

API-205
POLITICS AND POLICIES: WHAT CAN STATISTICS TELL US?

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Meetings: Monday and Wednesday 1:15 pm-2:30 pm in L-140

Review Session: Friday 2:45 pm-4 pm in L-140

Shopping: Monday Aug 29 from 1:15-1:45 and from 2:00-2:30 in L-140

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Overview

Intended for decision makers, the goal of this course is to enable you to interpret statistical information and use data to advocate and negotiate. We emphasize the role of statistics in evaluating the impact of policies and programs. Class discussions will be based on cases from international development, politics, education, health care, and the legal system. You will focus on explaining results in non-technical language, suitable for a news article or parliamentary briefing.

Course Meetings

Lectures will center on the development of concepts and understanding their importance in a policy context. Your active participation is warmly welcomed! Review sessions and office hours provide the opportunity to ask questions and get started on assignments. We look forward to working with you.

Do you need a text-book?

Lecture notes are available for each class and assignments are posted on the course page. Assignments are not from a book. Some people find it helpful to have a book to see a second approach to topics; other do not find it necessary. Before buying a book, make sure you need one!

Textbooks: Two Possibilities

Statistical Reasoning for Everyday Life, 4th edition, by Jeffrey Bennett, William Briggs, Mario Triola. (Pearson, 2014, ISBN #0-321-81762-1.)

Student Solutions Manual for Statistical Reasoning 4th edition, by Bennett, Briggs, Triola (Pearson, 2014, ISBN #0-32181763-X.) The text and solutions manual are in the Coop and the KSG Library.

Or

The Practice of Statistics for Business and Economics, 3rd edition, by David. S. Moore et al (Freeman, 2011, ISBN# 978-1-4292-3281-4).

Optional Alternative Text

Essential Statistics 2nd edition, by David S. Moore (Freeman, 2013, ISBN# 1-4292-5517-X or 1-4292-5568-4). You can also use the 1st edition. *Study Guide with Selected Solutions for Essential Statistics*, by M. Flinger

What is the difference between the two main texts? It is *not* necessary to get both.

Texts provide an additional approach to the topics. Reading assignments are given from both books; choose one or borrow from the library. The difference between the texts is that *Statistical Reasoning* has fewer formulas and is more talkative. The end part of API-205 is not in *Statistical Reasoning*. *The Practice of Statistics for Business and Economics* goes further—but will be harder going at the start. Before choosing a text, look at both books at the Coop. Second hand versions of the books or older editions are available on line.

Additional Readings

The reading posted are all optional, but provide background and sources for those who are interested. They will not be assessed.

Prerequisites

The mathematical background required will be kept to a minimum, though students will be expected to be familiar with algebra and able to handle data with a calculator and Excel. The most important prerequisite is the willingness to ask questions and to grapple with ideas in a policy context.

Case Studies and Examples

The course website contains data sets and additional readings that provide background for the case discussions and examples. These may include:

- Election fraud: Allegations and evidence in Ghana, Albania, Iran, US, Venezuela
- Exit polls and polling regulation around the world
- Redistricting and Voter IDs in US: Voting Rights Act of 1965
- Regulating the fashion industry
- Value added measures of teaching and educational attainment
- Corruption: Identification, impact, relation to gender
- Education of Afro-Caribbean boys in UK
- Set-asides of university places in India: Education of underprivileged castes
- Legal cases in which statistics played a decisive role: Howland, Collins, Clark
- War deaths in Vietnam, Iraq, and D. R. Congo
- Human Development Index, World Bank development indicators and governance indicators
- Labor market discrimination in the US: New Haven firefighters; NCAA football coaches
- Workers' protection: Denim and sandblasting
- Roadside stops and racial profiling: New York and Los Angeles
- Madrasa enrollment in Pakistan; impact of the Hajj
- Cross-country relationships: Growth, taxes, debt, wealth, and happiness
- Taxes and debts: Cross country comparisons
- Medical testing policy: HIV, pap smears, and mammograms
- The death penalty: Deterrence and justice
- Measles, mumps, rubella (MMR) vaccine controversy
- Malaria: Impact and prevention
- Voting patterns of women judges: Sonia Sotomayor's Supreme Court nomination
- IQ and immigration
- Randomized Control Trials (RCTs): Dr. Frances Kelsey and thalidomide; development policy
- Discovery of the cause of cholera
- Ethical issues in Statistical Experiments: HIV in Tanzania, Syphilis, Tearoom Trade
- Press Freedom: Reporters without Borders

