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SOCY 10: QUANTITATIVE ANALYSIS OF SOCIAL DATA
Fall 2021

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Professor: Gregory Sharp   **Location:** 061 Carson Hall
Email: gregory.k.sharp@dartmouth.edu   **Time:** MWF 8:50-9:55am
Office Hours: Virtual by appointment: https://calendly.com/gregorysharp   **X-hour:** Th 9:05-9:55am

Extra Stata help: Jianjun Hua jianjun.hua@dartmouth.edu (email Jianjun to schedule an appointment)

Course Description

This course is intended to introduce students to basic statistical techniques researchers use to investigate social, economic, and political phenomena. The statistical techniques you will learn are simply tools to organize data and present information effectively about the world. For example, researchers have recently employed these statistical techniques to answer the following kinds of questions:

> "How have societal opinions about same-sex marriage changed over time?"
> "Do people who live in impoverished neighborhoods have better or worse health than those who do not?"
> "Are birth defects related to local levels of water pollution?"
> "Does getting a college degree have the same labor market benefits for Black and White individuals?"

By the end of this term, you too will be skilled enough in the art of statistics to address these types of questions. Just as important, however, this course is designed to help you become informed consumers of social statistics. This will involve attaining an awareness of the many uses of statistics in everyday life, gaining the ability to think critically about the use of statistics, and developing the skills necessary to interpret and critique social scientific research employing these techniques.

This course is designed to introduce you to the logic of statistical analysis, <u>not to test your mathematical abilities</u>. A rudimentary familiarity with basic arithmetic and a few algebraic functions will suffice for material presented in the course. This means that even if you are insecure about your math prowess, this class should not intimidate you. More than anything, <u>success in this course requires diligence</u>. The material covered in the course is incremental, with the presentation of new material building on what you learned in earlier segments of the course. You will have the greatest chance of success if you attend class regularly, start your problem sets early, and make sure to visit office hours to get clarification on issues about which you are unsure.

Course Structure/Delivery

As you know, we are back in person this academic year. I plan to stick with this format as best as we can, but we are going to need to be flexible. I do expect you to come to class, <u>but attendance is not required unless we have made a one-on-one or group appointment</u>. So, lectures, Stata labs, and problem-set practicing will all be in person. Of course, we might need to adjust our classes during the term, and I do have the option of posting some asynchronous recordings, which may limit our face-to-face time. Also note that <u>all office hours and meetings with me are virtual (schedule via Calendly)</u>. I will make sure to keep you posted on any changes in course delivery week to week, and please regularly update me on any issues you are facing, especially with respect to attending class and/or completing the coursework (i.e., if you are sick). Please note that we will not use the X-hour period until the last (third) unit of class.

Course Materials and Resources

Textbook (Optional): Healey, Joseph F. 2015. *Statistics: A Tool for Social Research (10th Edition)*. Stamford, CT: Cengage.
- I recommend either buying a used version or renting for the term. You also might want to look into buying a used copy of the even cheaper 9th edition.

- Again, the book is not required but <u>highly recommended</u>. Many of you might be able to get by fine by solely using my lectures and slides. If so, that's great, but you may want the book as an added resource.

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Here are some other <u>optional</u> texts that we will not use, but might be of interest to you:

Acock, Alan. 2012. *A Gentle Introduction to Stata* (Revised Third Edition). College Station, TX: Stata Press.
> ****If you are having trouble with Stata, this is an excellent resource.**

Bergstrom, Carl T. and Jevin D. West. 2020. *Calling Bullshit: The Art of Skepticism in a Data-Driven World*. New York: Penguin.

Best, Joel. 2001. *Damned Lies and Statistics: Untangling Numbers from the Media, Politicians, and Activists.* Berkeley: University of California Press.

Firebaugh, Glenn. 2008. *Seven Rules for Social Research.* Princeton: Princeton University Press.

Silver, Nathan. 2012. *The Signal and the Noise: Why So Many Predictions Fail—But Some Don't.* New York: Penguin.

Wheelan, Charles (Dartmouth '88). 2013. *Naked Statistics: Stripping the Dread from the Data.* New York: WW Norton.

