

GOVT 10: Quantitative Political Analysis

Prof. Brendan Nyhan

Office: 122 Silsby

Office hours: TTH 9–10 AM, 1:30–2:30 PM

Email: nyhan@dartmouth.edu

Classroom: Moore 202

Schedule: MWF 10:10–11:15 AM

x-period: Thurs. 12:15–1:05 PM

Course overview

Political scientists frequently use quantitative methods to study elections, legislatures, wars, and other important political phenomena. This course provides students with an introduction to fundamental concepts in statistical analysis, research design, and causal inference as well as contemporary examples of how those concepts can be applied in the real world. The goal is to enable students to not only become sophisticated consumers of quantitative research in political science but to enable them to conduct their own research using computerized data and software and to effectively present the results to others using tools and ideas from the course. There are no formal prerequisites for this course.

Learning objectives

By the end of the course, you should be able to do the following:

- Apply concepts from probability theory to social science research questions
- Make inferences about population means and proportions from samples
- Correctly conduct and interpret hypothesis tests and p -values
- Accurately summarize data using graphs and descriptive statistics
- Identify key concerns in survey sampling and causal inference
- Understand linear regression in theory and practice
- Conduct statistical analyses using Stata (or R)
- Design an experiment, analyze the data, and interpret the results (group)

Team-based learning

This course will feature a modest amount of traditional lecturing split between asynchronous videos posted before class and short mini-lectures at the beginning of class devoted to topics or concepts that students have need more help to understand. Students will be expected to complete course readings before class so that the majority of our time together can be dedicated to discussion, group

work, and hands-on demonstrations, which are more likely to facilitate successful learning. We will work virtually in teams throughout the quarter to maximize active engagement with the course material. By working in teams, students will not only develop communication and collaboration skills but assist each other in understanding and applying concepts successfully. Early in the quarter, you will be assigned to a team of 4–5 students. You will work with this team throughout the quarter on both in-class assignments and your final research project. To ensure that each student contributes to the group's success, your contributions will be assessed via the self- and peer-evaluation components discussed below.

Slack for class discussion

Students have many questions when learning about statistics and using statistical software for the first time. You can of course always email me privately, come to office hours, etc., but we will use the Slack messaging app so that you can learn from each other as well as from my answers to other people's questions. Please join the course workspace from Canvas. I will answer questions about the lectures, homework, quizzes, etc. there and also use it to communicate with student groups.

Course materials

The following texts are required. They can be purchased or rented online.

- Alan Agresti. *Statistical Methods for the Social Sciences*. 5th edition. Pearson.
- Ethan Bueno de Mesquita and Anthony Fowler. *Thinking Clearly with Data: A Guide to Quantitative Reasoning and Analysis*. Princeton University Press.

Other resources

I recommend two other free online resources to supplement Agresti:

- [The OpenIntro Statistics textbook](#) is freely downloadable in PDF format if you want another take on the material in Agresti
- [Khan Academy probability and statistics videos](#) also covers many of the same topics if you'd like to see the material presented in lecture form in an alternate manner

Calculator use

You will need to borrow or purchase a calculator to use in this course during group and individual work on problem sets and exams. I recommend a graphing calculator (any model). While the graphing features are not necessary, that type of calculator will allow you to type in long equations and to store calculated

values, which are both very helpful in calculating answers to problem set and exam questions without making rounding errors (or worse).

Statistical software

We will use Stata statistical software in this course, which is freely available to students. Please install Stata 16 and the KeyAccess app on your computer and verify that you can run it successfully as soon as possible.

Installing Stata 17 for Mac:

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

Installing KeyAccess for Mac:

<https://services.dartmouth.edu/TDClient/1806/Portal/KB/ArticleDet?ID=64844>

Installing Stata 17 for Windows (includes KeyAccess):

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

Please note that some people have had trouble installing Stata in the past, so please make sure to do it as soon as you can so you can get help before the first Stata workshop if you run into problems. If you have trouble getting Stata installed, please contact the [ITC Service Desk](#) (note: it is closed Dec. 20–Jan. 2). You should have Stata working on your computer and ready to use before the tutorial that I will conduct on January 6. Please bring your computer to class on that day.

Also, you must be connected to the Dartmouth network via Ethernet, WiFi, or the VPN to install and use Stata and KeyAccess. If you are off campus, you will first need to [sign on to the VPN](#). (If doing so is not feasible, see [this article](#) for other options.)

To learn how to correctly set your working directory and open data in Stata, please consult the guide provided at the end of this syllabus. If you have additional problems, please consult the following resources:

1. Consult this excellent Stata cheat sheet, which I recommend keeping on hand: http://geocenter.github.io/StataTraining/pdf/StataCheatsheet_processing.pdf
2. Stata help — Simply type “help <command>” for any Stata command in the command window and the help file for that command will appear. For more help, click on the linked title of the help file (e.g., “[R] summarize”) to open a PDF of the relevant section of the Stata manual. The manual provides more extensive discussion and examples in the “Remarks” section, which appears below the text from the online help file.