Assignments and Assessments

There will be eight assignments to be handed in (three or four problems each); two progress checks in class (Wednesday, October 5 and Wednesday, November 2) and a final assessment on Wednesday December 7.

In preparation for each assessment, plenty of sample materials will be available. The assessments will be shorter than the allotted time so there is ample time to read and think.

You are welcome to discuss assignments with the course staff or other students. *The important thing is to learn and understand the material.* Each student must write his or her own solutions individually. Solutions may not be shared; sources and collaborators should be listed. Assignments are due in class on Wednesdays (Sept 14, 21, 28, Oct 12, 19, 26, Nov 9, 16) and will be available the previous week.

Project

There will be an optional final project showing an application of the course material to a professional context. You can decide later in the semester whether you want to do it.

Grading

Final grades will be based on the highest score generated by the following two methods:

Weekly assignments (eight)	20% in total	or	20% in total
First progress check	15%		20%
Second progress check	20%		20%
Final assessment	35%		40%
Final project	10%		

The lowest two assignment scores will be dropped. If the final assessment shows significant improvement over the progress checks, it will be counted more heavily. If the second progress check is stronger than the final assessment, it will be counted more heavily. Letter grades are determined in accordance with the HKS recommended grade distribution:

<http://www.hks.harvard.edu/degrees/registrar/faculty/exams-and-grading/grades>

Course Schedule:

<u>Date</u>	<u>Lecture Topic</u> <u>Reading:</u> SR is <i>Statistical Reasoning</i> SBE is <i>Statistics for Business and Economics</i>	<u>Assignments</u>
Week 1 Mon Aug 29	<u>Shopping:</u> “Let the Numbers Speak”: Goals of API-205 (Source unclear: http://stats.stackexchange.com/questions/91789/who-said-let-the-data-speak-for-themselves)	<u>Shopping</u> <u>Location:</u> L-140 1:15-1:45pm and 2:00 – 2:30pm
Wed Aug 31	<u>Lecture #1</u> Distributions: Normal and Skewed Distributions; Normalization; Probability. <i>Examples: EU incarceration rates; IQ and Flynn effect; regulating the fashion industry; investments.</i> <u>Reading:</u> SR text: Sections 5.1, 5.2, 6.1, 6.2, (to mid p.203), 6.3 (p.208-mid p. 209, p.211-212) SBE text: Sections 1.3, 4.1, 4.2 “IQ and Immigration Policy”, by Jason Richwine, May 2009, http://delong.typepad.com/pdf-1.pdf “None of the Above: What I.Q. doesn’t tell you about race” by Malcolm Gladwell, <i>The New Yorker</i> , Dec 17, 2007 “Why IQs Rise” by Meehan Crist, Tim Requarth, <i>The New Republic</i> , Oct 25, 2012 “Everyone knew she was ill” January 13, 2007 http://www.theguardian.com/lifeandstyle/2007/jan/14/fashion.features4	
Fri Sept 2	<u>Lecture #2</u> Sampling and Data Gathering: Random, Stratified, and Cluster Samples. Sampling frame; Internal and External Validity. <i>Examples: Calling an Election (1948), Current Population Survey, Household surveys</i> <i>Case Study: Madrassa enrollment in Pakistan; War deaths in Vietnam, Iraq, D.R. Congo</i> <u>Reading:</u> SR Text: Section 1.1, 1.2. SBE Text: Section 3.1 “The Human Cost of War” by Les Roberts. <i>The Lancet Medical Journal</i> “Fifty years of violent war deaths from Vietnam to Bosnia: analysis of data from the world health survey programme” by Ziad Obermeyer, <i>British Medical Journal</i>	

“Religious School Enrollment in Pakistan: A Look at the Data” December 2005, by T.Andrabi, J. Das, A. Khwaja, T. Zajonc

“Mortality in the Democratic Republic of Congo: a nationwide survey”, by B. Coghlan, et al, *The Lancet*, 2006.

