HTS 8803: Quantitative Methods in Social Research

WEDNESDAY 1:35-4:25PM
CLASSROOM: OLD CIVIL ENGINEERING (OCE) BUILDING, RM 104
Instructor: Allen Hyde
Office Hours: W 9-10am; Tu 1-3pm, or by appointment
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COURSE DESCRIPTION

This is an introductory social statistics course for graduate students. The primary goal of the course is to help the student develop proficiency in multiple regression analysis, which is the foundation of modern quantitative social research. A central focus of the course is to introduce students to the fundamentals of statistical reasoning and to the role of statistical methods in social research. In addition, the student will become acquainted with Stata, one of the leading statistical software packages which is widely used in the social science. Topics include linear regression, hypothesis testing and model selection; regression diagnostics; non-linearity and functional form; mediation and moderation effects; path analysis; and factor analysis.

READINGS

There are several required readings for the course and several that are optional for additional reference.

REQUIRED:

Alan C. Acock. 2016. *A Gentle Introduction to Stata, 5th Edition*. College Station, TX: Stata Press. ISBN: 978-1-59718-185-3
$58.00 from Stata Press: http://www.stata.com/bookstore/gentle-introduction-to-stata/

Joshua D. Angrist and Jörn-Steffen Pischke. 2009. *Mostly Harmless Econometrics: An Empiricist's Companion.* Princeton, NJ: Princeton University Press. ISBN: 978-0691120355
$34.27 from Amazon: http://www.amazon.com/Mostly-Harmless-Econometrics-Empiricists-Companion/dp/0691120358

David A. Kenny. "Mediation." Available at: http://davidakenny.net/cm/mediate.htm.

Michael Wallace and Rodrigo Figueroa. 2012. "Determinants of Perceived Immigrant Job Threat in the American States." *Sociological Perspectives* 55:583-612.

Patricia K. Hall and Steven Ruggles. 2004. "Restless in the Midst of Their Prosperity: New Evidence on the Internal Migration of Americans, 1850-2000." *The Journal of American History* 91:829-846.

Casey Borch, Allen Hyde, and Antonius H.N. Cillessen. 2011. "The Role of Attractiveness and Aggression in High School Popularity." *Social Psychology of Education* 14:23-39.

FOR EXTRA REFERENCE (OPTIONAL):

Alan Agresti and Barbara Finlay. 2009. *Statistical Methods for the Social Sciences*. New York: Wadsworth.

Paul D. Allison. 1998. *Multiple Regression: A Primer*. Thousand Oaks, CA: Pine Forge.

Damodar Gujarati and Dawn Porter. 2008. *Basic Econometrics*. 5th edition. Boston: McGraw-Hill/Irwin.

Otis Dudley Duncan. 1966. "Path Analysis: Sociological Examples." *American Journal of Sociology* 72:1-16.

COMPUTER LAB

There will be a several computer lab sessions where students will develop proficiency in Stata and work on the lab assignments. The lab will be under the direction of the Instructor. Lab periods will occur at the end of class every week (though they may not occur every week).

STATISTICAL SOFTWARE

In this course it is important to spend some time learning formulas and their internal logic and doing hand calculations to demonstrate proficiency with statistics. But we will also seek to understand how to apply this statistical knowledge with the use of Stata, one of the leading statistical software packages. Many of the principles learned in Stata will apply in other statistical software packages such as SPSS, SAS, and R. And, of course, the statistical principles behind the different software packages are the same.

A great online resource for Stata, SPSS, and R instruction is located at this link:
http://www.ats.ucla.edu/stat/stata/webbooks/

THINGS TO BRING TO CLASS

I will post class notes before class each week by Tuesday evening. Print or bring a laptop to add your own notes to them

Bring a pen or pencil; also potentially paper if you don't bring a laptop

Bring something that has a calculator. A scientific calculator would be preferable but a phone or laptop should also be fine

COURSE REQUIREMENTS AND GRADING
Course grades will be based on several components:

- There will be 4-5 lab assignments to demonstrate proficiency in statistical methods. Lab assignments are handed out in one class and due at the beginning of the next class. *No late lab assignments will be accepted unless there are extenuating circumstances for which I may ask for written documentation. If you must miss class due to a scheduled school event or religious holiday, you should let me know in advance to work out alternative arrangements.*

- A course paper, using multiple regression to demonstrate proficiency in the use of multiple regression analysis in a sociological analysis. The student may use a dataset from the course or another dataset outside the course. But if another dataset is chosen, the student is responsible for making sure it is accessible and appropriate for the course. The topic of the course paper and appropriateness of the dataset will be determined in consultation with the professor. Opportunities will be provided during the semester to discuss the organization and writing of the paper with the professor. The course paper will be due during exam week. More details about the course paper will be provided as the semester progresses.

