

Quantitative Analysis of Social Data

SOCY 10—Fall 2019

Course meets in Room 006, Kemeny Hall

Professor: Kristin Smith

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Office: 301B Blunt Hall

10A, T/TH 10:10-12

X-period: W 3:30-4:20

Office hours: T/TH 12:15-1:30PM

Wednesdays, by appointment only

STATA help: Jianjun Hua Jianjun.Hua@Dartmouth.edu

Email Jianjun to schedule an appointment

Course description:

Every day we hear statements in the media citing statistics like:

Americans are more worried than ever about the economy.

Teens in families that eat dinners together have a lower risk of drug use.

Schools with smaller class sizes have better outcomes.

Youth who grow up in good neighborhoods are more likely to go to college.

Where do these statements come from? If someone else has conducted a study, how can you tell whether to trust the results? How would you test these hypotheses using quantitative data? What are the appropriate techniques to use for the analysis?

This course provides an introduction to basic statistical techniques used by researchers to investigate social, economic, and political phenomena. The statistical techniques you will learn are really just tools to effectively organize data and present information 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 grow up in impoverished communities have better or worse health than those who did not?”

“Are birth defects related to local levels of water pollution?”

“Is a history of depression associated with premature death?”

“Does getting a college degree have the same labor market benefits for blacks and whites?”

“Is student loan debt leading the current generation of young adults to forgo marriage and childbearing?”

By the end of this quarter, 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, not to test your mathematical abilities. The emphasis of the class is on understanding the concepts and appropriate uses of quantitative methods rather than deriving and memorizing the formulas. A rudimentary familiarity with basic arithmetic and a few algebraic functions will suffice for material presented in the course. More than anything, success in this course requires diligence. The material covered in the course is very incremental, with the presentation of new material building on what you learn in earlier segments of the course. You will have the greatest chance of success if you attend class regularly, take meticulous notes, keep up on your reading, and make sure to visit office hours to get clarification on issues about which you are unsure. I reserve the right to use X hours as an impromptu review session if we feel that some issues need further clarification.

Course Readings

Textbooks:

There is one required textbook which can be purchased from the Dartmouth Bookstore or Wheelock Books. It is also on reserve in Baker/Berry library.

Required Text

Healey, Joseph. 2014. *Statistics: A Tool for Social Research*, 10th edition. Stamford, CT: Cengage.

*I recognize that the latest edition of this book is relatively expensive. Thus, you are welcome to purchase a previous edition of the book at a reduced cost. That said, you are responsible for the material covered in Healey 2014. If you encounter financial challenges related to this class, please let me know.

Below is a list of optional texts that you may find useful to have on your bookshelf. I will be drawing from these readings (and will occasionally assign chapters on Canvas) throughout the course.

Optional Texts:

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.**

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 Us Jobs, Justice, and Lives*. Ann Arbor: University of Michigan Press

For a good application of statistics to everyday life, I highly recommend that you add these blogs to your daily reading:

Family Inequality (Phil Cohen): <http://familyinequality.wordpress.com/>

Five Thirty Eight (Nate Silver et al.): <http://www.fivethirtyeight.com/>

Vox (Ezra Klein et al.) www.vox.com

The Upshot (NYTimes) <http://www.nytimes.com/upshot/>

Wonkblog (WaPo): <http://www.washingtonpost.com/blogs/wonkblog/>

Statistical Modeling, Causal Inference, Social Science (Andy Gelman)

<http://andrewgelman.com/>

Statistical Software and Electronics

We will be using STATA 15 for in-class demonstrations, problem sets, and the final project. STATA is available for free on the Dartmouth Network (Mac/PC) and is also available on most public computers on campus. For more information on STATA resources and installing STATA on your computer, see the following websites:

<http://tech.dartmouth.edu/its/services-support/help-yourself/knowledge-base/software>

MAC: <http://tech.dartmouth.edu/its/services-support/help-yourself/knowledge-base/stata-macintosh-os-x>

PC: <http://tech.dartmouth.edu/its/services-support/help-yourself/knowledge-base/stata-windows>

Please use these resources and the helpdesk for any installation questions.

In most classes, we will be using STATA in order to demonstrate statistical techniques. This will generally occur for the last 35 minutes of class every day. For this reason, you are encouraged to bring your laptop to class to use during the second half of class so that you may follow along.

A brief note on STATA: Learning a new statistical analysis program and programming language is **hard**. To be successful at learning something new, you must practice outside of class to hone your skills. There are many ways for you to get help with STATA: You may ask another student for help with STATA, or ask Juanjun Hua, or come see me during office hours with STATA related questions. In addition, here are some resources that will help you as you learn to code in STATA:

Jianjun Hua's research guides

<http://researchguides.dartmouth.edu/content.php?pid=316205&sid=2587562>

UCLA Stata Resources
<http://www.ats.ucla.edu/stat/stata/>

Princeton Stata Resources:
<http://data.princeton.edu/stata/>
<http://dss.princeton.edu/training/StataTutorial.pdf>
http://dss.princeton.edu/online_help/stats_packages/stata/

You will also need to have a calculator to complete your assignments and exams, and to participate in in-class exercises. A basic and inexpensive calculator that has square-root and squaring functions is best for use in this class. Make sure to bring your calculator to class every day and to all exams. You are not permitted to use cell phone calculators for exams, but you are welcome to use them during regular class periods.