3. Type your specific question, problem, or error message into Google. Someone has likely asked a similar question in the past. Sites such as Stack Overflow (<https://stackoverflow.com/questions/tagged/stata>), a question and answer site for programmers, contain answers to many basic, intermediate, and advanced questions. Your ability to search for and find answers to these questions independently is an important but often unrecognized component of learning a statistical programming language.
4. Consult the sample `.do` file on Canvas, which demonstrates a variety of useful commands with correct syntax, including how to tabulate, summarize, and graph data and perform various statistical tests and analyses. (It will be especially useful for your group research project.)
5. Consult Jianjun Hua, our statistical consultant for GOVT 10, by email at Jianjun.Hua@dartmouth.edu or make an appointment to meet with him.
6. Contact me by email at nyhan@dartmouth.edu or make an appointment to meet with me. When you do, please send a precise description of your problem along with your data, `.do` file, and a screenshot or Stata output, which help me more quickly diagnose the problem.

I have included links to YouTube video tutorials explaining specific Stata features you will need in the course assignments below. For general help learning Stata, see the [Stata tutorials](#) and [Stata refresher](#) resources here at Dartmouth. [UCLA's Stata resources site](#) is also helpful. Finally, see also the [Stata YouTube channel](#) for demonstration videos. (Students who want a more detailed guide to Stata usage might wish to consult *A Stata Companion to Political Analysis* by Philip H. Pollock III and Barry C. Edwards or *A Gentle Introduction to Stata* by Alan C. Acock.)

Note: Students who wish to do so may use R instead. It is both [freely available online](#) and more commonly used in statistics, quantitative social science, and industry than Stata (outside of economics!). The learning curve is steeper, however, and your instructor is less skilled at using it, so anyone who chooses this path should be prepared to troubleshoot errors on their own.

Studying

Many students do not study effectively. I highly recommend [Vox's guide](#) to improving how you prepare for exams. For more information, please contact the [Academic Skills Center](#).

Office hours

Office hours are designated times that faculty members set aside each week specifically for students to ask questions about the course material or college in general on a one-on-one basis. Many students come to office hours to ask about

how to prepare for upcoming exams or what they could have done better on past exams. I'm very happy to talk about both topics, of course, but I would also encourage you to bring substantive questions about the course material that come up in your reading or writing where I might be able to help you understand a concept or assist you in developing or expressing an idea.

My office hours are Tuesday and Thursday from 9–10 AM and 1:30–2:30 PM. Please schedule an in-person or virtual meeting with me using my ScheduleOnce page at <https://go.oncehub.com/nyhan>. (If you cannot meet with me during any of those times, please email me to request an alternate time.)

Tutoring groups

Tutoring Groups will be offered for this class by the Tutor Clearinghouse, a program of the Academic Skills Center. To learn more about how Group Tutoring works, please visit the [Tutor Clearinghouse website](#). [Registration](#) will begin the end of week 2. Details will be available at the registration site.

Student wellness

I recognize that the academic environment at Dartmouth is challenging, that our terms are intensive, and that 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](#), [Counseling and Human Development](#), and the [Student Wellness Center](#). I encourage you to use these resources and to speak with me if you have concerns.

Assignments and grading

Grading in this class will be based on the components described below. I know that the COVID-19 pandemic and remote learning create difficult challenges for many students. Please reach out to me immediately if you have problems or concerns that will interfere with your ability to complete these successfully.

Participation in class and on Slack – 5%

We all learn best when we are actively engaged. To encourage you to do so, a small portion of your grade will be determined by participation. I recognize, however, that students vary in their level of comfort with different types of participation. Participation will therefore include comments and questions during class as well as on Slack, the group messaging app we will use in the course. I encourage you to answer questions there from other students and to post questions and comments there that are related to the course as well.

Peer assessments – 5%

To help ensure that each team member is actively contributing to their group's success, students will be asked to anonymously evaluate their teammates' con-

tributions, effort, and performance. You will receive ungraded midterm evaluations from your group to help you know how well you are doing and identify areas in need of improvement. You will also complete a midterm self-evaluation of your own contributions, effort, and performance using an identical form to help you reflect on your own effort and performance. The text of all peer and self-evaluation forms are provided at the end of the syllabus. Please download electronic versions of each form from Canvas and submit them on Canvas by the appropriate deadlines. I will drop the lowest peer evaluation that you receive.

Problem sets, in-class work, and quizzes – 30%

Problem sets will be assigned throughout the course (20%). These are individual assignments that you should prepare yourself. If needed, you may ask a colleague for help on concepts or strategies for solving a particularly difficult problem, but **you must independently complete the assignment, submitting an assignment written in your own words with your own calculations.**¹ Copying answers from the Internet or other students is not acceptable and will constitute a violation of the Academic Honor Principle. As always, please ask me if you have any questions or concerns about this policy. All problem sets should be submitted on Canvas using Gradescope with only your ID number (i.e., not your name). They are due 30 minutes before class begins. For instructions on how to submit your work to Gradescope, see <https://help.gradescope.com/article/ccbpppzi9>. For instructions on how to scan your work using your mobile device, see <https://help.gradescope.com/article/0chl25eed3-student-sscan-mobile-device>. For questions using Stata, you should make sure to include the relevant Stata code and output (graphs you make, results from the results window, etc.) as appropriate. Each student's two lowest problem set grades will be dropped in final grade calculations.

Individual preparedness assessments (IPAs) are open book multiple-choice quizzes that will be administered on Canvas before each class (5%). These are designed to ensure that students arrive to class prepared to engage in discussion and team activities based on the assigned reading. (Many in-class team activities will be graded, so these assessments are necessary to ensure that all members are ready to contribute.) You should complete these assessments yourself with no assistance from your colleagues; you may not discuss them with other students prior to class. Each student's four lowest IPA grades will be dropped in final grade calculations.

Note: IPAs are set to become available on Canvas after the prior class session ends and to remain available until 15 minutes before the beginning of the class whose content they cover. Each IPA is five minutes long and consists of up to five multiple-choice or multiple-answer questions. You must complete them in

¹For example, you could help an elementary school student struggling with $\frac{3}{4} + \frac{5}{8}$ that they should think about finding a common denominator. But telling them the answer or showing them your solution would not be acceptable.

one sitting after doing the reading and watching any assigned videos; they may not be paused or retaken and they will automatically be submitted when the time limit expires. The IPAs cannot be returned to preserve the integrity of the quizzes for future classes but we will review the questions and answers during class to ensure that students have learned the material.

In-class assignments will be completed during class with your research team (5%). All members turn in a single assignment and will share the grade on it. The problems should be submitted in the order they were assigned. However, **absent students do not receive credit for group work completed in classes that they missed** unless they have an excused absence due to illness. Each student's two lowest in-class assignment grades will be dropped in the final grade calculations.

Midterm exam – 15%

The midterm exam will be held during class on February 10 and will cover the material addressed in class to that point. Students will be provided with relevant statistical tables and are allowed to use a calculator with no information stored in memory. The exam will be open book and open note but you may not collaborate or communicate with anyone else while completing the exam. All Dartmouth academic integrity rules of course apply. If you have any questions about these rules, please contact me immediately. (Note: The exam will be curved! Don't panic about your raw score.)

Research project – 20%

Working with an assigned team, students will select a social science research question of interest, design and execute an experiment testing a hypothesis about that question (most likely using the Qualtrics survey research platform at <http://dartmouth.qualtrics.com>, which will easily allow you to design a randomized experiment — see the guide to using it and project suggestions provided at the end of the syllabus), and conduct a quantitative analysis of their results. These findings will be written up as scientific presentations that you will share in a virtual online event during our March 8 session. You may include up to ten slides that you should create collaboratively in Google Slides or Office 365 PowerPoint. These can include supporting text in the speaker notes to back up what's shown to your audience or provide more details. Each group must download and submit their slides, the survey design from Qualtrics (Tools → Import/Export → Export survey to Word; make sure to select the option to include the Survey Flow) and any other relevant study materials, a working link for the survey, and replication data/annotated Stata code generating your results to me on Canvas before the March 8 class period begins. Each member of the group which Govt. Dept. faculty select as having created the best project will receive 1% extra credit toward their overall course grade. Note: Don't worry about whether your hypothesis was supported! Evaluation will be

based on the criteria specified in the rubric at the end of this syllabus, not the statistical significance of your results. (Your contribution to the project will be assessed using self- and peer-evaluations as specified above.)

Project timeline:

- Research proposal (1/28)
- Revised proposal (2/7)
- Experimental design/materials draft (2/18)
- Preliminary results/poster (3/2)
- Poster presentation (3/4)

Final exam – 25%

A comprehensive final exam will be held at the time determined by the college (March 12, 11:30 AM). Students will be provided with relevant statistical tables and are allowed to use a calculator with no information stored in memory.

Prerequisites

The course has no prerequisites.

Academic integrity

Students are responsible for understanding the [academic integrity rules](#) at Dartmouth, including [how to cite sources appropriately](#). Ignorance of the Academic Honor Principle or appropriate citation practices will not be considered an excuse if a violation occurs. In particular, please do *not* consult problem set solutions found online — doing so is an Academic Honor Principle violation. Please see me immediately if you have any questions or concerns. Specific details on rules for homework, exams, and group work are listed elsewhere in the syllabus.

Students with disabilities

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; 603/646-9900) and to request that an accommodation email be sent to me in advance of the need for an accommodation. Students should then schedule a follow-up meeting with me as soon as possible 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. (Students with disabilities who require an exception to the laptop policy described above will be granted one; please let me know if we need to discuss this option.)

Religious observances

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, please meet with me as soon as possible (before the end of the second week of the term at the latest) to discuss appropriate accommodations. Dartmouth has a deep commitment to support students' religious observances and diverse faith practices.

Course schedule

The tentative schedule for the course is presented below. Please note that certain classes have been replaced with x-periods due to holidays. This course outline is subject to change; please consult the current version of the syllabus on Canvas for the most up-to-date information. In particular, additional readings may be added that are relevant to the material being covered.

Introduction to GOVT 10 (1/5)

- Texts should be in hand (rent, buy, etc.) *before* class
- Install Slack
- Bueno de Mesquita and Fowler, Ch. 1
- Take introductory survey to help me learn about you (http://tuck.qualtrics.com/jfe/form/SV_dojNJ9728YDhtwF)
- Take anonymous survey for group formation (http://tuck.qualtrics.com/jfe/form/SV_8vHhJk1Xopdl5Lo)

Stata tutorial (1/7)

- Install Stata
- Stata YouTube videos on the program interface (<https://www.youtube.com/watch?v=EhqzAzr5ThI>), help system (<http://youtu.be/UpXNMeTzmuI>), and how to import data in Excel (http://youtu.be/N5ZFgzN2_7c) and text delimited formats (<http://youtu.be/60REBNsqzL6I>)
- Germán Rodríguez, “Stata Tutorial: Introduction” 1.1–1.2.6 (<http://data.princeton.edu/stata/>)
 - Goal: Run each of the code snippets Rodríguez presents from the command window in order while following along in the article. If possible, try also to make and run the full sample `.do` file included at the end of the tutorial.

