WSSR
WORKSHOPS ON SOCIAL SCIENCE RESEARCH

Concordia University · FACULTY OF ARTS AND SCIENCE

Bayesian Hierarchical Modeling for the Social Sciences
Dr. Jeff Gill
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June 7-8, 2017
9:00am – 4:30pm

Workshop Outline

This course covers the theoretical and applied foundations of Bayesian statistical analysis with an emphasis on computational tools for Bayesian hierarchical models. We will discuss model checking, model assessment, and model comparison. The course will cover Bayesian stochastic simulation (Markov chain Monte Carlo) in depth with an orientation towards deriving important properties of the Gibbs sampler and the Metropolis Hastings algorithm. Extensions and hybrids will be discussed.

We will then use Markov chain Monte Carlo tools to fit linear and nonlinear specifications with multiple levels, longitudinal features, and non-normal distributional assumptions. Lectures will include theoretical discussions of modeling and estimation as well as practical guidance for fitting complex multilevel models with R and JAGS software. Applications will be drawn from political science, sociology, epidemiology, economic policy, and public administration

Readings

Gill, Jeff. "The Insignificance of Null Hypothesis Significance Testing." *Political Research Quarterly*, vol. 52, no. 3, 1999, pp. 647–674. JSTOR, www.jstor.org/stable/449153.

Gill, Jeff and Christopher Witko. "Bayesian Analytical Methods: A Methodological Prescription for Public Administration." *Journal of Public Administration Research and Theory*, vol. 23, no. 2, 2013, pp. 457-494. https://oup.silverchair-cdn.com/oup/backfile/Content_public/Journal/jpart/23/2/10.1093/jopart/mus091/3/mus091.pdf

Leamer, Edward E. "Let's Take the Con Out of Econometrics." *The American Economic Review*, vol. 73, no. 1, 1983, pp. 31–43. JSTOR, www.jstor.org/stable/1803924.

King, Gary. 1986. "How Not to Lie With Statistics: Avoiding Common Mistakes in Quantitative Political Science." *American Journal of Political Science*, 30: pp. 666–687. https://gking.harvard.edu/files/gking/files/mist.pdf

Gill, Jeff and Andrew J. Womack. "The Multilevel Model Framework." In *The SAGE Handbook of Multilevel Modeling*. Scott, Marc A, Jeffrey S Simonoff and Brian D Marx (eds). London: SAGE Publications Ltd, 2013. Pp. 3-20. *SAGE Research Methods*. http://pages.wustl.edu/files/pages/imce/jgill/mlmchap4.pdf