Preparation for Statistics in Sociology

August 16, 2012 – August 23, 2012
McKinney Room, Soc/Psych 329

Instructor: Jake Fisher
Faculty Advisor: Steve Vaisey

Objectives
This course provides an introduction for the two-semester graduate statistics courses by reviewing the first six chapters of Agresti & Finlay, as well as addressing topics in research design and mathematics which underlie the practice of statistics in the social sciences. Students will gain an understanding of the logic of variable selection, the mathematical literacy needed for graduate-level statistics, and fundamentals of statistical computing with Stata.

A Note on Computers
Students should bring their own laptops. If a student does not have a laptop to use, the department can provide a laptop. Laptops should be used for the afternoon lab sessions only. Students should not use laptops, phones, tablets, etc. during the morning lectures.

Class Schedule

Friday, August 16, 1:00pm – 5:00pm

Afternoon: Research design, calculus
Chapters 1 – 2 of Agresti and Finlay
Research design: types of variables, measurement, sampling, bias, logic of causal order
Reading regression tables
Calculus overview: limits, derivatives, integrals

Assignment: ASR articles
Read articles from a recent issue of The American Sociological Review, distributed in class, with an eye towards variables used, measurement, and causal pathways. One students will present an article at lunch each day, in an order to be determined in class.

Saturday, August 17, 9:00am – 3:00pm

Morning: Matrix algebra
Scalors, vectors, matrices
Matrix operations

Afternoon: Introducing Stata
Good programming: logging, commenting, do-files
Variables: labels, formats, missing values
Logical operators

Acknowledgements: This course draws inspiration and material from similar offerings in the Duke Political Science department, taught by Sunshine Hillygus, Jacob Montgomery, and Chris DeSante.
If-then statements
Recoding variables
Subsetting data by variables and by observations: keep, drop, preserve, restore

Monday, August 19, 9:00am – 3:30pm

Morning: Probability & Univariate statistics
   Chapters 3 – 4 of Agresti & Finlay
   Sets and counting
   Distributions, marginal and joint
   Expected values

Afternoon: Tables in Stata
   Advanced recoding: loops, expressions with gen
   Cross-tabulations
   Macros

Wednesday, August 21, 8:30am – 1:00pm

Morning: Univariate statistics (continued) & likelihoods
   Chapter 5 of Agresti & Finlay
   Univariate statistics
   Sampling distributions & the central limit theorem
   Likelihood functions

Friday, August 23, 9:00am – 5:00pm

Morning: Hypothesis testing
   Chapter 6 of Agresti & Finlay
   Hypothesis testing

Afternoon: Additional topics or review as needed

References