Measurement and data collection (1/10)

- Agresti: 1.1–1.4, 2.1–2.3
- AAPOR task force, “2020 Pre-Election Polling: An Evaluation of the 2020 General Election Polls” (<https://www.aapor.org/Education-Resources/Reports/2020-Pre-Election-Polling-An-Evaluation-of-the-202.aspx>)
- Bueno de Mesquita and Fowler, Ch. 16

Descriptive statistics (1/12)

- Agresti: 3.1–3.4, 3.6–3.7
- YouTube videos: “Descriptive statistics in Stata” (<http://youtu.be/kKFbnEWwa2s>), “Basic scatterplots in Stata” (<http://youtu.be/GhVGpe31b3E>), “Histograms in Stata” (<http://youtu.be/nPqNZVToGx8>), “Bar graphs in Stata” (<http://youtu.be/jNjAdtQwW6M>), and “Box plots in Stata” (<http://youtu.be/y6dngL80xuo>)
- HW 1 due: Agresti 1.2, 1.4, 1.6, 1.8, 1.11, 1.16, 2.2, 2.22. For 1.11 and 2.22, use the Students data file that can be downloaded from <http://www.stat.ufl.edu/~aa/smss/data/Stata/Students.dta>. The homework file you submit should your `+.do` file and output from the Stata results window showing you loaded the data successfully for 1.11 and tabulated or summarized the relevant variables using the `tab` or `su` commands, respectively, for 2.22. (Note: the variable `subject` in the Students dataset represents an identifier number for participants, not a topic like math or science.)

Probability (1/14)

- Agresti: 4.1–4.2
- Gonick and Smith: 30–45, 53–63 (Canvas)
- Bernd Beber and Alexandra Scacco, “The Devil Is in the Digits” (<https://www.washingtonpost.com/wp-dyn/content/article/2009/06/20/AR2009062000004.html>)

Normal distributions (1/19)

- Agresti: 4.3 (excluding the section on bivariate probability distributions starting on page 79)
- Optional: Khan Academy, “Normal distributions and the empirical rule” and “Normal distribution calculations” (<https://www.khanacademy.org/math/statistics-probability/modeling-distributions-of-data>)
- HW 2 due: Agresti 2.26, 2.38, 3.4, 3.6b/c (use <http://www.stat.ufl.edu/~aa/smss/data/Stata/OECD.dta>), 3.8, 3.16, 3.24b/c, 3.54 (use <http://www.stat.ufl.edu/~aa/smss/data/Stata/Students.dta>)

Sampling distributions (1/20 — x -period)

- Agresti: 4.4–4.7
- Optional: Khan Academy, “Sampling distributions” (<https://www.khanacademy.org/math/statistics-probability/sampling-distributions-library>)
- HW 3 due: Agresti 4.1, 4.4, 4.8, 4.12, 4.18, 4.22, 4.24

Confidence intervals I (1/21)

- Agresti: 5.1–5.3
- Assignment: Research proposal due on Canvas 2/3
- HW 4 due: Agresti 4.30, 4.32b/c, 4.34, 4.36a/b/c

Research projects/confidence intervals II (1/24)

- Review Agresti: 5.1–5.3
- Optional: Khan Academy, “Confidence intervals and the margin of error” (<https://youtu.be/hlM7zdf7zwU>; corresponds to 5.2)

Hypothesis tests I (1/26)

- Agresti: 6.1–6.2
- YouTube videos: “One-sample t-test in Stata” (<http://youtu.be/HwzCyqW-0dc>), “t-test for two independent samples in Stata” (<http://youtu.be/by4c3h3WXQc>), and “t-test for two paired samples in Stata” (<http://youtu.be/GiDSnufmZgI>)
- HW 5 due: Agresti 5.4, 5.8, 5.12, 5.16, 5.20, 5.22, 5.26, 5.28, 5.29, 5.30 (for part b, explain your reasoning and then analyze the data directly in Stata using <http://www.stat.ufl.edu/~aa/smss/data/Stata/Students.dta>)

Hypothesis tests II (1/28)

- Agresti: 6.3
- Optional: Khan Academy, “Significance tests (hypothesis testing)” (<https://www.khanacademy.org/math/statistics-probability/significance-tests-one-sample>)
- Research proposal due 1/28 at 5 PM ET (submit on Canvas)

Statistical inference with hypothesis tests (1/31)

- Agresti: 6.4–6.5
- Bueno de Mesquita and Fowler, Ch. 7
- Christie Aschwanden, FiveThirtyEight: “Science Isn’t Broken: It’s just a hell of a lot harder than we give it credit for” (<https://fivethirtyeight.com/features/science-isnt-broken/>)

Midterm exam review (2/2)

- Study!
- HW 6 due: Agresti 6.4, 6.6, 6.8a/b, 6.12, 6.14 plus Bueno de Mesquita and Fowler 7.2

Midterm exam (2/4)

- Study!
- Self and peer evaluations (Canvas) and midterm course survey must be submitted to take exam (http://tuck.qualtrics.com/jfe/form/SV_3VJ0khzj9BYWiy)

Midterm review and research project update (2/7)

- Go over midterm
- Research project update and peer review
 - Revise proposal as a group based on my feedback (due on Canvas before class)
 - Create an accessible online version of your proposal to share for peer review (e.g., a Google Doc)

Differences of means and proportions (2/9)