Each component of the grade will be weighted as follows:
- Class participation: 10%
- Final Paper presentation: 10%
- Lab assignments: 40%
- Course paper: 40%

The following grading scale will be used in the class:

90-100	A
80-89	B
70-79	C
60-69	D
< 60	F

EXCELLENT DATA REPOSITORIES FOR POTENTIAL USE IN PROJECTS:

1. Integrated Public Use Microdata Series (IPUMS): https://www.ipums.org/
- National and global census data (individual level)

2. Inter-University Consortium for Political and Social Research (ICPSR): https://www.icpsr.umich.edu/icpsrweb/landing.jsp
- Contains thousands of datasets on all sorts of topics

3. Roper Center: http://ropercenter.cornell.edu/
- Public opinion datasets

4. General Social Survey (GSS): http://www3.norc.org/GSS+Website/
- Collects demographic, behavioral, and attitudinal information, plus special interest topics on the United States (also an international version).

5. Social Explorer: http://www.socialexplorer.com/
- Aggregate Census data on neighborhoods, metropolitan areas, towns, etc.

STUDENTS WITH DISABILITIES AND OTHER ISSUES
Students who think that they may need accommodations because of a should contact the Center for Office of Disability Services as soon as possible in the semester to verify their eligibility for reasonable accommodations. Within the first two weeks of class, students should provide a letter from the Office of Disability Services outlining the accommodation that they will need. For more information, please go to http://disabilityservices.gatech.edu/#

WEEKLY TOPICS AND READINGS

Date   **Topic**

Week 1: Aug 24th   Introduction; Types of Quantitative Data; Review of Basic Concepts in
                           Elementary Statistics

Week 2: Aug 31st   Finish Review of Elementary Stats; Discuss Scientific Method in
                           Quantitative Research
Reading: *Angrist and Piscke pages 1-24; (Skim Acock Chapters 5-6)*

Week 3: Sept 7th   Difference of Means Test; Analysis of Variance; Chi Square
Reading: *Acock Chapters 7 and 9*

Week 4: Sept 14th   Correlation, Bivariate Regression, and Displaying Relationships
Reading: *Acock Chapter 8*

Week 5: Sept 21st   Multiple Regression
Reading: *Angrist and Piscke pages 25-68; Acock Chapter 10*

Week 6: Sept 28th   Dummy Variables and Nonlinear Associations
Reading: *Acock pages 313-324*

Week 7: Oct 5th   Interaction Terms (Moderation)
Reading: *http://www.ats.ucla.edu/stat/stata/faq/conconb.htm*
                           Acock pages 306-312

Week 8: Oct 12th   Reading, Constructing, and Critiquing Quantitative Research Papers
Reading: *Wallace and Figueroa 2012; Borch, Hyde, and Cillessen 2011; Hall and*
                           Ruggles 2004

Week 9: Oct 19th   Individual Meetings with Students for Papers

Week 10: Oct 26th   Regression Diagnostics
Reading: *Acock pgs 281-292;*
                           http://www.ats.ucla.edu/stat/stata/webbooks/reg/chapter2/statareg2.htm

Week 11: Nov 2nd   Handling Missing Data: Interpolation, Extrapolation, and Multiple
                           Imputation
Reading: *Acock Chapter 13*
    http://www.economist.com/news/finance-and-economics/21576362-seminal-analysis-
    relationship-between-debt-and-growth-comes-under
    http://thecolbertreport.cc.com/videos/kbgnf0/austerity-s-spreadsheet-error---thomas-herndon

Week 12: Nov 9th   Instrumental Variables and Spuriousness
Reading: *Angrist and Piscke pages 113-146*

Week 13: Nov 16th   Indices, Scales, and Factor Analysis
Reading: *Duncan; Acock Chapter 12*

Week 14: Nov 30th   Student Paper Presentation Week
Readings: *NA*

Finals Week   Any leftover student presentations (*if necessary); Final Papers due*

Optional extra topics not covered

Path Analysis
Reading: *Kenny*

Logistic Regression
Reading: *Acock Chapter 11*

Matching
Reading: *Angrist and Piscke pages 68-90*

Panel Data Analysis
Reading: *Angrist and Piscke Chapter 5*

Structural Equation Modelling
Reading: *Acock Chapter 14*

Multilevel Modelling
Reading: *Acock Chapter 15*

Item Response Theory (IRT)
Reading: *Acock Chapter 16*