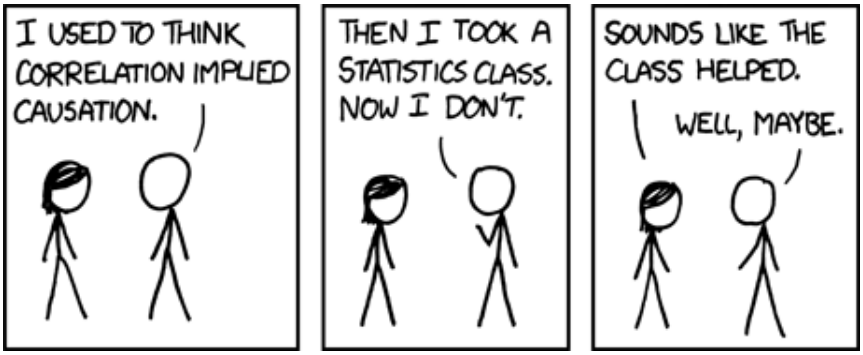
Sociology 511
Sociological Methods II (Graduate Statistics)
Spring 2021

DUE TO COVID-19, THIS CLASS IS ONLINE.

Professor: Pat Hastings (pat.hastings@colostate.edu) Tuesdays, 12-2 p.m. and by appointment (please email to schedule)

Lecture: Wednesdays, 3:00-5:50 p.m. on Zoom. Lectures will be recorded for those unable to attend or who want to watch again, but regular attendance and participation is expected.

Canvas website: https://colostate.instructure.com/courses/117210



Overview
This course introduces graduate students to statistics for sociological research. We will explore the statistical concepts and methods that sociologists most commonly use to gather and analyze quantitative evidence, including descriptive statistics, probability and sampling distributions, statistical inference and hypothesis testing, correlation, and multiple regression with continuous and categorical data. Students will use Stata (a popular and powerful computer program) to put those skills into practice, and they will apply their skills to real sociological data to gain competence and confidence in the use of these methods.

Learning Goals

- Understand the basic logic of statistics and the major concepts
- Identify the appropriate statistical methods and models given a specific type of data and research question
- Gain familiarity with a statistical software package and conduct simple statistical analyses with real data
- Interpret the results of various statistical models and discuss their relevance for testing hypotheses and evaluating competing theories.
- Build a strong foundation in order to be able to learn new statistical methods in the future and to excel in future advanced graduate-level quantitative methods courses.

Prerequisites, or, What You Should Already Know

A prerequisite for this course is an undergraduate-level statistics course. Ideally, topics covered would include descriptive statistics, measures of central tendency and variability, probability, statistical inference, correlation, and regression. Realistically, students' previous training (and retention of it) will vary widely, and I will try to adjust the course appropriately. An additional prerequisite is a graduate-level general research methods course. If your background in statistics and methods is not very strong, you can still do very well in this course, but you should expect to put in some extra work at the beginning. If you are unsure about your preparedness for this course, talk to me.

Evaluation

Your grade will be assigned using the standard letter +/- system based on:

- Lecture attendance and participation (10%)
- Homework assignments (40%)
- Midterm exam (20%)
- Final research project (30%)

Lecture attendance and participation: This is a small seminar. I hope you can attend and actively participate in every class, but it will be recorded and posted online in case you must miss. Participation includes asking questions (please do!), answering my questions, and group work with others during class.

Homework assignments: Most weeks there will be a homework assignment. They will be a combination of statistics problems to solve by hand and exercises with Stata. You will typically have one week to do each assignment and they will be due at midnight on the day before class. I will drop your lowest score. Working together with other students in the class is strongly encouraged, though you must submit your own work!

Midterm exam: This will be take-home exam focused on evaluating your understanding of the main ideas and concepts, not how well you can memorize facts. As such, you may use your textbook, notes, and computer/calculator on the exams. You may not consult other individuals (nor the internet).

Final research project: Each student will conduct a small research project that will use the statistical methods to examine a research question. Students will write a report—with tables and figures—and provide a replication file of their analyses. More details will be provided later in the semester.

