

Research Methods 1
SYA 6305
Fall 2008
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Course website: <http://www.fiu.edu/~tardanic>

Software: Stata Version 10: www.stata.com 800-782-8272. Discounted purchase or one-year lease of single-user, perpetual license via FIU/ Stata GradPlan. Stata-10 is installed on computers in the Graduate Seminar Room, Department of Sociology & Anthropology.

UCLA website for learning Stata: <http://www.ats.ucla.edu/stat/seminars/> and <http://www.ats.ucla.edu/stat/stata/>

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 Freedman, Pisani & Purves, Statistics, 4e)

Entering Hillsville

Founded	1802
Altitude	620
Population	3700
Total	6122

- From a drawing by Dana Fradon, *The New Yorker Magazine*
(in Freedman, Pisani & Purves, Statistics, 4e)

What it's about

This course provides a graduate-level introduction to applied statistics within the framework of social research and analysis. 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 conducting your own research. Throughout the course we'll emphasize 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, & Craig, *Introduction to the Practice of Statistics*, 6th ed; Ragin, *Constructing Social Research*, and Fischer et al., *Inequality by Design: Cracking the Bell Curve*. Students are strongly recommended to read portions of Babbie, *The Basics of Social Research*, Utts, *Seeing through Statistics*; Kohler & Kreuter, *Data Analysis Using Stata*; and Hamilton, *Statistics with Stata*.

The earlier editions of *Introduction to the Practice of Statistics* (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 a means for reaching merely one kind of understanding of the world; the design of samples and experiments; the analysis of real statistical data; the assessment of social, scientific, and policy debates; and the cultivation of sound judgment and humanitarian criteria in assessing and using statistics. This will be our approach.

The other assigned books provide bridges between statistics and social research. Ragin's *Constructing Social Research* complements our department's cross-disciplinary approach by comparing three basic research methodologies - "multivariate" statistical, case study, and "small-N" comparative - and proposes points of synthesis. *Constructing Social Research*, then, provides a bridge from this course to our program's seminars in theory and methodology. Fischer et al.'s *Inequality by Design* does so as well by situating multivariate statistical analysis - specifically in regard to academic and policy debate over the alleged relationship of I.Q. to social inequality - within socio-institutional contexts. Babbie's *The Basics of Social Research* provides a comprehensive introduction to social research methods. Utts's *Seeing through Statistics* is an engagingly written, non-technical guide to judging and using statistics.

We'll use the statistical software *Stata*, which is becoming the software of choice in the (non-psychology) 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 that is epitomized in Moore/McCabe/Craig. *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. For a comparison of *Stata*, *SPSS*, and *SAS*, see the following report: http://www.ats.ucla.edu/STAT/technicalreports/Number1/ucla_ATSstat_tr1_1.0.pdf

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*, *SPSS*, *SAS*, or specialized statistical software. The web site <http://www.ats.ucla.edu/stat/seminars/> contains introductions to these and other statistical software programs, including movies. The *Stata* web site is located at: <http://www.ats.ucla.edu/stat/stata/>.

StatTransfer: The Graduate Seminar has one PC with *StatTransfer* to change statistical data from one format (such as *ASCII*, *Excel*, or *SPSS*) to another (such as *Stata*, although *Stata* now has its own command for transferring data from *Excel* to *Stata*).

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

Semester Project/Year-long Project

As part of the graded assignments discussed below, each student will select a data set of analyze during both Research Methods I and Research Methods II, and upon which to write a publication-style paper in Research Methods II. The objective of the year-long project is to foster continuity and depth in learning quantitative research skills, and to learn how to write a publication-style paper based on multiple regression analysis.

Classroom Policy, Projects, Exams & Grades

- It is assumed that students will attend all class sessions & arrive on time.
- Cell phones must be turned off during class sessions, and using your lab computer for emailing and chatting during class sessions is prohibited.
- 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—may be graded and returned after the final exam. The grades for late assignments will be severely reduced.
- *Homework assignments* on more or less a weekly basis (10% of final grade): 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. Grading: pass/fail and worth 10% of the final grade; that is, passing all of them earns an "A", all but one of them a "B", and so on, worth a total of 10% of your course grade. Homework problems assigned at a given class session are due at the start of the next class session.
- A *semester project* based on a data set that each student will chose in consultation with the instructor, and which the student will continue analyzing as the *year-long project* during the spring semester's course on regression analysis (30% of final grade). This requires that, in consultation with the instructor, each student select a data set to analyze for the full academic year. Students will use *Stata* to conceptualize and apply the statistical methods we will have covered, and will interpret the results as well as explore the pros and cons of statistical social research. In doing so, each student will prepare to engage in deeper, more sophisticated analysis of the data set during the spring semester. The project is due during the final exam week.
- *One take-home exam* and *one in-class final exam* (each worth 30% of the final grade), which combine statistical problems with essays focusing on the development of sober judgment in selecting, applying, interpreting, and critiquing statistics.

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/Craig'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:
 - Review the "Social Research Study Questions" and the "Statistical Methods: Some Pros & Cons" (both of which are attached to the syllabus) before the first class session and throughout the semester. We'll refer to them frequently.
 - Skim the assigned readings from Moore/McCabe/Craig should be skimmed before each session, then cover them thoroughly when doing the homework problems.
 - Complete the assigned problems and other assigned work. The homework assigned in any given class session are due at the start of the next class session.

- Reading assignments such as those from Ragin and Fischer et al. must be read carefully before the corresponding class sessions. These provide social-science methodological context to the statistical work.
- Kohler & Kreuter, *Data Analysis Using Stata* and Hamilton, *Statistics with Stata Version 9* are excellent for learning *Stata*, as well as for learning statistics. The UCLA web site for "*Stata Resources*" is also excellent. See also "*Stata survival commands*" and "*Stata practice*" on the course web site.
- Everything else: Do whatever works best for you.

Tentative Schedule

"Statistics is the art of making numerical conjectures about puzzling questions." - Freedman, Pisani & Purvis, *Statistics*, 4e

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

Homework assignments: format the data in Stata, if necessary using StatTransfer (available on a PC in the Graduate Seminar Room). Turn in only the Stata commands (beginning in week #2, by means of a "command log") and your interpretation of the statistical output. Do not turn in the statistical output itself.

Week 1

Univariate distributions: graphical & numerical summaries

- Strydom & du Plessis, "IQ Tests: Do They Measure Intelligence?" <http://iq-test.learninginfo.org/iq02.htm>
- Fischer et al., *Inequality by Design*, chap. 1 and p. 79 ("Defining Poverty")
- Ragin, chaps. 1 & 2 (see also "Social Research Study Questions" & "Statistical Methods: Some Pros & Cons" attached to this syllabus); Moore/McCabe/Craig, "To Students: What Is Statistics?" (pages xxv-xxvii); chap. 1
- Recommended: Utts, chaps. 1 & 2; Babbie, chap. 1
- See the course web site's "*Stata survival commands for Moore/McCabe/ Craig.*"
- *Writing assignment:* What is "social research"? What are its main goals and strategies?
- *Writing assignment:* Use the readings on IQ/intelligence and other relevant readings to answer the following: What does it mean to operationalize a variable? What basic questions should we ask in regard to any variable?
- *Writing assignment:* Go to the website for "ASR Manuscript Submission Information for Authors" and navigate to the "Preparation Checklist for ASR Manuscripts." Type the guidelines for text/content, an example of each kind of text citation, and an example of each kind of bibliographic reference.
- *Statistics problems:* Moore/McCabe/Craig 1.1, 1.3, 1.5, 1.9, 1.10, 1.12, 1.14, 1.19, 1.20, 1.21, 1.25, 1.26, 1.27, 1.32, 1.33, 1.35, 1.41, 1.43; 1.47, 1.48, 1.49, 1.50, 1.51, 1.52, 1.53, 1.57, 1.58, 1.60, 1.62, 1.63, 1.67, 1.69, 1.71, 1.72, 1.76, 1.82, 1.83, 1.84, 1.96, 1.97

Week 2

Univariate distributions: graphical & numerical summaries (continued)

- Artmann, "IQ Tests" <http://www.iq-tests.eu/iq-test-Overview-100.html>
<http://www.iq-tests.eu/iq-test-IQ-correlations-700.html>