- Agresti: 7.1–7.4
- YouTube videos: “t-test for two independent samples in Stata” (<http://youtu.be/by4c3h3WXQc>), and “t-test for two paired samples in Stata” (<http://youtu.be/GiDSnufmZgI>)

Stata workshop and group session (2/10 x-period)

- TBD

Association and causation I (2/11)

- Agresti: 10.1–10.3
- Bueno de Mesquita and Fowler, Ch. 3
- HW 7: Agresti 7.4, 7.14, 7.20, 7.22, 7.24, 7.28

Association and causation II (2/14)

- Bueno de Mesquita and Fowler, Chs. 4, 8, 9

Linear regression I (2/16)

- Agresti: 3.5, 9.1–9.2, 9.4
- Bueno de Mesquita and Fowler, Ch. 5
- YouTube videos: “Pearson’s correlation coefficient in Stata” (<https://www.youtube.com/watch?v=o7ko844ff-g&feature=youtu.be>) and “Simple linear regression in Stata” (<http://youtu.be/HafqFSB9x70>)
- HW 8: Agresti 10.8, 10.10, 10.16 plus Bueno de Mesquita and Fowler 3.3, 4.1, 8.1a/b, 9.4a/b/c

Linear regression II (2/18)

- Agresti: 9.3, 9.5–9.6
- Research project update and peer review
 - Submit group experimental design/materials (due on Canvas before class)
 - Bring printed version to class for peer review

Multiple regression I (2/21)

- Agresti: 11.1–11.3 (ignore material on F-tests and ANOVA)
- YouTube video: “STATA Tutorials: Multiple Linear Regression” (<https://www.youtube.com/watch?v=NbSjQOn-Gss>)

Multiple regression II (2/23)

- Bueno de Mesquita and Fowler, Ch. 10
- HW 9 due: Agresti 9.2, 9.4, 9.10, 9.22a/b, 9.24a, 9.26 (use <http://www.stat.ufl.edu/~aa/smss/data/Stata/Florida.dta>), 9.38 (use http://www.stat.ufl.edu/~aa/smss/data/Stata/Guns_suicide.dta)

Interaction terms I (2/25)

- Agresti: 11.4, 13.1–13.3

Interaction terms II (2/28)

- Review Agresti: 11.4, 13.1–13.3
- Peter Loewen et al., “A Natural Experiment in Proposal Power and Electoral Success” (<http://onlinelibrary.wiley.com/doi/10.1111/ajps.12042/abstract>)
 - Goal: Understand Table 1 and Figure 1

- HW 10 due: Agresti 11.2, 11.4b/c (use <http://www.stat.ufl.edu/~aa/smss/data/Stata/Crime2.dta>), 11.8a/b (construct only scatterplots for 11.8a, not box plots or partial regression plots; use <http://www.stat.ufl.edu/~aa/smss/data/Stata/Florida.dta> to make scatterplots for 11.8a and to recreate regression results for 11.8b), 11.16, 11.19a/b (use <http://www.stat.ufl.edu/~aa/smss/data/Stata/Houses.dta>), 11.46 plus Bueno de Mesquita and Fowler 10.3

Communicating scientific results/poster working session (3/2)

- Lee Epstein and Andrew D. Martin, *An Introduction to Empirical Legal Research*, Oxford University Press, Chapters 10–11 (Canvas)
 - Submit preliminary results/poster (due on Canvas before class)
 - Bring printed version to class for peer review

Poster presentations (3/4)

- Present your research project (public event in Hinman Forum, Rockefeller Center)
- Submit final poster/data/materials (due on Canvas before class)

Final exam review (3/7)

- Study!
- HW 11 due: Agresti 11.22, 11.23 (use <http://www.stat.ufl.edu/~aa/smss/data/Stata/Houses.dta>, 13.2, 13.4a, 13.7 (use <http://www.stat.ufl.edu/~aa/smss/data/Stata/Houses.dta>), 13.8 (use <http://www.stat.ufl.edu/~aa/smss/data/Stata/Houses.dta>), 13.12a/b (<http://www.stat.ufl.edu/~aa/smss/data/Stata/Income.dta>; “no interaction” model/“interaction” model means what is on pages 391 and 392, respectively, but adjusted to include data on the Asian respondents [you will have to type these additional observations into Stata’s data editor] and a variable or variables for them in the model; for 13.12b, interpret how the findings from the interaction model differ from those of the no-interaction model but do not worry about conducting an F-test)

Final exam (3/12 — 11:30 AM, location TBD)

- Study!

