Multilevel Modeling
SUMMER CAMP

May 13-15, 2013   Ketchum 116   Jennifer Wolak   wolakj@colorado.edu

This workshop is an introduction to multilevel modeling and the unique challenges that arise with hierarchical data. Many times we are interested in explaining the behavior of individual observations as a function of their attributes and the context they inhabit. Examples of multilevel data in political science include survey respondents nested within country contexts, voters nested within states, support for subsidies within commodities and countries, and legislators within congressional committees. Over the course of our three day workshop, we will consider the problems associated with clustered data, the remedies available to address these issues, and the basic tools necessary to implement multilevel modeling.

Given the short timeline of the course, we will not be able to cover absolutely all of the interesting aspects of multilevel modeling, but we will cover the basics with enough depth so that you will be able to use straightforward multilevel models in your own applications. Those interested in developing greater specialization in a topic are encouraged to contact me for additional background readings on any particular area.

prerequisites and expectations

In terms of prerequisites, you should have a basic familiarity with probability, statistics, and the classic linear model. If you have successfully completed PSCI 7085 and PSCI 7095, you should have sufficient background for the course.

Like most summer camps, your participation will be for the fun of it rather than for any course credit. Unlike most summer camps, there will be homework assignments that you are strongly encouraged to complete. Practicing the skills from the class will be the best way to master them, and I recommend that you take this opportunity to get feedback on your efforts to acquire these new skills.

reading list

Snijders, Tom A.B., and Roel Bosker. 2011. *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling*. 2nd edition. Thousand Oaks, CA: Sage Publications.

I recommend that you purchase a copy of Snijders and Bosker's multilevel textbook in advance of the class. On the first day, I will discuss some of the alternatives as well as the pros and cons of the major multilevel modeling textbooks, but I like this book for its combination of depth and a reasonable price point. I recommend the second edition over the (less complete) first edition. We will also have a handful of journal articles on our reading list.

CLASS SCHEDULE

Introduction to multilevel modeling

Monday, May 13, 9 a.m. – 12 p.m.

When and why to use multilevel modeling, comparisons to other approaches.

- Snijders and Bosker, Chapters 1-3.
- Steenbergen, Marco R., and Bradford S. Jones. 2002. "Modeling Multilevel Data Structures." *American Journal of Political Science* 46(1):218-37.

Specification of multilevel models

Tuesday, May 14, 9 a.m. – 12 p.m.

The random intercept model and the random coefficient model.

- Snijders and Bosker, Chapters 4-5.

Estimation and diagnostics for multilevel models

Tuesday, May 14, 1:30-3:30 p.m.

Testing and model specification, model fit.

- Snijders and Bosker, Chapters 6, 7, and 10.
- Rahn, Wendy M., and Thomas J. Rudolph. 2005. "A Tale of Political Trust in American Cities." *Public Opinion Quarterly* 69:530-560.

Hierarchical generalized linear models

Wednesday, May 15, 9 a.m. – 12 p.m.

Multilevel logit and multilevel ordered logit.

- Snijders and Bosker, Chapter 17.

Extensions of the multilevel model

Wednesday, May 15, 1:30-3:30 p.m.

Survey weights in multilevel modeling or catch-up or whatever the class wants to cover.

- Snijders and Bosker, Chapter 14.