Study group

The Academic Skills Center is arranging a study group for this class. This is a great resource for students who are less confident in the class. If you are interested in joining the study group contact the Skills Center.

Course Requirements

Exams (20% each). There will be three exams during the course of the term. The exams are not open book. For exams, students are permitted to bring in one *hand-written* 8.5x11 sheet of paper (front and back) with notes and equations. Other materials that will be needed during the exams (such as a copy of the standard normal table) will be provided by the instructor when applicable. For Exams 1 and 2, you will be allotted 65 minutes to complete the exam. For Exam 3 you will be allotted 120 minutes to complete the exam.

Group Project (Paper and Presentation 40%). Students will be required to complete a group project, which includes a paper and a presentation. The group project is one of the most important, and perhaps the most rigorous aspect of this course. See the description in Canvas. These projects will require a significant time commitment, so it's important to choose a topic that you're excited about and get started 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, with the 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:	10%
Group Project Assignment 3:	10%
Final Presentation*:	15%
Final Paper:	60%

**attendance is required for all final presentation dates*

Problem Sets (0%). There will be 7 ungraded problem sets assignments this term. For each problem set, I will designate which questions you are required to answer – the rest of the problems can be viewed as practice problems, completed on your own time. Hard copies of your problem sets will be due at the beginning of class on the date indicated in the Course Schedule. **Assignments must be handed in at the beginning of the class period—do not email them to me.** For all problem set assignments (with the exception of HW#1) you will need to turn in your STATA output (LOG files and DO files). Answers to the STATA portions of the assignment should be typed, preferably in the .do file, and should be easily separable from the hand calculations portion of the homework (i.e., both sections will be turned in together but will resemble two separate assignments).

Students are welcome to work together and help each other on problem sets, **but each person MUST turn in their own assignment and provide answers in their own words.** Assignments will be posted on Canvas by Tuesday of the week before they are due (at the latest). If you did work with someone, please put their names at the end of your homework. I will post answer keys for each problem set by 5 pm on the day that they are due so you can check your work. You should be completing the problem sets (and checking your work) to make sure you are keeping up with the material.

While your problem sets are ungraded, I will collect problem sets and mark for completion. **I will deduct 3 points from your most recent exam score for each problem set you do not hand in. The late policy for problem sets (see below) applies. I will not grade problem sets turned in more than 48 hours after the original due date.**

I will use the following scale in assigning grades:

95%-100%: A	92%-94.9%: A-	89%-91.9%: B+
83%-88.9%: B	80%-82.9%: B-	77%-79.9%: C+
73%-76.9%: C	70%-72.9%: C-	60%-69.9%: D
Below 60%: E		

Please note the following about grades: 1) I do not round grades; 2) I **do not negotiate final grades** unless an error was made.

The final grade will be determined based on the following weighting scheme:

- Exams: 60% (20% each)
- Group project: 40% (paper, presentation, and three assignments)

Course Guidelines and Policies

Course attendance:

Although class attendance and participation are not part of your final grade, students who attend class regularly tend to do better in this course. I assume that you are serious about your commitment to this class and thus presume that missed classes are due to a good reason (you are very sick, you are caring for someone who is very sick). In the event that you miss a class for

any reason, you are responsible for getting class notes from another student. As a general policy, I do not make my notes available. After you review your classmate's notes, I would be happy to meet with you to talk about the material or answer questions about anything that is unclear.

Exceptions: If your absences become chronic or you anticipate missing several classes, then it is time to consult with me. All students are required to attend class for group presentation days.

Honor principle:

Examinations and assignments will be conducted in accord with the principles of academic honor detailed in the Dartmouth Organization, Regulations and Courses. Academic misconduct will result in a failing grade and a report to your academic dean. Students are encouraged to read Dartmouth's statement on Sources and Citations: <http://www.dartmouth.edu/~writing/sources>

Religious holidays:

Some students may wish to take part in religious observances that occur during the academic year. If you have a religious observance that conflicts with your participation in the course, please meet with me as soon as possible to discuss appropriate accommodations.

Students with disabilities:

Students with learning, physical, or psychiatric disabilities who will be taking this course and may need disability-related classroom accommodations are encouraged to make an appointment to see me as soon as possible, by the end of the second week of classes. Students requiring disability-related academic adjustments and services must consult the [Student Accessibility Services office](#) (Carson Hall, Suite 125, 646-9900). Once SAS has authorized services, students must show the originally signed SAS Services and Consent Form and/or a letter on SAS letterhead to their professor. As a first step, if students have questions about whether they qualify to receive academic adjustments and services, they should contact the SAS office. All inquiries and discussions will remain confidential.