- Kimmel, "A War Against Boys?" *Dissent*
<http://www.dissentmagazine.org/article/?article=700>
- Ragin, chap. 3; Moore/McCabe/Craig, chap. 1 (pages 40-56, 64-84)
- "The Work of Edward Tufte" <http://www.edwardtufte.com/tufte/>; "Notes from Edward Tufte Seminar" <http://www.uwm.edu/~david/tufte.html>.
- Recommended: Utts, chaps. 7 (pages 106-23), 8 & 9; Babbie, chap. 2 (pages 40-57)
- *Writing assignment*: List Tufte's "grand principles of information display."
- *Writing assignment*: Utts, chap. 9: List Section 9.1's guidelines for "Well-Designed Statistical Pictures" and Section 9.4's "most common problems in plots, graphs, and pictures."
- *Writing assignment*: Why do univariate distributions matter in terms of substantive issues in social science and in terms of statistics? Why should we graph a univariate distribution before we numerically summarize it? What are the advantages of the five-number distribution?
- *Log & cmdlog*: Learn how to document your statistical work by means of a log file and cmdlog file (see *Getting Started with Stata*, chap. 17).
- *Do-file*: Learn how to do a do-file so that you and others can replicate your statistical work (see *Getting Started with Stata*, pp. 102-105, 107).
 - Beginning this week, always turn in your statistical work by making the cmdlog into a "do-file" and turning in the do-file to document the commands.
- *Statistics problems*: Moore/McCabe/Craig 1.99, 1.100, 1.101, 1.102, 1.103, 1.105, 1.107, 1.111, 1.112, 1.113, 1.116, 1.118, 1.120, 1.122, 1.126, 1.128, 1.130, 1.132, 1.136, 1.146, 1.149, 1.160, 1.161, 1.172

Week 3

Bivariate distributions: scatterplots, correlation & least-squares regression

- Fischer et al., *Inequality by Design*, chaps. 2 & 3
- Ragin, chap. 6; Moore/McCabe/Craig, chap. 2
- Recommended: Utts, chaps. 10, 11 & 12
- *Profile.do*: See *Getting Started with Stata*. As begun last week, continue turning in a do-file for each homework assignment.
- *Writing assignment*: How is large-scale quantitative research similar to and different from other kinds of social research?
- *Statistics problems*: Moore/McCabe/Craig 2.1, 2.3, 2.4, 2.6, 2.7, 2.8, 2.9, 2.10, 2.17, 2.29, 2.30, 2.31, 2.32, 2.37, 2.41, 2.46, 2.49, 2.50, 2.51, 2.53, 2.55, 2.57, 2.58, 2.60, 2.67, 2.74

Week 4

Bivariate distributions: scatterplots, correlation & least-squares regression (continued)

- Moore/McCabe/Craig, chap. 2
- Recommended: Utts, chaps. 10, 11 & 12
- *Writing assignment*: What can be misleading about measures of correlation and regression, and why? When might there be a strong bivariate relationship but a low correlation or regression coefficient? What are the advantages of regression versus correlation? What are the basic ways of establishing and explaining causation? What critical questions must we ask concerning the relationship between two variables?

- *Statistics problems:* Moore/McCabe/Craig 2.83, 2.87, 2.89, 2.90, 2.91, 2.92, 2.102, 2.103, 2.104, 2.105, 2.106, 2.107, 2.108, 2.111, 2.120, 2.122, 2.123, 2.124, 2.125, 2.126, 2.127, 2.128, 2.131, 2.132, 2.134, 2.153, 2.159, 2.162,

Week 5
Producing data

- Erulkar & Chong, "Evaluation of a Savings & Micro-Credit Program for Vulnerable Young Women in Nairobi" (esp. pp. 6-9) http://www.popcouncil.org/pdfs/try_evaluation.pdf
- Ragin, chap. 4; Moore/McCabe/Craig, chap. 3 (pp. 171-212)
- Recommended: Utts, chaps. 3, 4, & 5; Babbie, chaps. 4, 5, & 7
- *Writing assignment:* What is "statistical" significance? Give a social-science example of how it can be different from "practical" or "theoretical" significance? What is bias? What is variability? Why are random assignment and random sampling important? Why is comparative design important? What are the advantages of experimental research and the reasons for these advantages? What are the disadvantages of experimental research? What are the main sampling designs? What are the advantages and disadvantages of each sampling design? What are possible "sampling" and "non-sampling" sources of error in surveys? Regarding qualitative research, what is "theoretical sampling"?
- *Statistics problems:* Moore/McCabe/Craig 3.1,3.2,3.3,3.4, 3.7, 3.8, 3.9, 3.12, 3.13, 3.19, 3.24, 3.25, 3.28, 3.37
- *Statistics problems:* Moore/McCabe/Craig 3.48, 3.50, 3.52, 3.53, 3.56, 3.61, 3.63, 3.64, 3.65, 3.68, 3.71, 3.72, 3.73, 3.74, 3.76, 3.77, 3.78

Week 6
Producing data (continued); Exam #1 Assigned

- Ragin, chap. 4; Moore/McCabe/Craig, chap. 3 (pp. 212-236)
- Recommended: Utts, chaps. 3, 4, & 5; Babbie, chaps. 4, 5, & 7
- *Exam #1* (take-home) assigned: due at start of class in week 9.
- *Statistics problems:* Moore/McCabe/Craig 3.79, 3.80, 3.81, 3.82, 3.83, 3.84, 3.85, 3.86, 3.88, 3.89, 3.90, 3.92, 3.93, 3.94, 3.95, 3.97, 3.98, 3.99, 3.100, 3.102, 3.103, 3.110, 3.112, 3.124, 3.126, 3.128, 3.131

Week 7
Probability & inference; Semester Project Assigned

- Moore/McCabe/Craig, chap. 4
- Recommended: Utts, chaps. 15, 16 & 17
- *Semester project* assigned: due at the officially scheduled date/time of the final exam.
- *Writing assignment:* What is a probability distribution? Why is the reason for using the term "expected value of random variable" instead of "mean of a random variable"? What is the Law of Large Numbers? How many trials are need to guarantee a mean outcome close to the population mean? What are "independent observations" (or events), and when can this requirement be relaxed? What is "conditional probability," and what would be a social-science example?
- *Statistics problems:* Moore/McCabe/Craig 4.1, 4.8, 4.9, 4.10, 4.12, 4.13, 4.15, 4.17, 4.24, 4.25, 4.46, 4.49, 4.53, 4.60, 4.67, 4.68, 4.69, 4.70, 4.83, 4.94, 4.95, 4.96,4.97, 4.99, 4.118, 4.119, 4.120, 4.121

Week 8
Sampling distributions

- Moore/McCabe/Craig, chap. 5
- Recommended: Utts, chap. 18
- *Writing assignment:* What is a sampling distribution and a population distribution, and what would be a social-science example of both? What is a count and a sample proportion, and a social-science example of each? What is the "binomial setting," and what is a social-science example? What is a binomial distribution and a sampling distribution of a count? When should we use a binomial sampling distribution? Why are sample means used in statistical inference? What is the sampling distribution of a sample mean, and what is a social-science example? How do we compute the mean and standard deviation of a sample mean? What is the Central Limit Theorem, and why is it important? Why does the sample mean of an SRS from a normal population have a normal distribution, and what principle does this illustrate?
- *Statistics problems:* Moore/McCabe/Craig 5.1, 5.3, 5.9, 5.11, 5.18, 5.22, 5.24, 5.25, 5.26, 5.31, 5.38, 5.39, 5.47, 5.50, 5.73, 5.77

Week 9
Introduction to inference: Exam #1 Due

- Erulkar & Chong, "Evaluation of a Savings & Micro-Credit Program for Vulnerable Young Women in Nairobi" (esp. pp. 6-9) http://www.popcouncil.org/pdfs/try_evaluation.pdf
- Ragin, chap. 5; Moore/McCabe/Craig, chap. 6
- Recommended: Utts, chaps. 20, 21, 22 & 23; Babbie, chap. 7 (pages 197-206)
- *Exam #1 (take-home) due*
- *Writing assignment:* What is "statistical inference"? For what kinds of data is it valid or invalid? What is the difference between statistical significance and "practical" or "theoretical" significance? What is a confidence interval, and how is it computed? What are the data requirements for a valid confidence interval, and how do we check these requirements? How can we reduce a confidence interval? How do we test a hypothesis? What is wrong with accepting a null hypothesis? What is wrong with accepting an alternative hypothesis? What is a P-value? What is the Bonferroni multiple-comparison procedure, and why and when should it be used? What is wrong with "searching for statistical significance"? When should statistically insignificant results be reported and explained? What are Type I and Type II errors, and what is an example of each? How does the logic of quantitative - inferential analysis differ from that of comparative case-study analysis?
- *Statistics problems:* Moore/McCabe/Craig 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.10, 6.11, 6.28, 6.35, 6.36, 6.39, 6.40, 6.43, 6.45, 6.47, 6.50, 6.52, 6.54, 6.55, 6.60, 6.69, 6.77, 6.84, 6.87, 6.89, 6.90, 6.91, 6.93, 6.98, 6.101, 6.104, 6.105, 6.107

Week 10
Inference for distributions

- Erulkar & Chong, "Evaluation of a Savings & Micro-Credit Program for Vulnerable Young Women in Nairobi" (esp. pp. 6-9) http://www.popcouncil.org/pdfs/try_evaluation.pdf
- Moore/McCabe/Craig, chap. 7
- Recommended: Utts, chaps. 20, 21, 22 & 23

