplinary nature of expertise, along with the small number of experts in many areas, can present challenges for scientists to engage in open science techniques and to reproduce findings.

Toward a culture of open science, the *Journal of Expertise* is an open access publication. All articles can be accessed by the public for free, and there is no charge to authors or institutions. Continuing to encourage a culture of open science, and in response to the broader conversation on reproducibility in the psychological sciences (e.g., Open Science Collaboration, 2012, 2015) and expertise research (McAbee, 2018), the *Journal of Expertise* put forth a call for a special issue dedicated to discussions on open science practices and a venue for replication studies. We present four articles in this issue.

First, Rachel Searston, Matthew Thompson, Samuel Robson, Brooklyn Corbett, Gianni Ribeiro, Gary Edmond, and Jason Tangen provide an overview of open science practices, notably *preregistration*, *open notebooks*, *open data*, *open materials*, and *open communication*. In addition to introducing these concepts, the authors describe how, using examples of research from their own laboratory, each concept can be applied to research on experts.

David Moreau focuses on *preregistrations*, outlining their benefits and challenges both broadly and specifically for expertise research. He provides a number of recommendations for using preregistrations to increase their benefit to expertise researchers.

In contrast, although Guillermo Campitelli suggests that scientists should be encouraged to complete preregistrations when possible, he argues that they should not be the gold standard of research. Rather, he takes the provocative

position that retiring statistical significance testing would improve research in general and expertise research in particular.

Finally, Harrison Kell and Jonathan Wai discuss an issue in study design that many expertise researchers face, but should be especially careful about: right-tail restriction. Specifically, they reason that when not enough people at the highest levels of performance are included in study designs, the results can erroneously suggest that no relations exist when in fact they do (i.e., Type II errors). The authors provide suggestions for combatting this statistical challenge in order to move toward more replicable studies in expertise research.

Collectively, the articles in this special issue provide a background on open science and reproducibility and their applications to expertise research. They illustrate the many approaches, some of which are controversial, that expertise researchers might use to increase robust, reproducible results. We believe that open science practices should be included in all expertise research, not just as a topic of discussion for special issues of scientific journals. We hope that the examples in this issue increase discussions of these approaches and encourage expertise researchers to consider how they can incorporate these methods into their own studies.

References

Galton, F. (1869). *Hereditary genius: An inquiry into its laws and consequences*. Macmillan and Co.

McAbee, S. T. (2018). Statistical and methodological considerations for research on expertise: Remedies from open science and the reproducibility crisis. *Journal of Expertise*, *1*(3), 136-143.

Open Science Collaboration. (2012). An open, large-scale, collaborative effort to estimate the reproducibility of psychological science. *Perspectives on Psychological Science*, *7*, 657-660. doi:10.1177/1745691612462588

Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science*, *349*(6251), aac4716. doi:10.1126/science.aac4716