Getting in touch

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Course website: http://www.fiu.edu/~tardanic


Software—Stata 8: www.stata.com 800-782-8272. Discounted purchase or one-year lease of single-user, perpetual license via FIU/Stata GradPlan, & installed on computers in Graduate Seminar Room, Department of Sociology & Anthropology.


Other website resources: http://davidlane.com/hyperstat/. This is the website for *Hyperstat Online*, an excellent set of wide-ranging resources on statistical methods and their common-sense use.

Grown-ups love figures. When you tell them that that you’ve made a new friend, they never ask you any questions about essential matters. They never say to you, “What does his voice sound like? What games does he love best? Does he collect butterflies?” Instead, they demand: “How old is he? How many brothers has he? How much does he weigh? How much money does his father make?” Only from these figures do they think they have learned anything about him.

-- The Little Prince (quoted in Freeman, Pisani & Purves, *Statistics*, 3e)

Entering HILLSVILLE

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-- From a drawing by Dana Fradon, *The New Yorker Magazine* (in Freeman, Pisani & Purves, *Statistics*, 3e)
What it's about

This course provides a graduate-level introduction to applied statistics within the framework of social research and analysis. The course complements the fall-semester graduate seminars in social theory and social research methods. Its objective is to present basic conceptual and practical tools in social statistics so that—whether or not you intend to pursue a career of doing quantitative studies—you’ll be better equipped, first, to critically assess social (and policy) research carried out from a wide array of methodological perspectives; and second, to make sound methodological decisions and wise interpretations in carrying out your own research projects. Throughout the course we’ll be emphasizing the question, “In what ways does using statistics promote or impede insight into meaningful aspects of social relations and public policies?”

Books, software & supplements

The required books are: Moore & McCabe, Introduction to the Practice of Social Statistics, 4th ed; and Ragin, Constructing Social Research. Strongly recommended as supplementary reading are Utts, Seeing Through Statistics; Hamilton, Statistics with Stata Version 8; Gary King et al., Designing Social Inquiry; and Gary King, Unifying Political Methodology (Introduction).

The earlier editions of Moore/McCabe (along with those of Freedman et al., Statistics) are widely praised as having pioneered a new way of teaching and learning statistics: one that minimizes formulas and derivations while stressing conceptual and real-world issues. Among these are the notion that statistics is simply a means for reaching one kind of understanding of the world; the design of samples and experiments; the analysis of real data; the assessment of social, scientific, and policy debates; and the cultivation of sound judgement and humanitarian criteria in assessing and using statistics. This will be our approach. Ragin’s Constructing Social Research meshes with this emphasis by comparing three basic research methodologies—“multivariate” statistical, case study, and “small-N” comparative—and by proposing points of synthesis. Constructing Social Research, then, also provides a bridge from this course to the graduate seminars in social theory and social research methods (as do King et al.’s Designing Social Inquiry and King’s Unifying Political Methodology). Utts’s Seeing Through Statistics is an engagingly written, non-technical guide to judging and using statistics. It keeps big, real-world matters front and center.

Several other resources will nurture us through the semester. Associated with Moore/McCabe is a web site (http://bcs.whfreeman.com/ips/4e/) and a CD-ROM that contain helpful materials, not least of which are conceptually-oriented quizzes on each chapter and "applets" that permit hands-on, interactive learning. Also associated with Moore/McCabe is an excellent PBS-Annenberg video series, “Against All Odds: Inside Statistics.” This series is available on the shelves in the audio-visual section of the Green Library (5th floor).

We are using the statistical software Stata, which is fast gaining ground in the social, health, and policy sciences. In contrast to the still more commonly used SPSS and SAS—which were born in an era of bulky mainframe computers and clunky top-down organizations—Stata is a product of the PC-age, decentralized work, and flexible specialization. It is much more intuitive as well as much faster and more agile than SPSS or SAS. Most important for us, Stata is designed for “exploratory data analysis” (EDA)—the interactive, “modern” approach (innovated by Bell Labs & Princeton statistician John Tukey) that is epitomized in Moore/McCabe. Stata makes learning statistics easier and in the long run makes advanced statistical techniques (including survey methods) far more accessible than do SPSS or SAS. And if you do need to learn SPSS, by the end of this semester you’ll be capable of using an SPSS introductory book to teach yourself the point-and-click version in a day or so.

UCLA’s Academic Technology Services has created a superb website that makes available an impressive set of free, downloadable materials for learning statistics in tandem with Stata or SPSS, SAS, or specialized statistical software. The subsite http://www.ats.ucla.edu/stat/seminars/ contains introductions to these and other statistical
software programs, including movies. The Stata subsite is located at:
http://www.ats.ucla.edu/stat/stata/.