Poster rubric

| Score: | 5 | 4 | 3 | 2 |
|---------------------------------|--|--|---|---|
| Introduction and theory | Precisely identifies null and alternative hypotheses and provides strong substantive and theoretical motivations for research project | Identifies null and alternative hypotheses and provides substantive and theoretical motivations for research project | Hypothesis described but null and/or alternative hypotheses not precisely or correctly specified; substantive and theoretical motivations incomplete or unconvincing | Theory incorrectly or vaguely stated; lacks appropriate substantive and/or theoretical motivation |
| Methods | Specifies all important aspects of how study was conducted in detailed and replicable fashion; convincingly motivates and defends key choices in design process | Specifies most important aspects of how study was conducted in relatively clear manner; addresses possible concerns about key choices in design process | Specifies some important aspects of how study was conducted; methods not always well-explained; does not sufficiently address possible concerns about choices in design process | Does not provide or clearly explain most important aspects of how study was conducted; lacks appropriate justification of key design choices |
| Results | Figures and tables illustrate findings in an intuitive and easy-to-understand way; text explains results precisely and without statistical errors; investigation of hypothesis thorough and detailed | Figures and tables illustrate findings reasonably clearly; textual explanations of results is clear; statistical approach largely correct and error-free | Figures and tables unappealing or poorly constructed; some imprecision or errors in textual discussion of results; hypotheses not thoroughly investigated | Figures and tables sloppy or hard to understand; text vague or incorrect; statistical errors in analysis; cursory investigation of hypotheses |
| Limitations and conclusions | Perceptive and detailed discussion of limitations of findings, potential explanations for those findings, substantive and theoretical conclusions, and possible future research | Clear and thoughtful discussion of limitations of findings, potential explanations for those findings, substantive and theoretical conclusions, and possible future research | Some useful discussion of limitations of findings, potential explanations for those findings, substantive and theoretical conclusions, and possible future research | Vague, incomplete, or unconvincing discussion of limitations, implications, and conclusions |
| Statistical analysis (poster) | Innovative use of statistical methods to answer research question; no errors in statistical analysis | Correct use of statistical methods to answer research question; no or few errors in statistical analysis | Potentially problematic use of statistical methods to answer research question; some errors in statistical analysis | Flawed use of statistical methods to answer research question; significant errors in statistical analysis |
| Statistical analysis (.do file) | Replicates poster findings exactly from original data; clear, descriptive, and precise comments; correct and error-free statistical analyses and use of Stata | Statistical analysis and Stata code are largely correct; comments relatively clear and descriptive | Some errors in statistical analysis or Stata code; failure to fully replicate poster or provide appropriate comments | Does not replicate poster; lacks comments; many statistical and/or Stata errors |
| Graphical design | Exceptionally attractive design and layout; free of formatting problems | Attractive design and layout; no or few formatting problems | Somewhat attractive poster; some formatting problems | Difficult-to-read or messy poster design; many formatting problems |
| Writing quality | Exceptionally well-written—precise, clear, and mistake-free; concise and elegant | Very well-written—clear and articulate; few or no typos; not too long | Moderately well-written; some typos; wordy or vague | Unclear, awkward, or imprecise writing; numerous typos; too long and wordy or too short and vague |

Self evaluation form (mid-quarter; ungraded)

Team #:

Your name:

Part 1: Quantitative assessment (check one box for each item)

| Cooperative learning skills | Never | Sometimes | Often | Always |
|---|-------|-----------|-------|--------|
| Arrives on time and remains with team during activities | | | | |
| Demonstrates a good balance of active listening and participation | | | | |
| Asks useful or probing questions | | | | |
| Shares information and personal understanding | | | | |

| Self-directed learning | Never | Sometimes | Often | Always |
|---|-------|-----------|-------|--------|
| Is well-prepared for team activities | | | | |
| Shows appropriate depth of knowledge | | | | |
| Identifies limits of personal knowledge | | | | |
| Is clear when explaining things to others | | | | |

| Interpersonal skills | Never | Sometimes | Often | Always |
|---|-------|-----------|-------|--------|
| Gives useful feedback to others | | | | |
| Accepts useful feedback from others | | | | |
| Is able to listen and understand what others are saying | | | | |
| Shows respect for the opinions and feelings of others | | | | |

Part 2: Qualitative assessment (1–3 sentences each)

1) What is the single most valuable contribution you make to your team?

2) What is the single most important way you could alter your behavior to more effectively help your team?

(Fill out electronic version online and submit on Canvas)

Peer evaluation form (mid-quarter; ungraded)

Team #:

Colleague you are evaluating:

Your name (evaluator):

Part 1: Quantitative assessment (check one box for each item)

| Cooperative learning skills | Never | Sometimes | Often | Always |
|---|-------|-----------|-------|--------|
| Arrives on time and remains with team during activities | | | | |
| Demonstrates a good balance of active listening and participation | | | | |
| Asks useful or probing questions | | | | |
| Shares information and personal understanding | | | | |

| Self-directed learning | Never | Sometimes | Often | Always |
|---|-------|-----------|-------|--------|
| Is well-prepared for team activities | | | | |
| Shows appropriate depth of knowledge | | | | |
| Identifies limits of personal knowledge | | | | |
| Is clear when explaining things to others | | | | |

| Interpersonal skills | Never | Sometimes | Often | Always |
|---|-------|-----------|-------|--------|
| Gives useful feedback to others | | | | |
| Accepts useful feedback from others | | | | |
| Is able to listen and understand what others are saying | | | | |
| Shows respect for the opinions and feelings of others | | | | |

Part 2: Qualitative assessment (1–3 sentences each)

1) What is the single most valuable contribution this person makes to your team?

2) What is the single most important way this person could alter their behavior to more effectively help your team?

(Fill out electronic version online and submit on Canvas)

Peer evaluation form (end of quarter)

Name/team #:

Please assign scores that reflect how you really feel about the extent to which the other members of your team contributed to your learning and/or your team's performance. This will be your only opportunity to reward the members of your team who worked hard on your behalf. (Note: If you give everyone pretty much the same score, you will be hurting those who did the most and helping those who did the least.)

