226: Quantitative Methods in Politics and Sociology
Reading list for 2012-13

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Rubric:
Candidates will be expected to show an understanding of applications of quantitative methods in politics and sociology including the following. The principles of research design in social science: data collection; the logic of causal inference; and comparative method. Major statistical methods and concepts: types of random variables; independence, correlation and association; sampling theory; hypothesis testing; linear and non-linear regression models; event-history analysis; and time-series. Candidates will be expected to interpret statistical information and show familiarity with major methodological debates in political science and sociology.

Aims and Objectives:
To enable students to engage critically with the quantitative social science literature, assess the quality of the research design, data, methodology and conclusions from a piece of social science research; to understand the nature and relevance of statistical concepts and methods that are commonly used in social science; and to interpret statistical information of varying degrees of sophistication. No formal training in mathematics is required.

Course Assessment:
The course will be assessed by means of a three-hour unseen examination according to the provisions established in the Examination Decrees and Regulations, a copy of which will be issued to each undergraduate student in the Politics Department. Further details will be available in the PPE Handbook, and Essential Information for Students, copies of which will also been issued to each undergraduate and are also available on the Politics Department’s web-site. The exam will have two parts: A and B. Candidates will be expected to answer one of the two questions available in part A which will test their ability to interpret the results of a quantitative research project. Part B will comprise essay questions. Candidates will be expected to do 3 questions from part B.

Candidates will be assessed on understanding of theory and primarily empirical applications, not on the ability to manipulate equations or perform statistical calculations. There may, however, be a few occasions where candidates need or wish to do some very basic, typically just arithmetic, calculations and so calculators are permitted in the examination and you have to provide your own. University guidelines on the specification of calculators apply.

Teaching Arrangements:
The teaching will be a mixture of lectures, classes and tutorials. Students may wish to attend the general statistics lectures by Prof. Catherine de Vries, held on Tuesdays 3-5 in Exam Schools in Michaelmas Term. There will be four two-hour classes for the first four weeks of Michaelmas term that go over the basic statistical theory. These will be practical classes with accompanying reading and exercises. Finally there will be 4 tutorials in Michaelmas term, 2 tutorials in Hilary term and a 2 hour revision class in Trinity Term. The tutorials will build on the work done in the classes and cover a selection of the part B topics.

Class topics (in preparation for part A of the exam):
1. Introduction and overview of key concepts
2. Sampling, hypothesis testing and intro to regression
3. OLS regression and extensions
4. Categorical data and logistic regression
Tutorial topics (in preparation for part B of the exam):

1. Survey sampling and opinion polls
2. Experiments in social science
3. Measuring aspects of democracy
4. Path analysis and causal inference
5. Association between categorical variables
6. Time-Series and public opinion
7. Event history analysis and government duration
8. Selection bias and matching
9. Age, period and cohort effects
10. Contextual effects and multi-level modelling

Items marked with a * are particularly recommended. Library codes are for the Social Science Library in Manor Road.

Background, introductory and general texts:


Topic 1. Survey sampling and opinion polls

Introduction: This topic covers the practical and theoretical considerations involved in the choice of survey and polling methods and how these may affect results. It is important to get an understanding of the potential biases arising from sample selection, differential response rates etc. In light of these considerations, students should be able to evaluate the relative merits of different modes of data collection (face to face, telephone, internet), different sampling techniques (probability vs. quota samples) and different methods (e.g. weighting) to correct for bias when it occurs. You should also be aware of the particular debates of the effects of polling methodologies on opinion polls at recent British general elections.

Background reading:

*Groves, Robert M et al. 2011. Survey Methodology. Hoboken, NJ: Wiley. Chapters 1-9 (you can skip the most technical or detailed bits, focus on the main concepts)

**Questions:**

Q. How might the mode of data collection affect the findings of opinion polls?

Q. What explains the error in the polls at the British General Election of 2010?

**Topic readings:**


**Topic 2: Experiments in Social Science**

**Introduction:** The use of experiments in social science is becoming increasingly common. Advocates of the experimental approach point to the high internal validity of experiments helping researchers to gain a better understanding of causal mechanisms. However, there are worries that experiments have limited usefulness because of their low external validity i.e. their inapplicability to the real world. Students should be able to discuss the pros and cons of experimental research as compared to observational studies, and also the costs and benefits of different experimental designs, especially field and lab experiments. They should demonstrate an awareness of how experiments have been used in social science and what can practically be done to try and maximise both internal and external validity.

**Background Readings:**


**Questions:**

Q: There is no causation without manipulation. Is this right, and what research design implications does it have?

Q: External validity is the Achilles heel of experimentation. Discuss

**Topic Readings:**


**Topic 3: Measuring Aspects of Democracy**

**Introduction:** A major challenge facing social scientists is how to construct suitable measures of complex phenomena, such as democracy, for use in empirical research. The topic covers key issues with measurement, especially validity and reliability, and also the construction of composite measures and the identification of multiple dimensions in multivariate data (by principle components analysis, factor analysis etc.). Debates over the measurement of the level of democracy and also the patterns of democratic institutions (in Lijphart) are used as important examples.

**Background Reading:**


**Questions:**

Q: Is there a coherent way to measure the quality of democracy?

Q: Does Lijphart show us that democracies can differ in at most two ways?