Software, though, is just a tool. The focus of this course is learning statistics as one way to describe and understand significant aspects of social relations.

Classroom policy, projects, exams & grades

- It is assumed that students will attend all class sessions & arrive on time.
- Questions, comments & discussion are enthusiastically encouraged.
- Graded assignments:
  - Students are responsible for all materials covered in the assigned readings & problems, as well as all materials covered in class sessions.
  - All graded assignments must be completed in order to earn a passing grade in the course. Late assignments—that is, anything turned in after the stipulated date and time—will be graded and returned after the final exam. The grades for late assignments will be severely reduced.
  - Moore/McCabe homework problems on more or less a weekly basis. These include practice not only in solving statistical problems but in using and interpreting statistics wisely. Hands-on practice, done virtually every day, is the only way to learn statistics (and software) as well and as fast as we need to do in this course. The Moore/McCabe problems are meant to foster active learning. In that spirit, most of them have answers, but not step-by-step solutions, in the back of the book. Some of them, moreover, are pegged to the web site’s and CD-ROM’s interactive applets, which in general should be used frequently for active learning of concepts. Grading: pass/fail and worth 20% of the final grade. Passing all of them earns an “A”, all but one of them a “B”, and so on, worth a total of 20% of your course grade. Homework problems assigned at a given class session are due at the start of next class session.
  - Two mini-projects based on part of a large survey of households in Tegucigalpa, Honduras, which I designed and analyzed as part of a World Bank project on urban social inequality and basic services (i.e. housing/land tenure, water, sanitation, and electricity). In each mini-project, each student will use Stata to conceptualize and apply the statistical methods we will have covered, and will interpret the results as well as explore the pro’s and con’s of statistical social research. Grading: each mini-project is worth 20% of your course grade (for a total of 40%). Each mini-project is due at the start of the class session on the due date.
  - Two take-home exams, which will combine statistical problems with essays focusing on the development of sober judgement in selecting, applying, interpreting, and critiquing statistics. Grading: each take-home exam is worth 20% of your course grade (for a total of 40%). Each take-home exam is due at the start of the class session on the due date.

Preparing for class sessions

Each class session will cover the minimum technical information that’s necessary to learn statistics and Stata, and the maximum possible to put social statistics within the frameworks of social theory and social research methodologies.
Regarding the basics of statistics, we’ll stick closely to Moore/McCabe's textbook presentation, emphasizing the broadest conceptual issues. At the start of each session we’ll review some of the homework problems and/or the take-home exam you will have completed. As much as possible we’ll use the problems and exams to raise the big issues about doing social research.

Here’s how to prepare for each session:

- Complete the assigned Moore/McCabe problems and/or the assigned take-home exam or mini-project.
- Review the “Social Research Study Questions” and the “Statistical Methods: Some Pro’s & Con’s” (both of which are attached to the syllabus) before the first class session and throughout the semester. We’ll refer to them frequently.
- The assignments from Ragin, King, and King et al. must be read carefully before the corresponding class sessions.
- The assigned readings from Moore/McCabe should be skimmed before each session, then should be thoroughly covered when doing the homework problems (including use of the instructor-supplied, Stata-formatted text data sets).
- The video series “Against All Odds” is very helpful in presenting highlights & real-world applications.
- Do the web or CD-ROM quiz corresponding to each Moore/McCabe chapter assignment to make sure you’ve mastered the course material. The quizzes, however, will not be graded.
- The ATS-UCLA web site for “Stata Resources” is an excellent resource for learning Stata.
- The Moore/McCabe problems assigned in any given class session are due at the start of the next class session.
- Everything else: Do whatever works best for you.
Tentative Schedule

“Statistics is the art of making numerical conjectures about puzzling questions.”
-- Freeman, Pisani & Purvis, Statistics, 3e

“... variation itself is nature's only irreducible essence.”
-- Stephen Jay Gould, “The Median Isn't the Message”

Homework assignments: Present only the Stata commands & your interpretation of
the output; do not present the numerical or statistical output itself.

Sept. 1  Univariate distributions: graphical & numerical summaries

Ragin, chaps. 1 & 2 (see "Social Research Study Questions" & "Statistical
Methods: Some Pro’s & Cons" attached to syllabus); Moore/McCabe, “To
Students: What Is Statistics?” (pages xxi-xxiv); chap. 1 (pages 2-20,
“Summary” [pages 21-22])

Recommended: Utts, chaps. 1 & 2

Moore/McCabe problems: 1.1, 1.4, 1.6, 1.7, 1.9, 1.13, 1.17, 1.23, 1.25,
1.38, 1.39; 1.121 (Use the Stata-formatted data files that are located on
the course web site.)

Sept. 8  Univariate distributions: graphical & numerical summaries (continued)

Ragin, chap. 3; Moore/McCabe, chap. 1 (pages 38-84)

Recommended: Utts, chaps. 7 (pages 106-23), 8 & 9
Moore/McCabe problems: 1.45, 1.47, 1.49, 1.51, 1.52, 1.59, 1.61, 1.71; 1.77,
1.81, 1.82, 1.83, 1.84, 1.87, 1.89, 1.91, 1.93, 1.95, 1.99

Sept 15  Bivariate distributions: scatterplots, correlation & least-squares
    regression

Ragin, chap. 6; Moore/McCabe, chap. 2 (pages 102-116; 126-31;
135-47; 154-67; 179-85)

Recommended: Utts, chaps. 10, 11 & 12

Moore/McCabe problems: 2.1, 2.7, 2.9; 2.19, 2.21, 2.26, 2.33, 2.34; 2.39,
2.49, 2.55; 2.61, 2.63, 2.67, 2.68, 2.71; 2.79, 2.81, 2.83, 2.85, 2.87; 2.114,
2.115, 2.122, 2.123

Sept 22  Producing data

Ragin, chaps. 4 & 5; Moore/McCabe, chap. 3

Recommended: Utts, chaps. 3, 4, & 5; King et al., chap. 1 (pages 3-27);
King, chap. 1 (section 1.2)
* Exam #1 (take-home) assigned: due at start of class session on September 29.


**Sept. 29**  
*Probability & inference; exam #1 due*

Moore/McCabe, chap. 4 (pages 280-85, 287-98, 305-14, 318-33)

Recommended: Utts, chaps. 15, 16 & 17

Moore/McCabe problems: 4.17, 4.19, 4.20, 4.21, 4.33; 4.41, 4.43, 4.45, 4.51, 4.55, 4.56, 4.59; 4.60, 4.62, 4.63, 4.65, 4.66, 4.73, 4.77

**Oct 6**  
*Sampling distributions*

Moore/McCabe, chap. 5 (pages 364-78, 382-83, 391-400)

Recommended: Utts, chap. 18

Moore/McCabe problems: 5.1, 5.3, 5.5, 5.7, 5.10, 5.13, 5.23, 5.25; 5.29, 5.31, 5.33, 5.35, 5.37, 5.39, 5.49, 5.51, 5.55, 5.57, 5.63, 5.67

**Oct 13**  
*Introduction to inference*

Ragin, chaps. 1-2 (review); Moore/McCabe, chap. 6 (pages 414-24, 426-27, 435-52, 461-66, 469-73)

Recommended: Utts, chaps. 20, 21, 22 & 23; King et al., chap. 1 (pages 3-33)

Moore/McCabe problems: 6.1, 6.2, 6.3, 6.9, 6.14, 6.15, 6.23, 6.29; 6.31, 6.33, 6.35, 6.37, 6.39, 6.41, 6.47, 6.50, 6.51; 6.69, 6.70, 6.74, 6.75, 6.77, 6.79

**Oct 20**  
*Inference for distributions*

Moore/McCabe, chap. 7 (pages 490-505, 511-12, 525-36); chap. 8 (pages 570-78, 581, 587-93)

Recommended: Utts, chaps. 20, 21, 22 & 23

Moore/McCabe problems: 7.1, 7.2, 7.3, 7.4, 7.5, 7.13, 7.15, 7.29, 7.30, 7.37, 7.42; 7.65, 7.66, 7.69, 7.79, 7.81; 7.105
Oct 27  
*Inference for proportions*

Moore/McCabe, chap. 8 (pages 570-78, 581, 587-93)

Recommended: Utts, chap. 19

*Mini-project #1 assigned; due at the start of class session on Nov. 10

Moore/McCabe problems: 8.6, 8.7, 8.11, 8.17; 8.33, 8.35, 8.36, 8.38, 8.47, 8.49, 8.56, 8.57, 8.73, 8.81

Nov 3  
*Inference for two-way tables*

Moore/McCabe, chap. 9 (pages 610-26, 628)

Recommended: Utts, chap. 12


Nov 10  
*Inference for regression; mini-project #1 due*

Moore/McCabe, chap. 10 (pages 656-75, 676-77)

Recommended: Utts, chap. 10

Moore/McCabe problems: 10.4, 10.6, 10.9, 10.10, 10.19, 10.33, 10.34

*Exam #2 (take-home) assigned; due at the start of the class session on Nov. 24*

Nov. 17  
*Inference for regression (continued)*

Ragin & Driscoll, “Afterword”; Moore/McCabe, chap. 11, chap. 1 (pages 51-55), chap. 2 (pages 187-203)

Recommended: Utts, chap. 10

*Mini-project #2 assigned; due at the start of class on Dec. 1*

Moore/McCabe problems: 11.5, 11.17, 11.21, 11.25, 11.27; 1.73, 1.75; 2.92, 2.93, 2.101, 2.111, 2.127

Nov. 24  
Review; exam #2 due

Review Moore/McCabe, chaps. 1-11; Ragin, chaps. 1-6, Afterword; work on mini-project #2

Dec 1  
Review: mini-project #2 due

Dec 8  
Review
Social Research Study Questions

"Blindly plugging into statistical formulas has caused a lot of confusion."
-- Freeman, Pisani & Purves, *Statistics*, 3e

1. What is *social research*? What are the principal differences between social research and other ways of representing social life?

2. What is the *scientific method*? What steps does the scientific method apply in conducting social research?

3. What is a *research strategy*? What are the differences between research strategies that *particularize* and those that *generalize*? What are the potential similarities between such strategies?

4. What is the *social construction of reality*? How does it pertain to the scientific method, social research/research strategies in general, and to other ways of representing social life—including the promises and risks of the various approaches?

5. What are *data*? What are interplays between data and the social construction of reality? Is everything worthwhile *measurable*?

6. What is *statistics*? What is the difference between *descriptive statistics* and *inferential statistics*? How do descriptive statistics and inferential statistics pertain to the principal kinds of *research strategy*?

7. What are advantages and disadvantages of using statistics in social research?

8. What are the intersections between the uses of statistics in social research and the social construction of reality? Conversely, what are the intersections between the "non-uses" of statistics in social research and the social construction of reality?

**Statistical Methods: Some Pro’s & Con’s**

*Some advantages of using statistics*

- Summarizes complex data
- Makes assumptions explicit
- Imposes explicit standards of evidence and comparison
- Raises the possibility of chance associations
- Emphasizes skepticism about hypotheses and findings
- Facilitates the testing of competing hypotheses and the building of theories
- Permits the examination of certain questions that couldn’t otherwise be examined

*Some pitfalls of using statistics*

- The use of statistics represents a strategic tool in the social construction of reality. Thus its use in general must be situated in the historical/geographic context of bureaucratization, state formation and geopolitical competition, industrial/technological revolution, commodification, and urbanization; and the biases of statistical premises and the tendency of the statistically inclined research establishment to claim intellectual/policy hegemony on the basis of a "scientific approach" must be critically examined.
- The use of statistics impedes the examination of certain questions that otherwise would be examined, and obfuscates crucial kinds of social, cultural, and political analysis.
Theory and substantive importance must guide the use of statistics (although the data must inform the theory as well [e.g., making sense of unanticipated nonlinearities or outliers]).

Statistical research needs to emphasize theoretical/substantive significance and the magnitude of relationships between variables, rather than mere “statistical significance” as narrowly defined by mainstream statistical methodology. The research needs to recognize the arbitrariness of institutionalized significance-test standards and to consider alternative criteria for statistical significance.

Statistical research needs to test a study’s findings, not just against its null hypothesis but also against competing theories/hypotheses with the objective of long-term theory building.

We need to use statistics wisely as one of many tools in social research.

**Reminders**

- How were the numbers produced—in the sense of culture and power, and according to the (cultural) rules of scientific method?
- Is the sample random and representative of the population? Insofar as this is not true, then the use of inferential statistics is invalid.
- What is the shape, center, and spread of the distribution? Are there outliers?
- Do the numbers make sense? (adapted from Moore, *The Basic Practice of Statistics*):
  - What’s the explicit or implicit agenda behind them?
  - Is any essential information left out?
  - Are the numbers consistent?
  - Are the numbers plausible, including are they too good to be true?
  - Is the math correct?
  - What do the numbers signify about the social relations being studied?
- Always take “outlying” observations, “non-significant” findings, and otherwise “contrary” findings seriously: What insights do they potentially convey about the social relations that you’re studying, and possibly about social relations more generally?
- You’ve estimated something’s magnitude or likelihood. Don’t lose sight of uncertainty: What’s the thing’s estimated range of magnitude or likelihood? What does this range imply about the social relations being examined?
- Are all worthwhile things measurable? What do your conclusions imply about the social relations and public policies that you’re studying, and perhaps about social relations and public policies in other spheres?

**Benchmarks for assessing the usefulness of any application of social statistics**

- Does the use of statistical methods in any given instance notably improve our intellectual understanding of social relations and public policies?
- In any given instance, what insights does the use of statistical methods provide (or not) in comparison with insights provided by other methods of social research, and in comparison with insights provided by other ways of interpreting the world?

**A strategic point in interpreting & summarizing your study’s results**

- What are the wider, comparative ramifications of your study for the understanding of social relations and social policy/political practice?