Week 2

Labor Day: Holiday

Mon Sept 5

Wed Sept 7

Lecture #3

Observational Studies vs. Experiments. Experimental Design: Placebos, Controls, Hawthorne Effect, Confounding. Randomization and Natural Experiments. Ethical Issues in Experimentation.

Assignments

#1 available

Cases and Examples: Policies to Encourage Marriage, Hormone Replacement Therapy, Physicians' Health Study, Video-games and Disease, Identification of Cholera Source, Circumcision, MMR vaccine, Tuskegee Syphilis Study, Tearoom Trade, Tanzania HIV Study

Reading: SR Text: Sections 1.3, 1.4
SBE Text: Section 3.1

Sources:

“America's Toe-Tapping Menace” by Laura MacDonald, *New York Times*, Sept 2, 2007

“Statistical Models and Shoe Leather”, by David A. Freedman

“No Link Between MMR Vaccine and Autism” Chris Guillot, N.C. Journal of Law and Technology, Feb 18, 2009

“Estimating the Impact of the Hajj: Religion and Tolerance in Islam’s Global Gathering” D. Clingingsmith, A. Khwaja, M. Kremer, 2008

“Male Circumcision”, American Academy of Pediatrics, Aug 27, 2012

“Harvard Researchers Accused of Breaching Students’ Privacy”, The Chronicle of Higher Education”, July 10, 2011

“But the data is already public”: on the ethics of research in Facebook, Ethics Information Technology, 2010

Week 3

Lecture #4

Mon Sept 12

Sampling Distribution of Proportions, Central Limit Theorem. Data types.

Case Study: Albania’s mayoral election, May 2011; Venezuela’s 2004 referendum on the recall of Hugo Chavez. New Haven firefighters; coaches for US college football

“Who You Know & Who Knows You: The Hiring Process & Practice of NCAA FBS & FCS Head Coaching Positions” Keith Harrison, Black Coaches and Administrators, 2008

Reading: SR Text: Section 8.1
SBE Text: Section 3.3 and 8.1 (page 458)

Wed Sept 14 Lecture #5
Sampling Distribution of Means, Central Limit Theorem. Data types.

Assignment
#1 due
#2 available

Example: *Repeated sampling; Baby weights: Russia, Texas, Indonesia, Spain*

Reading: SR Text: Section 5.3, 8.1
SBE Text: Section 4.4

Week 4
Mon Sept 19 Lecture #6
Probability, Conditional Probability, and Equity

Policy Questions: *Vitamin A Study; Should Afro-Caribbean boys in UK be educated separately? Should Set-Asides in Indian Colleges be Expanded, US Voter ID Laws*

Reading:
SR Text: Sections 6.1, 6.2, (to mid p.203), 6.3 (p.208-mid p. 209, p.211-212)
SBE Text: Section 4.1, 4.2

Sources:
“Bad attitudes; Race and education” *Economist*, Mar 10, 2005

“Tackling low educational achievement” by Robert Cassen and Geeta Kingdon, Joseph Rowntree Foundation, 2007

“Under-Representation of Disadvantaged Classes in Colleges: What Do the Data Tell Us?” by Rana Hasan and Aashish Mehta. *Economic and Political Weekly*, Sept 2, 2006, 3791–3796

Wed Sept 21 Lecture #7
Independence, p -values and Significance Levels

Assignments
#2 due
#3 available

Examples: *Age and Gender, Sally Clark, Vitamin A Study, Polls,*

Reading:
SR Text: Section 4.4 and 6.1, 6.5 (p. 224).
SBE Text: Section 5.1, 5.2

Optional Reading
Like Mother, Like Daughter? An Economic Comparison of Immigrant Mothers and Their Daughters” by Gary Smith and Margaret Hwang Smith, *International Migration*, 2013

Week 5
Mon Sept 26 Lecture #8
Confidence Intervals: Means. Margin of Error and Sample Size.

