

Sociology 361, Statistics for Sociologists II, Fall, 2017

11:00-12:15 TR, 6102 Sewell Social Science Bldg,
Summary Period: Saturday, 12/16/2017, 5:05-7:05 p.m.

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Lab 301: M 9:55-11:50, 3218 SSSB

Lab 302: M 1:20-3:15, 3218 SSSB

Subject matter: This is a second course in social statistics, developing the theory and practice of applied linear regression analysis. Mastery of previous course material on the basics of inference, hypothesis testing, and confidence intervals is expected (and review materials for this are provided below). Basic theory of regression will be developed in parallel with many practical exercises using Stata, a statistical package for professional social science research.

Learning Objectives: Students completing the course will be ready to conduct their own research using linear regression analysis and secondary data sources, at a level befitting beginning research assistants on faculty research projects. They will be able to find, download and format social science data suitable for analysis. They will understand how to make, interpret and critique advanced specifications involving dummy variables, interactions, and nonlinear transformations. They will be able to use diagnostics for various threats to model fit and interpretation. They will be able to write an article-length description of an independent research project that uses linear regression. By the course's end they will have a solid foundation for studying the many methods that are extensions of linear regression.

Prerequisites: Sociology 360, "Statistics for Sociologists I," or equivalent. Junior standing. Competence in basic algebra.

Required Text: Rachel A. Gordon, *Regression Analysis for the Social Sciences* (RASS), 2nd ed., Routledge, 2015. ISBN 978-1-138-81251-2 (pbk).

Supplementary Readings:

S. Juul. 2004. *Take Good Care of Your Data*. www.epidata.dk/downloads/takecare.pdf

(The following are to be posted on the class website:)

R.A. Gordon. 2012. *Applied Statistics for the Social and Behavioral Sciences* (AS). Routledge, excerpts as follows. (Please note: *Carefully ignore* any parts of these excerpts that deal with SAS instead of Stata; usually, SAS is discussed first, and Stata second.)

AS 4.5. Complex Sampling Designs, pp. 83-86

AS 5.6. Weighted Statistics, pp. 123-133

AS 6.2-4 Sample, Population and Sampling Distributions, pp. 150-178

AS 8.5. Complex Sampling Designs, pp. 281-285

AS 14.4. Complex Sampling Designs, pp. 509-511

P.D. Allison. 2002. *Missing Data*. Sage. pp. 1-12, 27-34, 50-55.

R.F. DeVellis. 2003. *Scale Development Theory and Applications*. Sage. pp. 6-39.

Neter, W. Wasserman, and M.H. Kutner. 1989. "Some Basic Results in Probability and Statistics," pp. 1-9 in *Applied Linear Regression Models*, 2nd. ed., Irwin.

Von Hippel, P.T., S.V. Scarpino, and I. Holas. 2016. *Sociological Methodology* 46(1):212-251. "Robust estimation of inequality from binned incomes."

Homework assignments: At the end of each of the text's chapters are Review Questions, Review Exercises, Chapter Exercises and a Course Exercise. A selection of the questions of the first three types will be assigned for each chapter, and posted on the Learn@UW website for our course. These exercises are due at the beginning of the lecture exactly one week following the completion of the chapter. If the chapter is wrapped up on a Tuesday, the homework is due the next Tuesday, for example. At the end of the term this rule may need to be modified.

Computing requirements and resources: The course requires you to use Stata (in batch command mode) for many assignments. The text contains enough information about operating Stata for the work you need to do. Social Science Computing Cooperative (SSCC) staff and your TA will make sure you have enough skills to get the job done. Stata consulting is also available to you: Stop by 4226 Sewell Social Sciences Building and look for the yellow SSCC Consultant or red Stat Consultant sign, or send a message to helpdesk@ssc.wisc.edu. Make sure to say you are enrolled in this course.

You might consider attending a mini-course in Stata if you have time. Check the SSCC's calendar for the four-session course, "Stata for Researchers," here: http://www.ssc.wisc.edu/sscc_jsp/training/index.jsp. This is completely unnecessary for our class, though.

Computer lab sessions: All of the weekly lab sessions will be held in a computer lab, 3218 Sewell Social Science Bldg., instead of any other room listed in the course schedule.

Computing outside the lab: SSCC computers with Stata are available for course assignment use via the web. You will be offered advice concerning how best to get access from your home or from other campus computer labs or wifi connections. We require all students to begin their computing work in the SSCC computer lab, however. This simplifies giving everyone a basic familiarity with the systems and programs.

Work independently: All computer-related assignments are to be based on program code independently written and run by each individual student. In addition, each assignment's written analysis must be the independent work of the individual student. Evidence of borrowing or copying between or among students will be (heavily) penalized. However, students are welcome to consult with each other in general terms about strategies for completing the various assignments. You **must turn in your own computer output** with each assignment that requires the use of a computer.

Lab attendance: Lab attendance will be taken every week and will be given consideration as part of your qualitative discretionary grade.

Purposes of Lab:

1. Go over material covered in the previous week's lecture.
2. Provide advice and a foundation to complete homework assignments.
3. Review answers to previous homework assignments.
4. Learn statistical programming to help you conduct social science research.