Ziliak, Stephen T. and Deirdre N. McCloskey. 2008. *The Cult of Statistical Significance: How the Standard Error Costs Jobs, Justice, and Lives.* Ann Arbor: University of Michigan Press

For a good application of statistics to everyday life, I recommend that you add these blogs to your daily reading:
> Family Inequality (Philip Cohen): http://familyinequality.wordpress.com/
> Vox: www.vox.com
> The Upshot (NYTimes): http://www.nytimes.com/upshot/
> CityLab: https://www.bloomberg.com/citylab
> Statistical Modeling, Causal Inference, Social Science (Andrew Gelman): http://andrewgelman.com/

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Statistical Software and Electronics

We will be using **Stata 16** for Stata labs, problem sets, and the group project. Stata is available for free on the Dartmouth Network (Mac/PC) and is also available on most public computers on campus. If you are off campus, you can use Dartmouth's Global Connect VPN to access the KeyServe. For more information on Stata resources and installing Stata on your computer, see the below websites. <u>Please use these resources and the helpdesk for any installation questions</u>.

> MAC: https://services.dartmouth.edu/TDClient/1806/Portal/KB/ArticleDet?ID=64644
> PC: https://services.dartmouth.edu/TDClient/1806/Portal/KB/ArticleDet?ID=64632

Info for using Stata off campus: https://services.dartmouth.edu/TDClient/1806/Portal/KB/ArticleDet?ID=64133

A brief note on Stata: Learning a new statistical analysis program and programming language is <u>difficult</u>. I highly recommend that you practice on your own to hone your skills. I also recommend that you meet with me or Jianjun if you have Stata related questions.

Here are some wonderful Stata coding resources you should check out:

Jianjun Hua's research guides: http://researchguides.dartmouth.edu/content.php?pid=316205&sid=2587562
Stata YouTube Channel: https://www.youtube.com/user/statacorp/videos
UCLA Stata Resources: https://stats.idre.ucla.edu/stata/modules/
Stata Online Course and Cheat Sheets: http://geocenter.github.io/StataTraining/
Princeton Stata Resources:
> http://data.princeton.edu/stata/
> http://dss.princeton.edu/training/StataTutorial.pdf
> http://dss.princeton.edu/online_help/stats_packages/stata/

Calculator: You will also need a calculator to complete your problem sets and exams. A basic, inexpensive calculator that has square-root _and_ squaring functions will suffice. Alternatively, you can use your cell phone calculator, but make sure you can square and take square roots of numbers (but you cannot use your cell phone during exams). If you do have a graphing calculator with advanced functions (such as automatic calculations for standard deviations, t-tests, etc.), you are not permitted to use these advanced functions on exams.

Course Requirements and Grading

Exams (50%): There will be _two_ mid-term exams (see schedule below for dates) each worth _25%_ of your total grade. While not strictly cumulative, each exam will require the use of skills learned earlier in the term. Each exam will consist of a series of problem sets plus a few multiple-choice questions. You will _not_ have to use Stata during the exams, but I may ask you to _interpret_ Stata output. Students should bring their calculator, but please note that the exams are _not_ open book. I will provide students with the materials allowed during the exams (e.g., formula sheet, distribution tables, scratch paper).

Group Project (45%): Students will also have the opportunity to conduct a project with their classmates—five students per group (see the description of the project on Canvas.). The group project is one of the most important, and perhaps the most rigorous aspect of this course. These projects will require a significant time commitment, so it is important to choose a topic that you are excited about and to start working on it early! At the end of the term, you will be asked to evaluate the contribution of your fellow group members to the project. These evaluations will be factored into your project grade. In addition, the group project has several components, including a final report worth the lion's share of the points. The breakdown for the group project grade is as follows:

Group Project Assignment 1:	5%
Group Project Assignment 2:	5%
Group Project Assignment 3:	5%
Final Report:	85%

A final version of the research report is due (submitted to Canvas or emailed to me) **Tuesday 11/16 by 11:59pm**, but it can be submitted any time before the deadline.

Final Homework Assignment (5%): In lieu of a final exam, each student will complete and submit a final homework assignment. The assignment is similar to your problem sets (see below), but will focus on material from the last unit of class, as well as the group project. Again, this is an individual take-home assignment; collaboration with other students is not permitted.

Problem Sets (0%): There will be several _ungraded_ problem sets this term. _These problem sets are not to be turned in to me_. I will provide the answer key with each assignment, so that you can check your answers after completing the problems. I am happy to meet with students during in-person class sessions or office hours to discuss any questions regarding the problems. Please use these times to ask questions about the problem sets or Stata _rather than emailing me questions_. These exercises are designed so that they should be completed before we begin a new topic.