Textbook

There is one required book:

> Agresti, Alan. 2018. *Statistical Methods for the Social Sciences* (5th edition). Pearson (ISBN: 9780134507101)

Many students have had success buying the paperback Global International Edition, which is (usually?) the same book, but cheaper. If you are unsure you have the right edition, just check with me. Other readings and resources for the class will be posted on the course website.

Statistical Computing

I will teach the course using Stata (www.stata.com). Stata is flexible, powerful, relatively user-friendly, and commonly used by social scientists. It has a large and diverse user community with many user-written commands that keep Stata continually up to data with new developments. We will be using Stata in most classes, for your assignments, and in your final project. You will need access Stata on your own computer (we will discuss options during the first class).

If you prefer to complete the course using R or Python, you can discuss this option with me. I also use these tools. Note, however, that I will be providing class examples and assignment solutions in Stata. Relative to these other programs, Stata has the lower bar to entry and it's not too hard to move from one program to another once you really understand what you are trying to do!

How Do I Learn This Stuff?

Since this is a statistics course, it will be different from the typical sociology course. Here is some advice:

- Most of the material is cumulative, so it is **absolutely essential that you keep up with the course material**. If you find yourself falling behind, ask for help!
- Being good at statistics requires thinking through how to solve problems. Statistics cannot be learned simply by reading a book or listening to a lecture. **You should not expect to really understand the material until after you have completed the relevant assignments.**
- Learning to do statistics and use statistical software is in many ways like learning a language. It gets easier the more you use it. **Start the assignments early so you have time to work on them in multiple sessions** and so can talk with others and get help if you need it.
- **Please ask questions if you do not understand something**. If it is unclear to you, it is probably unclear to other students as well. If it doesn't make sense in lecture, it will probably not make sense later when you are staring at your notes and trying to do the course assignments.
- Finally, know that I am aware that many of you are dealing with more challenging situations than you might in typical face-to-face semester—including family responsibilities, mental and physical health issues, precarious housing, and unstable work schedules. **My hope is that this class is enjoyable and useful to you, without being a tremendous burden. If there are external factors that are detrimentally affecting your performance in this class,** please consider talking with me so we can adjust our expectations appropriately.

COURSE OUTLINE

#	Date	Substantive topic(s)	Reading	Due
1	1/20	Introduction, hypotheses, association and causality, levels of measurement; sampling	Ch 1 & 2	
2	1/27	Intro to data and Stata		Ungraded assessment
3	2/3	Descriptive statistics: measures of the center and of variability	Ch 3	HW 1
4	2/10	Bivariate descriptives, figures	Ch 3	HW 2
5	2/17	Probability distributions, normal distribution, sampling distribution, Central Limit Theorem	Ch 4	HW 3
6	2/24	Inference: point and interval estimation, confidence intervals	Ch 5	HW 4
7	3/3	Significance tests, p-values	Ch 6	HW 5
8	3/10	Comparison of two groups, t-tests	Ch 7	HW 6
9	3/17	Tests for tables, Chi-square	Ch 8	
10	3/24	Midterm		Exam!
11	3/31	Intro to Linear regression	Ch 9	
12	4/7	Intro to Multivariate relationships and multiple regression	Ch 10 & 11	HW 7
		SPRING BREAK!!!		
13	4/21	Regression with categorical predictors, categorical and dummy variables, ANOVA	Ch 12 & 13	HW 8
14	4/28	Heterogeneous effects, moderation, regression with interaction terms	Ch 10.3 & 11.4	HW 9
15	5/5	Logistic regression	Ch 15	HW 10
		Final project due by midnight on May 14, 2021		Final Project

Notes

- If (and when) there are changes to this schedule, you will receive adequate notice.
- All substantive topics below will also be covered in our statistical program, along with topics such as cleaning and managing data, replication files, data visualization, and basic programming.
- The "Reading" column shows which chapter(s) will be relevant to the lecture for that week, but we will not cover everything in each chapter. I encourage you to skim these chapters in advance, but a detailed reading before lecture is not expected.
- There will be additional short readings and videos for many of the weeks. These will be announced in class and posted on Canvas.

Other Important Matters

In-Class Decorum: Please be prepared to give the class your full concentration. Avoid checking email/social media/etc during class time. Colorado State University has stated five Principles of the Community: inclusion, integrity, respect, service and social justice (http://diversity.colostate.edu/principles-of-community/). Your conduct in this class should adhere to these to help us generate an open, tolerant, and respectful learning environment that we can all flourish in.