Computers/Phones in Lecture and Lab: When lab is held in the computer lab, you obviously will be on a computer. Don't use any laptops or phones while in lab or lecture. Don't distract others, including the instructors.

Lab assignments: Any assignments made in lab will be due at the beginning of lab on the announced due date.

Instructions for turning in homework and lab assignments: All homework and lab assignments are to be handed in to the TA by the indicated deadlines. Late assignments will not be accepted except by pre-arrangement with the TA (*not* the professor), and only for sufficient cause. Your TA will establish rules for the acceptable format of homework (e.g., paper vs. electronic, pen vs pencil, pdf vs. Word), and for exact submission procedures.

Term paper: A term paper applying the regression methods of the class to a published or unpublished social science data set is required. The paper should be concise, taking no more pages than you need to complete the work. In any event, it should generally be no more than 15 double-spaced pages, plus tables, figures, and a (short) bibliography. Details of the assignment will be distributed in a separate document on the second day of class.

Grading (provisional allocations).

Homework	30%
Exams	30% (15% each)
Term Paper	30%
Class Participation	10%

Classroom and lab participation will be qualitatively assessed by your TA and professor. Occasional pop quizzes may count toward class and lab participation.

Office Visits: If you are habitually shy or quiet in class or lab please visit your TA and/or your professor in office hours so we can get to know who you are and discuss any problems or issues you may have.

Special Needs Arrangements: To make special arrangements for testing, assignments, or other aspects of the course you must qualify for disability services through the McBurney Center. Their website has detailed instructions on how to qualify: <http://www.mcburney.wisc.edu/>. Please notify the professor within the first 2 weeks of class if you have or anticipate having authorization from the Center and we will be happy to make the necessary arrangement.

Academic Integrity: As with all courses at the University of Wisconsin, you are expected to follow the University's rules and regulations pertaining to academic honesty and integrity. Students are expected to know and follow the standards outlined by the Offices of the Dean of Students. See their website (<https://conduct.students.wisc.edu/academic-integrity/>) for a complete description of behaviors that violate the University's standards as well the disciplinary penalties and procedures.

Departmental Notice: The Department of Sociology regularly conducts student evaluations of all teaching assistants near the end of the semester. Students who have more immediate comments, complaints or concerns about the teaching assistant may report them either to Professor Chaeyoon Lim, Associate Chair, or Professor James Raymo, Chair, 8128 Social Science.

Reading Assignments: Our intention is to cover the entire textbook, in order from beginning to end, along with additional readings as noted above and in the schedule that follows. Students will be expected to have read the relevant material(s) before the corresponding lecture.

Expected Schedule

Week	Dates	Topic and Readings (T = Tuesday, R = Thursday)
1	9/7 (R)	Course goals, examples of regression research, math/stat prereqs overview. Read: RASS Ch1., and Neter excerpt.
2	9/12-14	T: Description of term paper and introduction to data sources. With guest lecturer Charlie Fiss, Director, Data and Information Services Center. Read: RASS Ch. 2.
		R: Selected topics in statistical packages, data documentation, and Stata batch jobs. Read: RASS Ch. 3-4, and Juul article.
3	9/19-21	T: Practicalities for the analysis of really existing datasets 1: Scale construction, income/wealth coding. Read: DeVellis, pp. 6-39; Von Hippel et al. (just skim this one if it is too daunting).
		R: Basic Bivariate Regression. Read: RASS Ch. 5. Review as needed: AS 6.2-4, Population, Sample, Sampling Distributions
4	9/26-28	T-R: Basic Bivariate Regression, continued.
5	10/3-5	T: Basic Bivariate Regression, continued. Read: AS 8.5.
		R: Basic Multivariate Regression. Read: RASS Ch. 6.
6	10/10-12	T-R: Basic Multivariate Regression, continued.
7	10/17-19	T: Basic Multivariate Regression, continued. Read: AS 14.4.
		R: Practicalities for the analysis of really existing datasets 2: Sampling weights; simple approaches to missing data values. Read: Excerpts AS 4.5, AS 5.6; Allison, pp. 1-12.
8	10/24-46	T: Midterm topics catch-up and/or review
		R: Midterm exam
9	10/31-11/2	T-R: Dummy Variables. Read: RASS Ch. 7
10	11/7-9	T-R: Interactions. Read: RASS Ch. 8
11	11/14-16	T-R: Nonlinear relationships. Read: RASS Ch. 9
12	11/21 (T)	T: Indirect Effects, Omitted Variable Bias. Read: RASS Ch. 10.

Week	Dates	Topic and Readings (T = Tuesday, R = Thursday)
Thanksgiving Holiday		
13	11/28-30	T: Indirect Effects, Omitted Variable Bias, continued.
		R: Outliers, Heteroskedasticity and Multicollinearity. Read: RASS Ch. 11.
14	12/5-7	T: Outliers, Heteroskedasticity and Multicollinearity, continued
		R: Advanced Missing Data Methods (time permitting). Read: Allison, pp. 27-34, 50-55, and other selection(s) to be determined.
15	12/12 (T)	Catch-up and/or review for final exam (to be held 12/16, at 5:05-7:05 p.m.)