

Sociology 521: Regression Models

Spring 2016, Section 1, class number 04250, 3 credits

Syllabus and Course Outline

Professor: Jennifer Givens, PhD.

Class Meetings: Mondays 2:50-5:50 in either the conference room or the computer lab in Wilson-Short Hall (rooms 201 or 231)

Office Hours: Mondays 1-2 pm and Wednesdays 11:10 am -1:00 pm and by appointment in Wilson Hall 239

Email: jennifer.givens@wsu.edu

Required Text:

There is no required text for this course, however, below I suggest several recommended texts if you want further resources.

Course Summary:

This graduate-level seminar will introduce you to regression analysis as it is used in sociology and other social science disciplines. Regression analysis is a powerful statistical tool that can be used to examine the relationship between a dependent variable and two or more independent variables. The primary substantive topics in this class will relate to a thorough examination of the ordinary least squares (OLS) regression model, including coverage of standard regression assumptions. As time permits we will explore more advanced extensions of the basic model. [In order to succeed in this class you should already be familiar with basic concepts that are covered in an introductory statistics course, such as descriptive measures for continuous distributions (e.g., mean, standard deviation) and association (e.g., correlation) and hypothesis testing.]

This is an applied course, focusing on real-world applications of regression techniques. In this class you will learn how to specify and estimate regression models, how to interpret results from regression models, how to present results from regression models in publication-quality tables. This will include thinking about how to interpret and evaluate the regression-based social science research of others, and how to produce your own unique research based on regression.

We will use the statistical software package Stata in this course because it is used by many sociologists. Computers in the network lab in Wilson-Short Hall (room 231) have the program installed. Stata is a useful and powerful software application that you will use throughout your studies and professional career. Time and attention will be given to learning the mechanics of the application and how to successfully use Stata to execute the statistical methods covered in this seminar.

This course is split between lectures and lab sessions. The instructor will take an active role in the labs, which will involve a series of ungraded practice assignments designed to help students learn how to appropriately and effectively employ Stata to execute and interpret the different statistical techniques. The seminar emphasizes fundamental concepts and the successful application of the covered methods as well as the ability to interpret the results verbally and in writing.

Course Requirements and Grading:

Students are required to take three quizzes (each worth 25% of final grade) and conduct their own short quantitative study and write a “research note” style article (worth 20% of final grade). For this project students are encouraged to find and use datasets that align with their substantive interests. Students will be given data to and practice assignments to complete in the labs. While these assignments will not be graded, they will be discussed in class. Overall “attendance and participation” will count as 5% of final grades.

The following schedule will be used to determine grades:

| Course Grade | Total Points | Percentages | Course Grade | Total Points | Percentages |
|--------------|--------------|-------------|--------------|--------------|-------------|
| A | 93-100 | 93-100% | C | 73-76 | 73-76% |
| A- | 90-92 | 90-92% | C- | 70-72 | 70-72% |
| B+ | 87-89 | 87-89% | D+ | 67-69 | 67-69% |
| B | 83-86 | 83-86% | D | 63-66 | 63-66% |
| B- | 80-82 | 80-82% | D- | 60-62 | 60-62% |
| C+ | 77-79 | 77-79% | E | 0-59 | 0-59% |

Course communication:

Your primary source of information about the course is the syllabus but I will announce any changes in the schedule and due dates in class or via email. I will use WSU's on-line course management system Blackboard to distribute course materials such as the homework assignments and the data you will analyze.

Missed exercises or exams:

If you are unable to complete an assignment due to an unanticipated legitimate event you must notify me as soon as possible by email and we will decide on an alternate due date. Legitimate reasons for absences include personal injuries, illnesses, and deaths in the family.

Attendance Policy:

I will not take formal attendance in this class; however, I will not provide any lecture materials outside of class. If you miss class, you will need to get the notes from another student.

The Registrar's Academic Regulations say that if you are only going to miss one or two classes, you just need to notify me. Please do so by email so I have a written record. This applies for those of you who might have the flu, a cold, or some other ordinary illness from which you will recover in a few days. The Registrar's attendance policy is in the academic regulations policy, item #73: <http://www.registrar.wsu.edu/Registrar/Apps/AcadRegs.ASPX>

However, if you are going to miss multiple classes or if something else is going on that may interfere with your ability to perform well in class you should contact the Dean of Students Office at 335-5757. They may also refer you to Student Services if you would benefit from personal counseling or Academic Services if you would benefit from academic counseling.