Example: *Radar detectors and speeding*

Case Discussion: *Civilian Deaths in Iraq: Lancet studies. War Deaths in Vietnam*

Reading: SR Text: Section 8.2
SBE Text: Section 6.1

“The Human Cost of War” by Les Roberts. *The Lancet Medical Journal*

“Fifty years of violent war deaths from Vietnam to Bosnia: analysis of data from the world health survey programme” by Ziad Obermeyer, *British Medical Journal*

Wed Sept 28 Lecture #9

Confidence Intervals: Proportions. Margin of Error and Sample Size.

Assignments

#3 due

Examples: 2011 Venezuelan polls, Presidential approval ratings

Reading: SR Text: Section 8.3
SBE Text: Section 8.1

Week 6

Lecture #10

Mon Oct 3

Hypothesis Testing: Means: One Sample. Practical and Statistical Significance

Assignments

#4 available

Example: Malaria and drug testing; slide in SAT scores

Reading: SR Text: Sections 9.1–9.2
SBE Text: Sections 6.2 and 7.1

“Frances Oldham Kelsey, FDA scientist who kept thalidomide off U.S. market, dies at 101”, The Washington Post

“J&J forms ‘compassionate use’ panel for experimental drugs”, Aljazeera America

Wed Oct 5

Progress Check

Week 7

Columbus Day: Holiday

Mon Oct 10

Wed Oct 12

Lecture #11

Hypothesis Testing: Means: Two samples

Assignments

#4 due

#5 available

Examples: Do poets die young? Do women talk more than men?

Case Discussion: Did the Washington Consensus work? Comparison of growth rates of developing countries; Rule of Law and development; Redistricting in Arizona

Reading: SBE Text: Section 7.2

“Goodbye Washington Consensus, Hello Washington Confusion?”, by Dani Rodrik (2006) p. 1-2

Week 8

Lecture #12

Mon Oct 17

Hypothesis Testing: Proportions: One Sample

Examples: Hispanics and Jews on Juries; Army suicide rates; testing a HIV vaccine

Case Study: Madrassa Enrollment in Pakistan; Kissing study

Reading: SR Text: Section 9.3
SBE Text: Section 8.1

“Pakistan’s Madrassas, Extremism and the Military,” Crisis Group, July 29, 2002,
July 15, 2005

“Religious School Enrollment in Pakistan: A Look at the Data” December 2005, by
T.Andrabi, J. Das, A. Khwaja, T..Zajonc

Wed Oct 19

Lecture #13

Hypothesis Testing: Proportions: Two samples

Assignments

#5 due

#6 available

Case Studies: NYPD stop and frisk; LAPD roadside search; Labor market
discrimination; Miller-El vs. Cockrell

Reading: ES Text: Chapter 21, p. 420
SBE Text: Section 8.1, 8.2
Summary sheet for formulas

“Judge Rejects New York’s Stop-and-Frisk Policy” *New York Times*, Aug 12, 2013

“Driving While Black in the City of Angels” by Lily Khadjavi, in *Chance*, 2006

“Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment
on Labor Market Discrimination” by Marianne Bertrand and Sendil Mullainathan,
American Economic Review, 2004:

Week 9

Mon Oct 24

Lecture #14: with Christopher Robichaud, Lecturer in Ethics, HKS

The Search for Causation: Correlation and Causation; Confounding.

Policy Question: Should We Have the Death Penalty?