**Topic Readings:**


**Topic 4: Causal Inference, Path Analysis and Instrumental Variables**

**Introduction:** Much social science research aims to identify causal links between variables. This topic focuses on causal modelling of observational, as opposed to experimental data. Whilst it is fairly straightforward to demonstrate association between variables, demonstrating causality is more problematic. It requires, among other things, the elimination of possible alternative causes and correct specification of the direction of the causal link. Path analysis is one technique which can be used to model complex relationships between variables and develop causal theories including appropriate control variables. Students should be aware of the difficulties associated with causal modelling in the social sciences, especially endogeneity and the difficulty of distinguishing cause and effect. They should be familiar with the key principles, benefits and drawbacks of the Neyman-Rubin model, regression discontinuity designs, and the Instrumental Variables (IV) approach to tackling endogeneity.

**Background readings:**


Chapter 10 (Introduction to Multivariate Relationships) and pp.624-629 (Path Analysis). H62.AGR


Questions:
Q. Compare and contrast path analysis, the Neyman-Rubin model, regression discontinuity designs, and the Instrumental Variables (IV) approach to causal inference for observational studies.

Topic readings:
http://esr.oxfordjournals.org/cgi/reprint/17/1/65

Topic 5: Association Between Categorical Variables

Introduction: Social scientists are often interested in tracing changes in the strength of the relationship between two categorical variables, such as social class and vote, over time. The conclusions reached will be sensitive to the measure of association used and, in particular, whether it controls for fluctuating marginals i.e. the possibility that it is the distribution of the variables across different categories, rather than the relationship between them, that is changing over time. Students should be aware of the methodological issues surrounding the measurement of association between categorical variables and be able to demonstrate how the use of alternative techniques, including odds ratios and logistic regression, can affect results. They should do this with reference to existing debates surrounding either the possible decline in class voting or the erosion of class inequalities in education.

Background Reading:

Questions:
Q How has the use of odds ratios changed our understanding of class dealignment?

Topic Reading:
a) Class voting
http://www3.interscience.wiley.com/journal/119472228/abstract

**Topic 6: Time Series Analysis of Public Opinion**

**Introduction:** Public opinion is a key factor in political science; researchers are interested in studying trends in opinion over time and the effect on public opinion of political events. Analysing data over time presents particular challenges for researchers compared with cross-sectional data. Students should gain an awareness of some of the issues involved in analysing time series data including different techniques for modelling the impact of exogenous “shocks” or events. They should be able to discuss these issues with reference to empirical examples.

**Background Reading:**


**Questions:**

Q. How should we model the effect of political events on public opinion?

**Topic Reading:**


**Topic 7: Event History Analysis and Government Duration**

**Introduction:** Often social scientists have the objective of studying how long it takes for a certain event such as the fall of a regime or the collapse of a governing coalition to occur; they are interested not just in whether the event occurs but when. Ordinary regression techniques are unsuitable for studying duration or survival for a number of reasons and specialist event history models have been developed to take account of this. Students should be aware of the methodological issues surrounding the study of duration data and how these are dealt with in event history analysis. They should be able to discuss the advantages of using event history analysis in the context of modelling government duration.
Background Reading:

Questions:
Q. “Students would now be taken out and shot for using simple OLS regressions to analyse cabinet duration” (Laver, 2003). Discuss

Topic Reading:

Topic 8: Selection Bias and matching

Introduction: One of the biggest problems in using statistical techniques in social science is that people are not randomly selected into trial and control groups. Instead, in many cases, people select themselves into various groupings that are of interest. For example, if we are interested in knowing whether alliance ties between two countries affects the probability of escalation to war, we need to take into account both the fact that states choose whether to ally
or not and they can choose whether to avoid getting into a situation where war might erupt. Students should be able to discuss, with reference to empirical examples, the potential problems caused by self selection and possible strategies for dealing with these problems.

**Background:**


**Questions:**

Q. To what extent can selection bias be adequately adjusted for in social research?

**Topic readings:**


**Topic 9: Age, Period and Cohort Effects**

**Introduction:** Generational theories are often cited as the reason for the large age differences that one sees in a variety of socio-political attitudes. Change over time is also often accounted for by the replacement of older generations with newer generations that hold different views. Presenting convincing evidence for these ideas is difficult however due to the inherent under-identifiability of models that attempt to include changes due to age effects, period effects and generational effects. Students should be able to explain this fundamental problem with reference to real examples, and be able to explore the merits of possible ‘solutions’ to these kind of under-identified models.

**Background Reading:**


**Questions**

Q. What is meant by the age-period-cohort identification problem? How successful are the various strategies used to solve it?

**Topic Readings:**


**Topic 10: Contextual Effects and Multi-Level Modelling**

**Introduction:** As well as looking at the behaviour of individual actors, social scientists are interested in contextual effects i.e. effects on individuals’ behaviour which arise from their social interaction within an environment. Multi-level models have developed to enable researchers to separate out and identify the relative importance of individual level and contextual factors in determining behaviour. Students should demonstrate an awareness of both the theoretical importance of contextual effects and the way in which multi level modelling enables reserachers to identify their presence empirically. They should do this with reference to empirical examples taken from research looking at possible contextual effects on vote choice.
Background Reading:


Questions:
Q: How has the availability of techniques for multi-level modelling advanced our understanding of class voting in Britain?

Topic Readings:


