Suggested Readings on the Bootstrap for Psychologists

Matthew D. Turner
Department of Psychology
Georgia State University
mturner46@gsu.edu

Unfortunately, most of the bootstrap literature is highly technical and requires somewhat advanced knowledge of mathematics or at least detailed understanding of advanced mathematical notation. Here we list papers targeted at psychologists, medical researchers, and general scientific readers.

There are several papers that introduce the topic, the most basic of which is Wright, et al. [1] After that there are two others that are also targeting psychologists; Hallgren on general simulation in R, and Field and Wilcox on robust methods in several specialized settings (multilevel models, , latent growth models). [2,3] Another simple paper for medical researchers is Haukoos and Lewis, but this uses different software.[4] These are all relatively elementary.

A general presentation not for psychology but with sophisticated examples and meant for a general scientific readership it the *Computing Science* piece by Shalizi.[5]

Much more advanced, but essential when doing bootstraps in the regression context is the paper.[6]

Additional citations used in this presentation

Fox and Weisberg have a whitepaper online which has been updated at various time, see link in slides.[7] Chernick and LaBudde's book length discussion is important as a general reference.[8] Keith et al. give an example of using bootstrapping for building an interval for a scatterplot smoother.[9]

Citations

1. Wright, D., London, K. & P. Field, A. Using Bootstrap Estimation and the Plug-in Principle for Clinical Psychology Data. *J. Exp. Psychopathol.* **2,** 252–270 (2011).
2. Field, A. P. & Wilcox, R. R. Robust statistical methods: A primer for clinical psychology and experimental psychopathology researchers. *Behav. Res. Ther.* **98,** 19–38 (2017).
3. Hallgren, K. A. Conducting Simulation Studies in the R Programming Environment. *Tutor. Quant. Methods Psychol.* **9,** 43–60 (2013).

4. Haukoos, J. S. & Lewis, R. J. Advanced statistics: bootstrapping confidence intervals for statistics with "difficult" distributions. *Acad. Emerg. Med.* **12,** 360–365 (2005).
5. Shalizi, C. Computing Science: The Bootstrap. *Am. Sci.* **98,** 186–190 (2010).
6. Carpenter, J. & Bithell, J. Bootstrap confidence intervals: when, which, what? A practical guide for medical statisticians. *Stat. Med.* **19,** 1141–1164 (2000).
7. Fox, J. & Weisberg, S. Mixed-Effects Models in R. *Append. R -PLUS Companion Appl. Regres. Httpcran R-Proj. OrgdoccontribFox-Companionappendix Html Accessed On* (2012).
8. Chernick, M. R. & LaBudde, R. A. *An Introduction to Bootstrap Methods with Applications to R*. (John Wiley & Sons, 2014).
9. Keith, A. M., Henrys, P. A., Rowe, R. L. & McNamara, N. P. Technical note: A bootstrapped LOESS regression approach for comparing soil depth profiles. *Biogeosciences* **13,** 3863–3868 (2016).