- *Writing assignment:* What is a t distribution, when is it used, and how is it computed? How do t distributions differ from z distributions, and at one point do they become more or less identical? When do we use one-sample and two-sample t tests, and what is a social-science example for each? What are the data requirements for such tests? What in general are test alternatives if the data requirements are not met?
- *Statistics problems:* Moore/McCabe/Craig 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 7.10, 7.14, 7.29, 7.30, 7.54, 7.56, 7.69, 7.70, 7.71, 7.81, 7.84, 7.85, 7.120, 7.127

Week 11
Inference for proportions

- Erulkar & Chong, “Evaluation of a Savings & Micro-Credit Program for Vulnerable Young Women in Nairobi” (esp. pp. 6-9) http://www.popcouncil.org/pdfs/try_evaluation.pdf
- Moore/McCabe/Craig, chap. 8
- Recommended: Utts, chap. 19
- *Writing assignment:* What is a social-science example for single proportion and for two proportion inference? What are the data requirements?
- *Statistics problems:* Moore/McCabe/Craig 8.1, 8.3, 8.5, 8.6, 8.9, 8.14, 8.15, 8.23, 8.32, 8.35, 8.37, 8.63

Week 12
Inference for two-way tables

- Erulkar & Chong, “Evaluation of a Savings & Micro-Credit Program for Vulnerable Young Women in Nairobi” (esp. pp. 6-9) http://www.popcouncil.org/pdfs/try_evaluation.pdf
- Moore/McCabe/Craig, chap. 9
- Recommended: Utts, chap. 12
- *Checking/cleaning data:* Do the assignment on checking/cleaning data (check_data.do), and describe the steps involved in evaluating and checking/cleaning a data set.
- *Writing assignment:* What are the data requirements for two-way tables? What are some social-science examples of two-way tables? What is Simpson's Paradox, what is the reason for it, and how should we address it? What is the chi-square statistic? How do we test a hypothesis for a two-way table?
- *Statistics problems:* Moore/McCabe/Craig 9.1, 9.2, 9.7, 9.8, 9.11, 9.18, 9.30, 9.34, 9.35

Week 13
Inference for regression

- Moore/McCabe/Craig, chap. 10
- Recommended: Utts, chap. 10
- *Writing assignment:* What is simple linear regression? How does it differ from correlation? When might there be a strong bivariate relationship but a weak correlation or regression coefficient? What are the data requirements for regression? What do the following mean: DATA=FIT + RESIDUAL? What is the fundamental difference between how regression is treated in Moore/McCabe/Craig chaps. 2 and 10? How do we test a hypothesis for a regression coefficient? What does it mean if the plotted residuals of a regression model are not randomly distributed?
- *Statistics problems:* Moore/McCabe/Craig 10.1, 10.5, 10.6, 10.7, 10.23, 10.24, 10.37, 10.38, 10.46, 10.53

Week 14

Thanksgiving Break

Week 15

Inference for regression (continued)

- Fischer et al., *Inequality by Design*, chaps. 4-6 & 8; Appendix 1 & 2
- Ragin & Driscoll, "Afterword"; Moore/McCabe/Craig, chap. 11
- Scott Long & Jeremy Freese, "Replication Standards for Quantitative Social Science: Why Not Sociology?" <http://www.jeremyfreese.com/docs/freese-reproducibility-webdraft.pdf>
- Recommended: Utts, chap. 10

- *Writing assignment:* Write a paragraph summarizing Long & Freese's recommendations for standards of replication in quantitative social science.
- *Writing assignment:* What is the advantage of multiple regression over simple regression? Explain why or why not a strong/weak bivariate relationship may not result in a strong/weak multivariate relationship, including what this has to do with our previous reading on causal relations?
- *Statistics problems:* Moore/McCabe/Craig 11.1, 11.3, 11.4, 11.10, 11.13, 11.15, 11.27, 11.28, 11.29, 11.31, 11.32, 11.33

Week 16

Final exam, Semester project due

Social Research Study Questions

"Blindly plugging into statistical formulas has caused a lot of confusion."
Freedman, Pisani & Purves, *Statistics*, 4e

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," broadly speaking? 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 strategies?
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 Pros & Cons

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 the use of statistics 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, for the most part, the use of inferential statistics is invalid.
- What are 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 fundamental question in summarizing a social-science study's results

What are the ramifications of the specific study for, first, other instances of the problem and, second, other kinds of problems in regard to our quest to understand social relations and social policy/political practice?