Reading: SR Text: Section 7.1, 7.2, 7.4
SBE Text: Sections 2.1, 2.1, 2.4

“Does Death Penalty Save Lives?” *NY Times*, Nov 18, 2007 (*plus links*)

“The State of the Death Penalty: Evaluating Fairness and Accuracy in State Death
Penalty Systems” American Bar Association, Oct 2007

Wed Oct 26

Lecture #15

Least Squares Bivariate Regression, Prediction, and Hypothesis Testing

Assignments

#6 due

Examples: Cigarettes and lung cancer death

Case Study: Social cohesion between Jews and Arabs in Haifa, Israel.
The 2002 Alabama gubernatorial election

Reading: SR Text: Section 7.1, 7.2, 7.3
SBE Text: Section 2.3, 10.1

“Positive prejudice: Really loving your neighbour” *Economist*, 2007

“Allophilia” by Todd Pittinsky, in *Compass*, 2005

“Strange Case of an Imprisoned Alabama Governor” *New York Times*, Sept 10, 2007

“A Statistical Analysis of Possible Electronic Ballot Box Stuffing; The Case of Baldwin County Alabama Governor’s Race in 2002”, by James Gundlach, April 11, 2003.

Week 10 Lecture #16 **Assignments**
Mon Oct 31 Multiple Regression and Hypothesis Testing #7 available

Examples: *Cross country comparison of Central Bank independence and inflation; Voice pitch and reproductive success*

Reading: SBE Text: Section 11.1, 11.2

Wed Nov 2 **Progress Check**

Week 11 Lecture #17
Mon Nov 7 Multiple Regression and Hypothesis Testing: Dummy Variables. Reading a Regression Table; Interpreting Coefficients

Reading: SBE Text: Section 11.3

Wed Nov 9 Lecture #18 **Assignments**
Program Evaluation: Regression Coefficients and Significance #7 due
#8 available

Case Discussion: *Deworming and Education*

Reading: “How to Read a Regression Table” G. Meirer, J. Rauch, in *Leading Issues in Economic Development*, Oxford, 2005

Fri Nov 11 **Veteran’s Day**
Holiday

Week 12 Lecture #19
Mon Nov 14 Reading a Regression Table: Interpretation of Coefficients; Dummy Variables

Case Discussion: *What is the impact of value added metrics for teachers?*

Source: “The Long-Term Impacts of Teachers: Teacher Value-Added and Student Outcomes in Adulthood” Raj Chetty, John N. Friedman, Jonah E. Rocko, Dec 2011

Wed Nov 16 Lecture #20 **Assignments**
Reading a Regression Table: Interpretation of Coefficients: Log & Dummy Variables #8 due

Discussion: What is the impact of employment on women's fertility?

"Jobs and Kids: Female Employment and Fertility in China" H. Fang, K. Eggleston, J. Rizzo, R. Zeckhauser, Faculty Research Working Paper, HKS., Nov 2012.

Week 13 Lecture #21

Mon Nov 21 Reading a Regression Table: Interpretation of Coefficients; Log & Dummy Variables

Discussion: What is the impact of International Criminal Court (ICC) cases?

"Unintended Positive Complementarity: Why International Criminal Court Prosecutions May Increase Domestic Human Rights Prosecutions" G. Dancy and F. Montal, Oct 30, 2015 http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2736519

Discussion: What has been the long term impact of the slave trade?

"The Long-Term Effects Of Africa's Slave Trades", Nathan Nunn, *The Quarterly Journal of Economics*, February 2008

Wed Nov 23 ***Thanksgiving Holiday***

Week 14 Lecture #22

Mon Nov 28 Reading a Regression Table: Interpretation of Coefficients; Logarithmic Variables

"The Impact of Public Officials' Corruption on the Size and Allocation of U.S. State spending" by C. Liu, J. Mikesell, *Public Administration Review*, May/June 2014

"Focus on Corruption", Aaron Ausland and Alfonso Tolmos, Second Year Policy Analysis Paper, HKS-MPAID, 2005

Wed Nov 30 Lecture #23

Reading a Regression Table: Interpretation of Coefficients; Logarithmic Variables

Case Discussion: *Are women less corrupt than men?*

"Gender and Corruption" by Anand Swamy, Stephen Knack, Young Lee, and Omar Azfar, *Journal of Development Economics*, Volume 64, Issue 1, Feb 2001, pp. 25-55

Wed Dec 7 **Final Assessment**
9-12 noon