BAYESIAN METHODS FOR THE SOCIAL SCIENCES:
A GENTLE INTRODUCTION

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Overview
Bayesian methods are becoming ever more common in the social sciences and for good reason: they allow political scientists to estimate a wider range of models and do so even if the data are sparse. Despite the advantages, many social scientists shy away from Bayesian methods because of their difficulty. This course aims to strip away most of the mathematical complexity and offers a gentle introduction into the topic. The focus is on computational methods and their application to well-known models in the social sciences. By the end of the course, participants should understand the Bayesian terminology, be able to program Bayesian methods, and feel confident reading and communicating estimation results.

Schedule
Day 1—Morning:
Theory: Likelihood-based inference; Bayes' theorem; priors; posteriors; point estimation; credible intervals; Bayesian versus frequentist inference.

Day 1—Afternoon:
Computation: An introduction to Markov Chain Monte Carlo methods, including Metropolis-Hastings and Gibbs; convergence; programming in JAGS.
Application: The computational methods are illustrated in the context of the linear regression model.

Day 2—Morning:
Application: Categorical dependent variables, including binary outcomes, ordinal outcomes, and polytomous outcomes.

Day 2—Afternoon:
Application: Multilevel models; latent variable models.

Suggested Readings:

- Bolstad, William M. 2007. *Introduction to Bayesian Statistics.* New York: Wiley. (A nice introduction into the statistical theory of Bayesian inference.)
- Gill, Jeff. 2007. *Bayesian Methods: A Social and Behavioral Sciences Approach.* Boca Raton: Chapman & Hall. (A solid discussion of Bayesian inference and its computational aspects but not for the faint of heart.)
- Howson, Colin, and Peter Urbach. 2005. *Scientific Reasoning: The Bayesian Approach.* Chicago: Open Court. (A nice discussion of Bayesian inference from a philosophy of science perspective.)
- Jackman, Simon. 2009. *Bayesian Analysis for the Social Sciences.* New York: Wiley. (A comprehensive discussion of applications with JAGS code. Some chapters are quite complex though and probably not well-suited for beginners.)