Instructions: In the space below, please rate each of the other members of your team. Each member's peer evaluation score will be the average of the points they receive from the other members of the team. To complete the evaluation you should: 1) List the name of each member of your team in the alphabetical order of their last names; 2) **assign an average of ten points to the other members of your team using integers only**; 3) differentiate some in your ratings; for example, you must give at least one score of 11 or higher (maximum = 15) and one score of 9 or lower.

| Team member | Score |
|-------------|-------|
| 1. | |
| 2. | |
| 3. | |
| 4. | |

Additional feedback

Please briefly describe the reasons for your highest and lowest ratings in the space below. Note: Your comments should be descriptive, not evaluative; as clear and specific as possible; phrased in constructive terms; and focused on areas in which the student has made especially valuable contributions or could improve in the future.

Reason(s) for your highest rating(s):

Reason(s) for your lowest rating(s):

(Fill out electronic version online and submit on Canvas)

Guide to setting your directory and opening data in Stata

1. All analysis in Stata should be conducted using `.do` files, which are scripts we use to ensure that our results are replicable. Each should begin by opening the original source data (don't modify it!).

2. Your `.do` file *must* begin with the `clear` command. This will ensure that you clear the memory of Stata before opening a dataset, preventing an error that will otherwise occur if you already have data open (even if you opened the data during a previous run of the `.do` file that you are working on).

3. The `clear` command should be followed by a `cd` command telling Stata the path to the folder where your data lives, which is called the working directory (you can get the correct path by selecting the data file and choosing Get Info on a Mac from the file menu or right-clicking on a file in Windows and selecting Properties). The path should be specified as `"/users/..."` or `"C:"` depending on whether you have a Mac or PC. Type `help cd` in Stata or click the link in the help file to the manual for more. (Note: I recommend creating a GOVT 10 Stata folder for your data and `.do` files, which will help keep you organized and avoid cluttering your desktop.)

4. The CSV data files needed for the problem sets are listed above — make sure to save them to the correct directory. To open them, use the `import delimited` command, which opens non-Excel spreadsheet files that aren't in Stata format (see `help import delimited` for more). To open a Stata data file (`.dta`) that is in your working directory, use the `use` command instead. Sample code for my computer:

```
clear
cd "/Users/bnyhan/Documents/Dropbox/Quantitative Political Analysis/Outside data/"
import delimited "Iran_2009.csv"
```

or

```
clear
cd "/Users/bnyhan/Documents/Dropbox/Quantitative Political Analysis/Outside data/"
use "gdpvote.dta"
```

5. Any operations or analysis that you wish to perform should follow in the `.do` file below the code described above. Stata will run each line of the file in order.

6. The sample `.do` file provided on Canvas includes Stata code that you can easily adapt for your own analyses.

7. For more assistance, please consult the many resources listed earlier in the syllabus.

Notes on Qualtrics and general project/survey suggestions

Qualtrics notes:

- There is a great deal of information online on how to create surveys in Qualtrics that can help you get started, including webinars on “Basic Building and Distributing” (<https://www.youtube.com/watch?v=hWM1z4uBP1U&feature=youtu.be>) and “Advanced Building” (<https://www.youtube.com/watch?v=40cNAia-8Fs&feature=youtu.be>).
- Qualtrics also has very useful help files that you can find using simple Google searches. For instance, to create a new block, you would search for `qualtrics new block`, which will lead you to <http://www.qualtrics.com/university/researchsuite/advanced-building/blocks-and-block-options/about-blocks>.
- In your experiment, typically want to randomize at the block level in Qualtrics - see <http://www.qualtrics.com/university/researchsuite/advanced-building/survey-flow/block-randomization>. In the simplest version, you put the treatment condition in one block, control condition in another, and randomly present one (see instructions at link above), but this design can easily be made more complex as needed. (Note: You must have at least two blocks so that Qualtrics can randomize among them. Do not turn on “Evenly present elements” — we want a random draw for each respondent.)
- I recommend structuring your survey along these lines: a consent block with just the consent form (make sure to end survey if they say no!), a pre-treatment block with demographics questions and other covariates of interest, a randomizer sending them to one of the blocks for the experimental conditions, and an outcome measure/end of survey block.
- I recommend including invisible **timing questions** on each page in your survey (e.g., between page breaks). These will measure how long respondents spent on each page. (Note: If you want to exclude people who were going too fast, you should do so using how quickly they viewed pre-treatment items only. Excluding people based on the time they spent on the stimulus can break your experiment.)
- You can also randomize question order (see <http://www.qualtrics.com/university/researchsuite/advanced-building/blocks-and-block-options/question-randomization>) and the order of response options (see <http://www.qualtrics.com/university/researchsuite/basic-building/question-options/choice-randomization>).
- To insert an image, see <https://www.qualtrics.com/support/survey-platform/survey-module/editing-questions/rich-content-editor/insert-a-graphic/>.

- After completing your study in Qualtrics and downloading the data, you will need to process it slightly before it is ready for use in Stata. Usually the first row in a data file consists of variable names and the observations begin on the second row, but Qualtrics puts variable labels or question wording in row 2 below the variable name, which causes Stata to create a phantom observation and treat all of your variables as strings. You should create a new version of the spreadsheet, delete row 2, save the spreadsheet, and import that file (once saved) into Stata.
- To determine which randomized block was viewed by respondents in the Qualtrics data, your best bet is to look at the text for each variable in the results. The blocks should be listed as two (or more) different variables in the CSV output file that you open in Excel. If you tell it to code unseen items as -99 on the download results screen, you should most likely see 1 in the column corresponding to the block they saw and clicked through and -99 for the one they didn't. Or if they didn't click through on the block that they saw, it should be blank instead of taking a value of 1. You can then use these values to generate a treatment variable in Stata that takes a value of 1 if they were in the treatment condition and 0 if they were in the control condition (or correspondingly for more complicated designs).
- Qualtrics defaults to the rather overbearing Dartmouth theme but you can change the appearance to something more plain by selecting the "Look and feel" tab (the third option on the left sidebar under Survey; looks like a paint roller) and changing the theme to Presets and choosing Blank.
- Your data will come from Qualtrics in a form that often doesn't mean anything. For instance, if your treatment variable `qualtricstr` has the values of 1 for treatment and 4 for control, you need to make a new variable in Stata like this:

```
gen treatment=. /*missing as default*/
replace treatment=0 if qualtricstr==1
replace treatment=1 if qualtricstr==4
```