Advice and help:

I encourage you to meet with me if you have any questions or doubts about the class or the course materials. You need not feel anonymous in this class. I am paying close attention to your performance in class and want all of you to succeed. However, we are partners in your success, which means that you must take the initiative to resolve course-related problems. I am more than happy to help you, but if you do not seek out my advice or assistance I will assume that you are not having problems.

Students with Disabilities:

I am committed to providing assistance to help you be successful in this course. Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, please visit the Disability Resource Center (DRC). All accommodations MUST be approved through the DRC (Admin Annex Bldg, Room 205). Please stop by or call 509-335-3417 to make an appointment with a disability specialist.

Emergency Notification System:

The WSU Campus Safety Plan (<http://safetyplan.wsu.edu>) and the emergency management website (<http://oem.wsu.edu/emergencies>) have information about what to do in the event of an emergency. Please review them. The WSU ALERT system (<http://alert.wsu.edu>) provides updated news about emergencies and other alerts. Register your emergency contact information with the Crisis Communication System on myWSU. Look for the Emergency Notification box on the right side of the page.

Academic Integrity:

ACADEMIC INTEGRITY is taken very seriously. If you plagiarize, or otherwise cheat, or help anyone else to do so, on any assignment, you will receive a failing grade for the course and your name will be forwarded to the Office of Student Conduct (<https://conduct.wsu.edu/>).

Changes in the course:

I reserve the right to make changes in the course to better serve class needs or adjust to unforeseen circumstances. This includes changing the dates on the course schedule, the assignment of points, and policies. I will notify students of these changes as far in advance as possible.

Schedule:

The schedule section presents the general order in which topics will be discussed, although we may deviate from the schedule as needed. The list of topics is intended as a general overview only, to give you an idea of what we will cover:

1. Introduction to Regression Models
2. Interpreting Multiple Regression Results
3. Simple Linear Regression to Multiple Linear Regression
4. Regression in Stata
5. Model Performance and Evaluation
6. Regression Assumptions and Diagnostics (including graphs)
7. Transformation, Dummies, Interactions, Robust Standard Errors
8. Transformation, Dummies, Interactions, Robust Standard Errors continued
9. Common Problems in Regression Analysis: Collinearity, Heteroscedasticity etc.
10. Logistic Regression
11. Logistic Regression continued and Further Topics
12. Final Presentations and Final Paper due

Today: Participation Assignment:

- First, please write up a summary of what you learned last semester in Stats 511 Data Management if you took this class, or if you did not take SOC 511 last semester just let me know and instead write up a summary describing your background in statistics. While I have the syllabus for 511, I am interested to hear your perception of the topics you have learned about and where you are in your learning regarding applied quantitative methods.
- Second, please describe what you hope to gain from this class.
- Third, please describe the data you are thinking of using for this course/your research moving forward and what sorts of research questions you are interested in using these data to explore.
- Finally, please locate an article related to the topic area you are interested in that uses regression analysis, describe the method it uses in your paper, and send me a PDF of the article along with your paper.

This assignment (3-5 pages) will help you to review where you are in your learning and your research process, and it will help me get to know each of you and to better understand your situations so I can best cater the class to your needs.

Please email this to me as a word document by the end of the day on Thursday January 14, 2016.

Recommended texts if you want further information:

1. Kahane. 2008. *Regression Basics*, 2nd ed. Sage.
2. Allison. *Multiple Regression: A Primer*. Pine Forge.
3. Mitchell. *Data Management Using Stata: A Practical Handbook*. Stata Press.
4. Longest. *Using Stata for Quantitative Analysis*. Sage.
5. Hamilton. *Statistics with Stata*. Brooks/Cole Cengage Learning.
6. Frankfort-Nachmias and Leon-Guerrero. *Social Statistics for a Diverse Society*. Sage.
7. Chatterjee and Hadi. *Regression Analysis by Example*. Wiley.
8. Wooldridge. *Introductory Econometrics*. Thompson.
9. Gujarati. *Basic Econometrics*. McGraw-Hill-Irwin.
10. Fox. *Applied Regression Analysis and Generalized Linear Models*. Sage.
11. The Sage “little green books” aka. Quantitative Applications in the Social Sciences (series).
12. Hancock and Mueller Eds. *The Reviewer’s Guide to Quantitative Methods in the Social Sciences*. Routledge.