NOTE on problem sets and exams: It is important that you show your work! If you write down the answer without showing how you solved for that answer, even if the answer is correct, you may not receive full (or perhaps any) credit. Practice doing this on your problem sets and you will be in great shape for the exams!

Grading Scale: Below is the percentage breakdown on which your final grade will be based. Please note that I will not negotiate final grades and there are no opportunities for extra credit.

Final Grade	Percent:
A	95-100
A–	92-94.9
B+	89-91.9

B	83-88.9
B–	80-82.9
C+	77-79.9
C	73-76.9
C–	70-72.9
D	60-69.9
E	Below 60

Relevant Policies and Resources

Attendance: While you are expected to come class on a regular basis, attendance is not required and therefore does not explicitly figure into your final grade. (I will say that in my experience teaching this class for many years at different universities, people who come to class perform significantly better than people who do not.) Please do let me know if you are sick and unable to attend class for an extended period (and make sure to not come to class if you are feeling sick!). Lecture slides, problem sets, and Stata materials will be provided at the beginning of each week, so that students can conveniently work from home if necessary.

Safety: In accordance with current College policy, all members of the Dartmouth community are required to wear a suitable face covering when indoors, regardless of vaccination status. If you need to take a quick drink during class, please dip your mask briefly for each sip. Eating is never permitted in the classroom. (The only exception to the mask requirement is for students with an approved disability-related accommodation; see below.) If you do not have an accommodation and refuse to comply with masking or other safety protocols, I am obligated to assure that the Covid health and safety standards are followed, and you will be asked to leave the classroom. If you refuse to comply with masking or other safety protocols, and to ensure the health and safety of our community, I am obligated to report you to the Dean's office for disciplinary action under Dartmouth's Standards of Conduct. Additional COVID-19 protocols may emerge, so please pay attention to emails from the senior administrators at the College. I will be sure to communicate any changes and their resulting implications for our class community.

Accommodations: Students requesting disability-related accommodations and services for this course are required to register with Student Accessibility Services (SAS; Getting Started with SAS webpage; student.accessibility.services@dartmouth.edu; 1-603-646-9900) and to request that an accommodation email be sent to me in advance of the need for an accommodation. Then, students should schedule a follow-up meeting with me to determine relevant details such as what role SAS or its Testing Center may play in accommodation implementation. This process works best for everyone when completed as early in the quarter as possible. If students have questions about whether they are eligible for accommodations or have concerns about the implementation of their accommodations, they should contact the SAS office. All inquiries and discussions will remain confidential.

Late Policy: Students should notify me via email if/when you need an extension on an assignment (not an exam). I am willing to grant one 24-hour extension on any assignment, no questions asked. But after that, late assignments will have their grade reduced by 7 percentage points for each day late (e.g., 1 day late a grade of 100 would be reduced to a 93; 2 days, 86; and so on). Given the circumstances, I am willing to be flexible with this policy, within reason. **Remember to please meet with me if you are having difficulty keeping up with the coursework.** Make-up exams will only be considered on a case-to-case basis and should only be used in the case of emergencies or a legitimate conflict with the exam date. If you foresee a conflict with an exam date, please contact me as soon as possible so we can make the necessary arrangements.

Academic Integrity: Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner and all members of the Dartmouth community are expected to act in accordance with this principle. Academic integrity includes a commitment not to engage in or tolerate acts of falsification, misrepresentation, or deception. Such acts of dishonesty violate the fundamental ethical principles of the Dartmouth community and compromise the worth of work completed by others. As such, dishonesty of any kind will not be tolerated and students found in violation of the Dartmouth Academic Honor Principle will be notified and reported to the

appropriate authorities (http://student-affairs.dartmouth.edu/policy/academic-honor-principle). For additional resources on the Academic Honor Code, plagiarizing, and proper citation of sources, please see the following link: http://writing-speech.dartmouth.edu/learning/materials/sources-and-citations-dartmouth

Religious Observance Policy: Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course (such as an exam day), please meet with me before the end of the second week of the term to discuss appropriate accommodations.

Basic Needs: Your safety and well-being are more important than anything going on in class. Please feel free to reach out to me if you need to talk. Any student who faces challenges securing food, housing, or personal safety is urged to contact the Dean of the College for support.

