

Political Science 389
Research Design and Data Analysis for Political Science

Fall 2004

<http://www.umich.edu/~jwbowers/ps389.html>

Class in 7603 HH 10-12 on Fridays, in Angell Hall Computer Lab A 9-10 on Wednesdays

Instructor:	Office Hours:
Jake Bowers	Wednesdays, 2-4pm
jwbowers@umich.edu	6648 Haven Hall (615-9117)

This course aims to introduce students to research design and data analysis as practiced by political scientists. The topics covered include causality and the design of research studies (including experiments and observational studies) and basic applied data analysis. Students who are thinking about writing an Honors Thesis are especially encouraged to enroll.

This is *not* a course that focuses primarily on statistics, and important topics such as probability and linear models will only be covered in passing if at all. Rather, we will be focusing on developing the conceptual tools necessary to design and assess empirical research studies, and on developing the technical and computer skills necessary to work with quantitative data.

By the end of this class I hope that you will have learned: (1) how to ask a focused research question; (2) how to design a measurement strategy for important concepts embedded within your research question; (3) how to design a research study to answer your question; (4) how to present the results of your research study using simple and appropriate techniques; and (5) how to write about your tables and graphs in a simple and persuasive manner.

At the end of this course you will turn in a research design that has the potential to uncover new information about a topic that you care about. Throughout the course there will be small assignments that lead you through the process of creating such a research design. There will also be assignments that will give you practice working with the kinds of data that you are apt to generate from your research design.

Rules There aren't many rules for the course, but they're all important. First, read the assigned readings before you come to class. Second, turn everything in on time. Third, ask questions when you don't understand things; chances are you're not alone. Fourth, don't miss class or section.

I am willing to accommodate reasonable requests for extensions and other issues that involve scheduling conflicts. It is, however, *your* responsibility to let me know about these kinds of conflicts *well in advance*. Most of the time I will require written confirmation of such conflicts and problems. This means that I will not grant extensions if you ask for them within 24 hours of the deadline. The university policy on the grade of "incomplete" will be followed in this course. It is not in your interest to have an incomplete.

Grades Final grades will be based 50% on the final research design and 50% on seminar participation and other assignments. Part of the grade for the design will be based on the quality of the draft that you present.

Quality seminar participation does not mean "talking a lot." It includes turning in assignments on time; thinking and caring about the material, and expressing your thoughts respectfully and succinctly in class. It also means providing excellent and constructive written comments on the drafts of your colleagues' work — that is, you will be graded on the quality of your comments about the work of your colleagues.

Books The following three books were ordered from Shaman Drum bookstore:

- Shively, W. Phillips. 2001. *The Craft of Political Research, Fifth Edition*. Prentice Hall.
- Johnson, Janet and H.T. Reynolds. 2005. *Political Science Research Methods*.
- Dalgaard, Peter. 2002. *Introductory Statistics with R*.

Other books that I recommend as references, and from which I'll be several assigning chapters include:

- William R. Shadish, Thomas D. Cook, Donald T. Campbell. 2001. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Houghton Mifflin.
- David Freedman, Robert Pisani, and Roger Purves. 1998. *Statistics, 3rd Edition*.
- Larry Gonick and Woollcott Smith. 1993. *The Cartoon Guide to Statistics*.

Any readings listed below without an asterisk can be downloaded via the library website (usually from the journal database at www.jstor.com) or are in the assigned books. Other readings listed with an asterisk will be downloadable from the class website or handed out in class.

Schedule

09-08, Wednesday — Introduction

Assignment 1: Find four articles on Jstor which each ask a different kind of question that interests you, upload them to the class website by Tuesday at 5pm, come to class on next Friday prepared to talk about the questions asked — not necessarily the substantive conclusions or other methods.

09-15, Wednesday — Obtaining and Interrogating Secondary Data

Assignment 2a: Find a dataset and a variable within that dataset that interests you. Bring the web-link to that data to the next computer class (Wed, 9-22) OR download that data (including the codebook) to your IFS space. Due next wednesday.

09-17, Friday — Asking Questions and Making Arguments

Readings: Journal Articles from the class website; Shively, 1-31, 164-167

Assignment 3: Bring a draft of a question of your own to the class next Friday. Ideally inspired by/modeled on one of those questions we looked at today.

09-22, Wednesday — Generating Descriptive Statistics

Readings: Johnson and Reynolds, 305-324; *Gonick and Smith, 7-26.

Due: Statistics and code (Assignment 2a).

Assignment 2b: Choose a statistic you care about and generate it, showing all of your work (i.e. telling me exactly what you did and providing the code you used). Due by next Wednesday.

09-24, Friday — Causal Generalization

Readings: *Shadish, Cook and Campbell, preface, ch. 1

Holland, P. 1986. "Statistics and Causal Inference." *Journal of the American Statistical Association*. pp 945-960.

Due: Draft questions.

Assignment 4: Meet with me during the next week to talk about your question. By next Friday, turn in final research question.

09-29, Wednesday — Thinking about Univariate Empirical Data Distributions

Readings: Johnson and Reynolds, 329-336

10-1, Friday — Concept Formation and Measurement

Readings: *Shadish, Cook, Campbell, pp. 64-82; Johnson and Reynolds, 123-128; *Stephen J. Gould, "Bully for Brontosaurus.";

Due: Final questions (Assignment 4).

10-06, Wednesday — Lab on Univariate Description

Assignment 5a: Describe some variable you care about in substantively interesting ways. Present and discuss the distribution of this variable using what you’ve learned in the reading and in class about how to describe data distributions. What have you learned about the real world phenomenon that this variable represents from your analysis? Show all of the commands you typed to produce your analysis (i.e. all of your “code”). Printout due at end of class.

10-08, Friday — Measurement

Readings: Shively, 42-73;

Adcock, R. and D. Collier. 2001. “Measurement Validity: A shared Standard for Qualitative and Quantitative Research.” *American Political Science Review*. 95(3):529-546.

Assignment 6: Develop a measurement plan for your key concepts, due next Friday.

10-13, Wednesday — Relationships between Categorical Variables: Crosstabulation

Readings: *Bowen and Weisberg, Chap 6, *V.O. Key 132-147

10-15, Friday — Experimental Logic as Gold Standard for Causal Inference

Readings: *Shadish, Cook and Campbell, ch 8 (246-278); Johnson and Reynolds, 49-64.

Due: Draft Measurement plan (Assignment 6).

Assignment 7: Write up what would be the ideal experiment to answer your question. Due next Friday.

Assignment 8: Meet with me about your question and draft measurement plan (revised given class input). Final measurement plan due next Friday.

10-20, Wednesday — Lab on Crosstabulation

Assignment 5b: Describe a relationship between two categorical variables you care about in substantively interesting ways. Due at end of class. Show all of your work/code, etc..

10-22, Friday — Observational Studies and Confounding

Readings: Johnson and Reynolds, 74-88;

Gerber, Alan and Donald P. Green. 2000. “The Effects of Canvassing, Direct mail, and Telephone Contact on Voter Turnout.” *American Political Science Review*. Other readings TBA.

Due: Final measurement plan and Ideal Experiment (Assignments 7 & 8).

Assignment 9: Write up what would be the ideal observational study to answer your question — include a discussion comparing the observational study to the experiment. Due in a week.

10-27, Wednesday — Relationships between Categorical and Continuous Variables: Boxplots, Dotplots, Tables of Means

Readings: Tufte, Chapters 2 and 6; Freedman, Pisani and Purves 42-49

10-29, Friday — Observational Studies: Selecting Cases, Sampling

Readings: Shively, 74-109; Johnson and Reynolds, 238-270; *Freedman, Pisani and Purves 1-28.

Due: Ideal Observational study (Assignment 9).

11-03, Wednesday — Lab on Boxplots, Dotplots, Tables of Means

Assignment 5c: Describe the relationship between one categorical and one continuous variable you care about in substantively interesting ways. Printout due at end of class. Show all of your work/code, etc..

11-05, Friday — Observational Studies: Intervention Research

Readings: M. Lewis-Beck and J. Alford, “Can Government Regulate Safety? The Coal Mine Example,” *American Political Science Review*, 1980, pp. 745-756

*D. Campbell and H. Ross, “The Connecticut Crackdown on Speeding,” in E. Tufte, ed., *The Quantitative Analysis of Social Problems*.

Assignment 10: Write up a description of how you plan to select cases for your design. Justify. List at least two different plans. Due in a week.

11-10, Wednesday — *Relationships between Continuous Variables: Scatterplots and Line Fitting*

Readings: Gonick and Smith, Chapter 11.

11-12, Friday — *Methods of Asking Questions*

Readings: Hoyle, Harris, and Judd Chapter 5; Johnson and Reynolds, Chap 10.

Due: Draft sample selection plans due (Assignment 10).

Assignment 11: Meet with me about your sampling plans. Final sampling plans due in a week.

11-17, Wednesday — *Lab on Scatterplots and Line Fitting*

Assignment 5d: Describe the relationship between two continuous variables you care about in substantively interesting ways. Printout due at end of class. Show all of your work/code, etc..

11-19, Friday — *Ethical Issues in Research*

Readings: Hoyle, Harris, Judd, Chapter 3.

Due: Final sampling plans (Assignment 11).

11-24, Wednesday — *Statistical “Control” for Confounds: 3-way tables, Lattice Plots*

Readings: TBA

11-26, Friday — *Break, No Class*

12-01, Wednesday — *Lab on Multi-Way Tables and Multi-Way Plots*

Assignment 5e: Describe how a third variable might confound the relationship between two continuous variables you care about. Show how the relationship changes when you “control for” that third variable. Printout due at end of class. Show all of your work/code, etc..

12-03, Friday — *Philosophy of Science: Induction and Deduction*

Readings: *Shadish, Cook and Campbell, 26-32 (from Readings in Shadish, Cook and Campbell Chapter 1 posted previously); Hoyle, Harris, Judd Chapter 1.

Assignment 12: Drafts of your research design will be due by next Wednesday.

12-08, Wednesday — *Open Discussion of Data Analysis Issues*

Due: Drafts of Research designs (Assignment 12).

Assignment 13: Read and provide constructive criticism of the research designs of the other members of the class. Due in class on Friday (12/10).

12-10, Friday — *Roundtable on Research Design Drafts*

Due: Comments on colleagues’ research design.

12-15, Wednesday — *Wrap Up, Finding Funding*

12-17, Friday — *No Class, Final Research Designs Due*