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/>).

For individual peer tutorial assistance with papers, research, and new media projects, students may use RWIT, the Student Center for Research, Writing, and Information Technology. Make appointments online at www.dartmouth.edu/~rwit, or drop by the Center at Baker-Berry Library, Level One, from 4 to 6PM and 7 to 10PM, S-Th.

Late submissions and make-up exams:

The submission of assignments, exams and papers is expected on the indicated "due date" at the beginning of that day's class meeting (unless otherwise stated). On any assignment, your grade will be reduced by 8 percentage points for each day late (e.g., 1 day late, a grade of 100 will be reduced to a 92; 2 days late, 84; and so on). Assignments that are more than 5 days late will not

be graded and will receive a 0. Given that assignments are posted far in advance, no exceptions to the late policy will be made, including for planned and unplanned absences.

Problem sets turned in after the first 10 minutes of the class period in which it is due will result in a 1 percentage point reduction in the most recent exam; 2 days late results in 2 percentage point reduction. I will not accept problem sets turned in later than 48 hours after the original due date, and this will result in a 3 percentage point reduction in your most recent exam score.

There will be no make-up exams except in extremely rare cases in which some unforeseen crisis or emergency arises. If you know ahead of time that you have a conflict with the exam schedule, discuss this with me as soon as possible to make arrangements for the exam. If the make-up exam is missed ***for any reason*** the student will receive a zero for the exam.

Also note that computer failure is never considered a justifiable excuse for a paper extension. Computers sometimes freeze or breakdown; power outages happen. The best way to deal with these possibilities is to **save your work, and save often.**

Classroom etiquette:

Disruptions to class negatively affect everyone's ability to learn. Everyone should arrive to class on time and not leave early. If you must arrive late or leave early, please notify the instructor in advance and sit by the door to minimize disruptions. **It is inappropriate to use cell phones or use laptops for activities outside of taking notes (such as email, facebook, shopping, etc.).** Sidebar discussions with fellow students are disruptive to the professor. Students will be offered a short break (5 minutes) during the course. Students should respect the time frame and return to class within the time allotted.

Course Schedule

This syllabus is a working document; it may change over the course of the term. You are advised to check the Canvas Website regularly for changes.

Class	Topic	Readings	Assignment Due Dates
Tu 9/17	Course Introduction		
Th 9/19	The Research Process; Working with and displaying data	Healey Ch. 1 Healey Ch. 2	
Tu 9/24	Measures of Central Tendency	Healey Ch. 3	HW #1 Due
W 9/25	X Hour: Introduction to STATA		
Th 9/26	Measures of Dispersion STATA LAB	Wheelan Ch. 2(CV); Healey Ch. 4	
Tu 10/1	Normal Curve and Z scores STATA LAB	Healey Ch. 5	HW #2 Due
W 10/2	X Hour: Optional Exam Review Session		
Th 10/3	Normal Curve and Z Scores Wrap Up Section I; Exam Review		Group Project Assignment 1 Due
Tu 10/8	EXAM 1		
Th 10/10	Intro to Sampling; Confidence Intervals STATA LAB	Healey Ch. 6; Healey Ch. 7	
Tu 10/15	Intro to Hypothesis Testing STATA LAB	Healey Ch. 8	HW #3 Due
Th 10/17	Two Sample Hypothesis Testing STATA LAB	Healey Ch. 9	Group Project Assignment 2 Due
Tu 10/22	Two Sample Hypothesis Testing STATA LAB		HW #4 Due
Th 10/24	Analysis of Variance STATA LAB	Healey Ch. 10	
Tu 10/29	Chi-Square STATA LAB	Healey Ch. 11	HW #5 Due
W 10/30	X Hour: Optional Exam Review Session		
Th 10/31	EXAM 2		
Tu 11/5	Correlation STATA LAB	Healey Ch. 13; Wheelan Ch. 11 (CV)	HW #6 Due
W 11/6	X Hour: STATA help for Group Project		

Th 11/7	Bivariate Regression; STATA LAB	Healey Ch. 13	Group Project Assignment 3 Due
Tu 11/12	Multivariate Analysis STATA LAB	Healey Ch. 15 Wheelan Ch. 12 (CV)	HW #7 Due
W 11/13	X Hour: STATA help for Group Project		
Th 11/14	Group Presentations		
Tu 11/19	Group Presentations		
W 11/20	X Hour: Optional Exam Review Session		
Exam #3 During Final Exam Week: Monday 11/25, 3pm (Room TBA) Final Group Project Papers Due Friday 11/22 by 3pm			

****NOTE:** We do not have the time to cover Healey Ch 12 or 14, though I recommend you read these chapters on your own; CV=Reading on Canvas