Statement of Mental Health and Resources: The academic environment at Dartmouth is challenging, our terms are intensive, and classes are not the only demanding part of your life. There are a number of resources available to you on campus to support your wellness, including your undergraduate dean (http://www.dartmouth.edu/~upperde/), Counseling and Human Development (http://www.dartmouth.edu/~chd/), and the Student Wellness Center (http://www.dartmouth.edu/~healthed/).

Consent to Record: Please see the following language regarding your consent to recordings (https://dcal.dartmouth.edu/resources/course-design-preparation/syllabus-guide). I leave this in here just in case we revert to remote course instruction during the term.

1. Consent to recording of course and group office hours:
   a) I affirm my understanding that this course and any associated group meetings involving students and the instructor, including but not limited to scheduled and ad hoc office hours and other consultations, may be recorded within any digital platform used to offer remote instruction for this course;
   b) I further affirm that the instructor owns the copyright to their instructional materials, of which these recordings constitute a part, and distribution of any of these recordings in whole or in part without prior written consent of the instructor may be subject to discipline by Dartmouth up to and including expulsion;
2. Requirement of consent to one-on-one recordings:
   a) By enrolling in this course, I hereby affirm that I will not under any circumstance make a recording in any medium of any one-on-one meeting with the instructor without obtaining the prior written consent of all those participating, and I understand that if I violate this prohibition, I will be subject to discipline by Dartmouth up to and including expulsion, as well as any other civil or criminal penalties under applicable law.

NOTE on the Course Schedule: The dates below are listed to help you manage your time and workload. Remember, all lectures and Stata labs will be delivered in person, but you have access to the slides and other materials on Canvas at the beginning of the week. Remember that problem sets are not to be turned in, so the due dates on the schedule are there to remind when they should be completed. Let's take the first week as an example. We will cover the first two chapters during the week, and you should be reviewing the slides and working on the problem set for Ch. 1-2. By Monday (9/21) you should have completed the first problem set and ready to turn your attention to the second one on Ch. 3-4. It is always good practice to start early so that you can come to me (or Jianjun) with questions.

Course Schedule
(Syllabus is subject to change with advanced notice)

Date	Topic	Textbook/ Lectures	Due Dates
M, 9/13	Course Introduction		
W, 9/15	The Research Process	Ch. 1	
F, 9/17	Basic Descriptive Statistics; Intro Stata Lab	Ch. 2	
M, 9/20	Measures of Central Tendency	Ch. 3	Prob Set #1 (on Ch 1-2)
W, 9/22	Measures of Dispersion	Ch. 4	
F, 9/24	Stata Lab		
M, 9/27	Exam Prep/Review		Prob Set #2 (on Ch 3-4)
W, 9/29	**Exam #1**		
F, 10/1	The Normal Curve and *Z*-scores	Ch. 5	
M, 10/4	Stata Lab		Group Project Assignment #1 Due
W, 10/6	Sampling Distributions	Ch. 6	Prob Set #3 (on Ch 5)
Th, 10/7 (X)	Catch up; Work on problem sets/practice		
F, 10/8	Confidence Intervals	Ch. 7	
M, 10/11	Stata Lab		
W, 10/13	Hypothesis Testing (Two-Sample Tests)	Ch. 9	Prob Set #4 (on Ch 6-7)
Th, 10/14 (X)	Catch up; Practice/Group project workshop		
F, 10/15	Stata Lab		
M, 10/18	Exam Prep/Review		Prob Set #5 (on Ch 9)
W, 10/20	**Exam #2**		
F, 10/22	Analysis of Variance (ANOVA)	Ch. 10	Group Project Assignment #2 Due
M, 10/25	Chi-Square Test	Ch. 11	
W, 10/27	Stata Lab		
Th, 10/28 (X)	Bivariate Correlation	Ch. 13	Prob Set #6 (on Ch 10-11)
F, 10/29	Group Project Workshop		

M, 11/1	Bivariate Regression	Ch. 13	Group Project Assignment #3 Due
W, 11/3	Multivariate Analysis	Ch. 15	
Th, 11/4 (X)	Stata Lab		
F, 11/5	Interpreting Multiple Regression (Elaboration)		See slides and handouts on Canvas
M, 11/8	Final Homework Assignment Workshop		
W, 11/10	Group Project Workshop		Final Homework Assignment Due
F, 11/12	Group Project Workshop		
M, 11/15	No Class (Finish Report)		
T, 11/16	**Group Final Report Due (11:59pm EST)**		