Research Brief Assignment for SOC 521 Regression Analysis (DUE: 4/25/2016)

Students are required to conduct their own short quantitative study and write a “research note” style article (worth 20% of final grade). For this project students are encouraged to find and use datasets that align with their substantive interests. This final paper should not be more than 9 single spaced pages or 4000 words, including references but not including tables. This is a max limit. This assignment can also be effectively completed with a shorter project. While all final projects tend to be stressful, I want this to be useful more than stressful, so keep in touch with any concerns or questions. I look forward to reading some interesting papers! I will provide a sample paper.

We have been working all semester on the steps that you go through with data, such as beginning by looking at your data graphically and exploring relationships between variables, summary statistics, and violations of regression assumptions, leading up to running regression models, evaluating those models, and techniques for appropriately deciding which variables to use and models to report. This research brief assignment gives you a chance to follow this procedure and then write it up, as you will with your own research moving forward.

The research brief should follow the standard article format for a publishable journal article. This means it should have the following sections:

Abstract. The general formula for an abstract: identify prior research and where it’s lacking, pose your research question, introduce your methods, outline findings, and spell out implications/theoretical advance.

Begin with an introduction that clearly introduces the topic/problem/research question/context and describes how this project aims to contribute. Think: What is the unique contribution of your project to the body of research? (A longer paper would probably also signpost the rest of the paper and provide a plan for what the paper accomplishes, but since this is research note, this is not necessary.)

Next you need an introduction to the theoretical perspectives that you are engaging. (In this case I am your audience and you should assume I am unfamiliar with the theories you are talking about, so explain them clearly to an outsider; in general this is not a bad way to approach this section). You have a research question and you probably have some hypotheses about how it will be answered by the data. Think: What is the theoretical basis of your hypothesis? Another way to think about this is: What theoretical perspectives could I bring to bear or test regarding this topic/question?

Within this section, or in a separate section called literature review, you will also include a brief literature review of some of the most important articles that address your topic and the theoretical perspectives. 10 references is sufficient for this assignment.

While qualitative research tends to work to develop theory, quantitative research tends to test theoretically derived hypotheses. In this section ideally you should clearly state some hypotheses that you are testing, and make sure these are clearly linked to the theories you described.

Next, describe the data you are using. Describe the source, its validity, maybe other studies that use it, and also describe what you learn about it with some summary statistics, graphs, etc.

Next describe the methods. Spend some time briefly describing OLS regression in your own words. This is good practice.

In these sections you will describe your dependent variable and your independent variables in detail, sometimes using subheadings. Think about designing your paper in a way that is most clear for your reader. You may want to combo data and methods into one section.

Now write up the results. This is a (rather dry) write up of what the models show. You want to build your models as we discussed in class, and report several models (I would say somewhere around 3 for this class, but it depends on your project).

Now the fun part. In your final section, discussion and conclusion, (this is sometimes separated into 2 sections) you get to talk about what the results from the models mean. Make this interesting and explain it as clearly as possible. Do your analyses support or not support your hypotheses and the theoretical perspectives? What does all this mean? Think about answering the question: So what? Also: NEVER overstate your results. We’ll talk more about this in class.

Don’t forget to report summary statistics and correlations in addition to your models. Excel usually works well for this.

Don’t forget a works cited page, in a format that makes sense for your discipline.

For the sociology students in the class, this assignment is designed to ideally help you to begin formalizing your master’s thesis. While you must turn in a formalized final project for this class, this project will hopefully be a work in progress that could turn into your master’s thesis. Alternatively, this could just be a project for this class that might turn into a publishable paper later on.

For other students in the class, this assignment will ideally turn into a publishable piece of research for you, either in the form in which you turn it in for this class, or as a later, more developed version.

On our last class meeting (4/25 – **this is also the due date for the paper, please turn in a hard copy, including tables**), each of you will **present your project orally** (max 20 minutes, including time for Q and A if you’d like). This can be formal or informal, PowerPoint or not, it’s up to you, you will earn the credit (20% of the project grade) pretty much simply if you do it. Obviously if you put effort in, it will be more useful for everyone, but again, this is not intended to be too stressful.