Office hours: I encourage you to take advantage of my office hours. I am happy to discuss the course and assignments, your research interests, or anything else you would find useful. Email me if you would like to meet (Normally I say here that you are welcome to drop by if my door is open, but these are pandemic times…)

Copyrighted Course Materials: Please do not share material from this course in online, print, or other media. Course material is the property of the instructor who developed the course. Materials authored by third parties and used in the course are also subject to copyright protections. Posting course materials on external sites (commercial or not) violates both copyright law and the CSU Student Conduct Code. Students who share course content without the instructor's express permission, including with online sites that post materials to sell to other students, could face appropriate disciplinary or legal action.

Academic Integrity: This course will adhere to the CSU Academic Integrity Policy as found on the Student' Responsibilities page of the CSU General Catalog (https://catalog.colostate.edu/general-catalog/policies/students-responsibilities/#academic-integrity) and in the Student Conduct Code (https://resolutioncenter.colostate.edu/wp-content/uploads/sites/32/2018/08/Student-Conduct-Code-v2018.pdf) Do your own work. Don't cheat. If you are unsure what is permissible, please speak with the instructor. Violations will result in a grading penalty and be addressed through the appropriate University mechanisms.

Important information for students on COVID-19: **All students are required to follow public health guidelines in any university space, and are encouraged to continue these practices when off-campus(es). Students also are required to report any COVID-19 symptoms to the university immediately, as well as if they have potentially been exposed or have tested positive at a non-CSU testing location. If you suspect you have symptoms, please fill out the COVID Reporter (https://covid.colostate.edu/reporter/).** If you have COVID symptoms or know or believe you have been exposed, it is important for the health of yourself and others that you complete the online COVID Reporter. Do not ask your instructor to report for you; if you report to your instructor that you will not attend class due to symptoms or a potential exposure, you are required to also submit those concerns through the COVID Reporter. If you do not have access to the internet to fill out the online COVID-19 Reporter, please call (970)491-4600.

If you report symptoms or a positive test, your report is submitted to CSU's Public Health Office. You will receive immediate, initial instructions on what to do and then you will also be contacted by phone by a public health official. Based on your specific circumstances, the public health official may:

- choose to recommend that you be tested and help arrange for a test
- conduct contact tracing
- initiate any necessary public health requirements or recommendations and notify you if you need to take any steps

If you report a potential exposure, the public health official will help you determine if you are at risk of contracting COVID.

For the latest information about the University's COVID resources and information, please visit the CSU COVID-19 site (https://covidrecovery.colostate.edu/).

Resources for Disabled Students: If you have a diagnosed learning or physical disability, which may require special accommodations, please talk to me at the beginning of the course. The Student Disability Center (https://disabilitycenter.colostate.edu) can also help facilitate your individual needs. I will work with you and to make sure any individual needs are appropriately accommodated.

Support: Any student who may be the victim of sexual harassment, sexual misconduct, relationship violence, stalking or retaliation is encouraged to report to CSU through one or more of the following resources:

- Emergency Response 911
- Deputy Title IX Coordinator/Office of Support and Safety Assessment (970) 491-1350
- Colorado State University Police Department (non-emergency) (970) 491-6425

For counseling support and assistance, please see the CSU Health Network, which includes a variety of counseling services that can be accessed at: http://health.colostate.edu/
And, the Sexual Assault Victim Assistance Team is a confidential student resource that does not have a reporting requirement and that can be of great help to students who have experienced sexual assault. The web address is http://www.wgac.colostate.edu/need-help-support.

Need Help? CSU is a community that cares for you. If you are struggling with drugs or alcohol and/or experiencing depression, anxiety, overwhelming stress or thoughts of hurting yourself or others please know there is help available. Counseling Services has trained professionals who can help. Contact 970-491-6053 or go to http://health.colostate.edu. If you are concerned about a friend or peer, tell someone by calling 970-491-1350 to discuss your concerns with a professional who can discreetly connect the distressed individual with the proper resources (http://supportandsafety.colostate.edu/tellsomeone). Rams take care of Rams. Reach out and ask for help if you or someone you know is having a difficult time.