If your outcome variable starts with low values as high or in some other form that is nonsensical to analyze directly, then you need to make a new variable where the values make sense. Consider an Obama approval variable that comes in from Qualtrics as 1=approve, 2=disapprove, 3=don't know. You need to make a new variable to analyze where high values represent what the variable is called and/or means like this:

```
gen obamaapp=.
replace obamaapp=1 if approve==2
replace obamaapp=2 if approve==3 /*treats DK as neutral/middle*/
replace obamaapp=3 if approve==1
```

- Once your data are imported into Stata and you have made new variables to work with in this way (when necessary), I recommend consulting the sample `.do` file on Canvas for syntax to follow in performing common statistical procedures.

Project suggestions:

- Carefully consult the assignment description and grading rubric provided earlier in the syllabus as well as the sample posters on Canvas.
- Make sure to create a `.do` file that replicates the analysis in your poster and to submit it along with your poster, data, and experimental materials.
- Take statistical power concerns seriously. Invite as many students to take part in your study as possible but also consider whether enough are likely to take part for you to measure an effect of the magnitude that you expect in your experiment.
- Attractive graphics often convey more information than statistical tables.
- Be careful about including low-quality graphics such as screenshots or saving graphics in a low-resolution format. For images that are not photographs, `.png` and `.pdf` files (“vector” graphics) are preferred over `.jpeg`, `.gif`, etc. (“raster” graphics). The former will look sharp at any resolution while the latter will not. The best way to tell the difference is to zoom in very closely on the image.
- Do not report too many digits in your statistical results! False precision is not helpful to the reader. You don’t want to report the mean is 3.43383893 if you measured each observation on a 1-5 scale. Make a judgment about the appropriate number of digits that are meaningful.
- Raw Stata output is not attractive and typically does not clearly convey your findings to your audience. Think about how your findings can be presented in a more clear and attractive manner.
- Do not use the Distribution tool in Qualtrics to distribute the survey. Instead, copy the reusable link to the survey under Distributions and share the link via email. If you do not have access to lists of Dartmouth students, contact me and I can provide a sample of student email addresses from which you can solicit responses.
- Beware that Stata’s `tttest` command defaults to assuming equal variance when conducting a two-sample test; use the `unequal` option to relax this assumption and instead allow the variance to differ between samples.

Survey instrument suggestions:

- These resources can help you design effective surveys:
 - [Pew Research Center: Questionnaire design](#)
 - [Pew Research Center: How do you write survey questions that accurately measure public opinion?](#)
 - [Harvard University Program on Survey Research: Tips on Question Wording](#)

In general, though, you should try to avoid reinventing the wheel whenever possible. See how other surveys word their questions and follow those conventions by searching the Roper Center's [iPoll database](#) of prior survey research or other standard surveys (Gallup, the American National Election Studies, the General Social Survey, etc.). By following this approach, you will increase the comparability of your findings to prior research.

- It's best practice to start a survey with a consent form so please include an adapted version of this at the beginning:

This survey is a class project for GOVT 10 being conducted by [your names]. We ask for your attention for a few minutes and we thank you for your attention and your responses. Your participation is voluntary and you may decline the survey or withdraw at any time. No information that identifies you will be collected or retained. However, any online interaction carries some risk of being accessed. Do you consent to participate in the survey?

-Yes

-No [end survey in Survey Flow if they choose this]

- You should collect basic demographics for every participant so you can describe who took part in your survey. A simple set of baseline demographic variables are class year, gender, and race. You might consider whether any other characteristics would be important to measure given your research question, however (e.g., affiliation, financial aid status, etc.). Measures of these characteristics can be placed at the beginning or end of your survey but be careful about making your study too long or measuring characteristics at the end that could be affected by your treatment.
- Student participants are likely to fail to read long blocks of text and to drop out of time-consuming studies — remember, many will take your experiment during a spare minute or two on their phone. Your study should be very brief and use a high-impact experimental intervention.
- Beware of ceiling and floor effects in measuring people's attitudes and beliefs — on some topics, people's attitudes don't have much room to move up or down, respectively.

- If your study includes any deception (which must be both mild and ethical!), please include an adapted version of this debriefing at the end:

Thank you for answering these questions. The purpose of this project is to [describe the goal of your project]. During this survey, participants were [explain what happened and clarify if they saw anything that isn't real]. Thank you again for your participation. Please do not share any information about the nature of this study with other potential participants. Should you have any questions about this study, please contact Prof. Brendan Nyhan at brendan.j.nyhan@dartmouth.edu.

- Be sensitive to respondents in phrasing your questions. Provide an alternate option to the male/female question, for instance. Consider also whether you are asking any questions that respondents are likely to answer dishonestly (or skip) given the way the question is phrased.